ROCKY MOUNTAIN POWER
A DIVISION OF PACIFICORP

1407 W North Temple, Suite 310
Salt Lake City, Utah 84116

April 27, 2017

VIA ELECTRONIC FILING

Utah Public Service Commission
Heber M. Wells Building, 4th Floor
160 East 300 South
Salt Lake City, UT 84114

Attention: Gary Widerburg
Commission Secretary

RE: Docket No. 16-035-36 - In the Matter of the Application of Rocky Mountain Power to Implement Programs Authorized by the Sustainable Transportation and Energy Plan Act

Pursuant to the Commission's Phase Three Scheduling Order dated February 27, 2017, in the above referenced matter, Rocky Mountain Power hereby submits for filing the rebuttal testimony of Mr. William J. Comeau and Mr. Robert M. Meredith, including exhibits and workpapers supporting the filing.

Rocky Mountain Power respectfully requests that all formal correspondence and requests for additional information regarding this filing be addressed to the following:

By E-mail (preferred): datarequest@pacificorp.com
bob.lively@pacificorp.com
daniel.solander@pacificorp.com

By regular mail: Data Request Response Center
PacifiCorp
825 NE Multnomah, Suite 2000
Portland, OR 97232

Informal inquiries may be directed to Bob Lively at (801) 220-4052.

Sincerely,

Jeffrey K. Larsen
Vice President, Regulation

Rocky Mountain Power
Docket No. 16-035-36
Witness: William J. Comeau

BEFORE THE PUBLIC SERVICE COMMISSION
OF THE STATE OF UTAH

ROCKY MOUNTAIN POWER

Rebuttal Testimony of William J. Comeau

April 2017

Q. Are you the same William J. Comeau who submitted direct testimony in Phase Three of this proceeding on behalf of the Company?

A. Yes.

PURPOSE OF TESTIMONY

Q. What is the purpose of your testimony in this proceeding?

A. The purpose of my rebuttal testimony is to respond to and/or rebut issues regarding the proposed Plug-in Electric Vehicle ("PEV") Program raised by Utah Office of Consumer Services witness Ms. Cheryl Murray, Utah Clean Energy and Southwest Energy Efficiency Project witness Mr. Kevin Emerson, and ChargePoint witness Mr. James Ellis. Specifically, my testimony will address recommended changes to the proposed Schedule 120, outreach and education concerns, and future adjustments to annual incentive caps raised by Ms. Murray, incentive offering and budget recommendations raised by Mr. Emerson, and eligible equipment qualifications raised by Mr. Ellis. Company witness Mr. Robert M. Meredith is submitting rebuttal testimony to respond to parties regarding the residential time-of-use pilot, Schedule 2E.

SCHEDULE 120 REVISIONS

Q. Ms. Murray suggests minor language modifications to Schedule 120. Does the Company agree with some of these suggestions?

A. Yes, the Company agrees with three of the four suggestions. Ms. Murray suggests the following changes be made to Schedule 120:

a) Revise the title of Table 1 in Sheet 120.1 to better capture the range of measures eligible for incentives;

b) Revise Special Conditions 2 and 4 under Non-Residential AC Level 2 Charger and DC Fast Charger, respectively, to clarify incentives will be available on a first come first served basis;

c) Revise Footnote 1 on Sheet 120.1 to clarify time of use load research participants “are eligible” rather than “may be eligible” for a separate $200 payment; and

d) Split the $200 incentive for time of use participants in Schedule 2E with $100 paid upon signing up and $100 paid upon completion of the customer survey.

The Company agrees with modifications a, b, and c above and has included revisions to Sheet Nos. 120.1 and 120.2 to address them and other modifications, attached as Exhibit RMP___(WJC-1R). It should be noted that Footnote 1 has been removed from Sheet 120.1 and instead been incorporated under the Time of Use Rate Special Conditions on Sheet 120.2. The Company believes that modification d is an unnecessary complication. Splitting the incentive as Ms. Murray suggests will create additional administrative costs to track when each participant enrolls in time of use rates on Schedule 2E and when the same participant completes the customer survey. It may also create confusion and require additional customer outreach materials to adequately explain how and when participants will receive incentive payments. The Company believes simplifying the process will result in greater participation, and also expects to obtain enough customer surveys to be statistically relevant without allocating incentive funds to that end.

OUTREACH AND EDUCATION & ANNUAL INCENTIVE CAPS

Q. Ms. Murray suggests the minimum $100,000 allocated to outreach and education, as part of the $500,000 overall administrative budget, may be inadequate to launch a successful outreach and education campaign. Does the Company share this concern?

A. No. The proposed budget takes into consideration that the first program year (2017) consists of only 6 months, assuming a program start date of July 1, 2017. Based on our experience launching new programs, the Company believes $500,000, which is 25 percent of the total annual budget, is sufficient to successfully launch the PEV Program. Actual spend for outreach and education is dependent on the results of the Program Administrator Request for Proposals and final contract, but will not be less than $100,000.

Q. Ms. Murray suggests that additional technical conferences be required of the Company to provide specific information regarding its outreach and education plans as they are developed. Does the Company agree with this suggestion?

A. No. The Company believes mandatory technical conferences for outreach and education are not needed for a successful 2017 launch of the PEV Program. The Company will provide annual reports documenting the results of the PEV Program, including marketing efforts, the first of which will be provided the first part of 2018. The annual report will include improvements needed for the PEV Program, including marketing and outreach. If unforeseen issues occur that will prevent the PEV Program from being successful we will meet with stakeholders and file with the Commission,

as needed. In addition, the Company will respond to any stakeholder request for an update on current marketing efforts and materials.

Q. Does the Company have a strategy for marketing and outreach?

A. Yes. Marketing and outreach during the first two years will include:

- A targeted approach to reach the approximate 2,500 PEV owners in Utah to:
    1. Obtain participation in the TOU Pilot;
    2. Obtain participation in the TOU Load Research Study; and
    3. Educate all PEV owners on the need to charge during off-peak time periods for the purpose of changing their behavior to charge during off-peak.
- A robust online resource website to provide customers information about electric vehicles and benefits of charging during off-peak times.
- Scoping the benefits and cost of an online app for PEV owners. The main purpose would be to facilitate charging behavior during off-peak times.
- Direct business marketing to create awareness for the PEV charging infrastructure incentives, with a focus on obtaining participation in the PEV Program.

The strategy for future years will be driven from the lessons learned and the evolving needs of the PEV Program and customers.

INCENTIVE OFFERINGS AND BUDGET

Q. Mr. Emerson recommends that the Company reallocate $50,000 from the Grant-Based Custom Projects and Partnerships category to a new Residential Level 2 EV Charger incentive category, with the incentive set at $500 per charger. Does the Company agree with this recommendation?

A. No. The Company believes it is more beneficial to promote participation in time of use rates to incentivize PEV charging during off-peak periods than to incentive residential AC Level 2 chargers. Customers may choose to use the incentive they receive from participating in time of use rates towards the purchase of an AC Level 2 charger.

Q. Mr. Emerson recommends increasing the incentive cap for Non-Residential Level 2 chargers to $4,000 for single port, and $7,000 for dual port stations. Does the Company agree with this recommendation?

A. Yes. As shown in Exhibit RMP___(WJC-1R), Table 1 has been modified to include separate incentives for single and multi-port chargers. The maximum up to amounts for Non-Residential AC Level 2 Chargers have been increased to $4,000 per single port and $7,000 per multi-port, up to 75 percent of total charger cost, as recommended by Mr. Emerson. The initially offered amount the Company will provide for single port chargers will be increased to $2,500, and $3,500 for multi-port chargers. If these incentive amounts need to be adjusted based on participation levels, the Company will do so through a 45-day notice posted to its website.

Q. Mr. Emerson recommends increasing the incentive cap for DC Fast Chargers to $45,000. Does the Company agree with this recommendation?

A. Yes. Similar to Non-Residential AC Level 2 Chargers, and as shown in Exhibit RMP___(WJC-1R), DC Fast Chargers have been defined by single vs. multi-port. The single port maximum incentive has been increased to $45,000 and multi-port maximum incentive has been set at $63,000, up to 75 percent of total charger and installation costs. The initially offered incentive amount for single port chargers will be increased to $30,000, and $42,000 for multi-port chargers. If these incentive amounts need to be adjusted based on participation levels and budgets, the Company will do so through a 45-day notice posted to its website.

Q. Mr. Emerson recommends breaking out a separate multi-family offering with higher incentive offerings than the Non-Residential AC Level 2 Charger offering. Does the Company agree with this recommendation?

A. No. The multi-family sector is adequately addressed by being allowed to participate in all the Non-Residential offerings, such as AC Level 2, DC Fast Chargers, and Grant-based Custom Project offerings.

Q. Mr. Emerson expresses concerns about re-allocating unused funds after September 30th into the Grant-based Custom Projects and Partnerships category, only allowing for 3 months in the first year of the PEV Program to provide the full spectrum of offerings, assuming an effective date of July 1, 2017. Does the Company share these concerns?

A. No. To clarify, after September 30th each year, the Non-Residential AC Level 2 and DC Fast Charger incentives will still be available to customers, but the funds at that point

will be part of the subsequent year's budget. For example, as of October 1, 2017, all applications received for Non-Residential AC Level 2 and DC Fast Chargers going forward will be counted towards the budget for 2018. In essence, the PEV Program prescriptive incentives budget will follow an October 1st through September 30th program year, while Grant-based custom projects and partnerships will follow a January 1st through December 31st program year. Accounting for the PEV Program in this manner will help ensure funding for the PEV Program is used efficiently, and avoid the unnecessary loss of funds due to the use-it-or-lose-it nature of the PEV Program's funding.

Q. Mr. Ellis recommended eliminating the fund re-allocation after September 30th each year, and instead rolling over remaining funds to the same budget category in the following year. Does the Company agree with this recommendation?

A. No. Funds allocated to the PEV Program are on an annual use-it-or-lose-it basis. The PEV Program may spend up to $2 million per year, with any remaining funds being forfeited and ineligible to be rolled over to the subsequent calendar year. The purpose of the fund re-allocation is to use funds efficiently.

Q. Mr. Emerson provides an alternative proposal to Table 1 from your direct testimony. Does the Company agree with the alternative proposal?

A. No. Due to the limited budget for the PEV Program, the Company believes the overall package for the PEV Program, including Table 1 below, is consistent with U.C.A. §54-20-103(1), promoting customer choice in electric vehicle charging equipment and provides all eligible customers an option for incentives.

Table 1 - Annual Incentive Caps and Estimated 2017 Budget

PEV Program Year	Incentive Measure	Annual Incentive Caps	Administrative/Outreach & Awareness Costs	Total
2017	Time of Use Pilot	$200,000*	Up to $500,000*	
	Non-Residential AC	$400,000*		
	DC Fast Chargers	$400,000*		
	Grant-based custom	$500,000**		
Total		$1,500,000	$500,000	$2,000,000

*This is the maximum amount of funds that may be spent annually. A minimum of $100,000 will be allocated to outreach and awareness.

**After September 30th each year, any remaining funds below the maximum annual spending limits identified in Table 1 above, may be re-allocated at the Company's discretion based on participation to Grant-based custom projects and partnerships, increasing its incentive cap for the calendar year.

Q. Mr. Emerson recommends that chargers receiving incentives through the PEV Program meet all industry-accepted standards for EV charger safety and performance, published by entities such as Underwriters Laboratories. Does the Company agree with this recommendation?

A. Yes. The Company intends to require all electric vehicle charging equipment to be UL certified. As PEV charging technology and standards evolve, the Company will adjust standards, as appropriate.

ELIGIBLE EQUIPMENT QUALIFICATIONS

Q. Mr. Ellis recommends the PEV Program only incentivize charging stations that can communicate to provide data and load management tools. Does the Company agree with this recommendation?

A. No. If the PEV Program only incentivized communicating chargers we would not be promoting customer choice with plug-in electric vehicle charging infrastructure. The Company believes both communicating and non-communicating Level 2 chargers are part of the overall electric vehicle charging infrastructure solution. As noted in the

proposed Schedule 120, projects receiving incentives for DC fast chargers and custom projects will be required to provide the Company access to charging data.

Q. Mr. Ellis recommends the Company be required to work with the electric vehicle supply equipment (“EVSE") industry and other stakeholders on the development of a common qualification framework. Does the Company agree with this recommendation?

A. No. The Company is in the process of finalizing the PEV Program administrator request-for-proposal. The PEV Program administrator will be an EVSE expert and will be responsible for continually improving the PEV Program to ensure program targets are being met, which includes consulting with the electric vehicle industry.

Q. Does the Company have any other revisions or recommendations at this time for the PEV Program other than those described in this rebuttal testimony?

A. No.

Q. Does this conclude your rebuttal testimony?

A. Yes.

Rocky Mountain Power
Exhibit RMP___(WJC-1R)
Docket No. 16-035-36
Witness: William J. Comeau

BEFORE THE PUBLIC SERVICE COMMISSION
OF THE STATE OF UTAH

ROCKY MOUNTAIN POWER

Exhibit Accompanying Rebuttal Testimony of William J. Comeau

Schedule 120 New Plug-in Electric Vehicle Pilot Tariff

April 2017

ROCKY MOUNTAIN POWER
A DIVISION OF PACIFICORP

P.S.C.U. No. 50 **Original Sheet No. 120.1**

ROCKY MOUNTAIN POWER

ELECTRIC SERVICE SCHEDULE NO. 120

STATE OF UTAH

Plug-in Electric Vehicle Incentive Pilot Program

PURPOSE: This Schedule is intended to promote plug-in electric vehicle charging infrastructure and Time of Use (TOU) rates.

APPLICABLE: To Rocky Mountain Power and all Customers taking service under the Company's General Service Schedules 1, 2, 2E, 3, 6, 6A, 6B, 7, 8, 9, 9A, 10, 11, 12, 15, 21, 23, 31, and 32.

CUSTOMER PARTICIPATION: Customer participation is voluntary and is initiated by following the participation procedures on the Company website. The Company shall have the right to qualify participants, at its discretion, based on criteria the Company considers necessary to ensure the effective operation of the measures, utility system, and program budget. Program details, requirements, and current incentive levels can be viewed on the Company's website at www.rockymountainpower.net/pev.

Table 1 – Plug-in Electric Vehicle (PEV) Program Offerings

Category	Measure		Incentives "up to"
Time of Use Pilot Program	Participation in Time of Use Rate in Electric Service Schedule 2E		$200 per customer
Plug-in Electric Vehicle Charging Stations	Non-Residential AC Level 2 Charger	Single Port	$4,000 per charger up to 75% of total charger cost
		Multi-Port	$7,000 per charger up to 75% of total charger cost
	DC Fast Charger	Single Port	$45,000 per charger up to 75% of total charger and installation costs
		Multi-Port	$63,000 per charger up to 75% of total charger and installation costs
	Grant-based custom projects and partnerships		Custom

(continued)

ROCKY MOUNTAIN POWER
A DIVISION OF PACIFICORP

P.S.C.U. No. 50 **Original Sheet No. 120.2**

ELECTRIC SERVICE SCHEDULE NO. 120 – Continued

AVAILABILITY: Availability for incentives listed in Table 1 above is subject to available funds. Availability of funds will be listed on the Company website and updated on a monthly basis.

SPECIAL CONDITIONS:

Time of Use Rate:

1. Eligibility criteria for participation may include, but is not limited to:
    a. Customers must meet all participation requirements and special conditions established in Electric Service Schedule 2E.
2. Participation incentives for Electric Service Schedule 2E will be provided to customers shortly after enrollment.
3. Participants in the Time of Use Load Research Study are eligible for an additional incentive payment, as specified in Electric Service Schedule 121.

Non-Residential AC Level 2 Charger Prescriptive Incentive:

1. To be eligible for an incentive, Customers must submit a Program Administrator approved post-purchase application and meet all Program requirements.
2. Incentives will be available on a first come first served basis with an annual cap.
3. The Company and its agents reserve the right to inspect installations.

DC Fast Charger Prescriptive Incentive:

1. To be eligible for an incentive, Customers must submit a Program Administrator approved application(s), provide all required documentation, and receive pre-approval.
2. Equipment purchased or installed prior to receipt of the Company's pre-approval may not be eligible for incentives.
3. Pre-approval criteria may include, but is not limited to:
    a. Location variables such as proximity to other DC Fast Chargers;
    b. Overall benefits to the public;
    c. Costs of project and incentive amount;
    d. Technology being used;
    e. Consent to provide charger usage data;
    f. Availability to the public; and
    g. Number of chargers and per project caps.
4. Incentives will be available on a first come first served basis with an annual cap.
5. The Company and its agents reserve the right to inspect installations.

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ROCKY MOUNTAIN POWER
A DIVISION OF PACIFICORP

P.S.C.U. No. 50 **Original Sheet No. 120.1**

ROCKY MOUNTAIN POWER

ELECTRIC SERVICE SCHEDULE NO. 120

STATE OF UTAH

Plug-in Electric Vehicle Incentive Pilot Program

PURPOSE: This Schedule is intended to promote plug-in electric vehicle charging infrastructure and Time of Use (TOU) rates.

APPLICABLE: To Rocky Mountain Power and all Customers taking service under the Company's General Service Schedules 1, 2, 2E, 3, 6, 6A, 6B, 7, 8, 9, 9A, 10, 11, 12, 15, 21, 23, 31, and 32.

CUSTOMER PARTICIPATION: Customer participation is voluntary and is initiated by following the participation procedures on the Company website. The Company shall have the right to qualify participants, at its discretion, based on criteria the Company considers necessary to ensure the effective operation of the measures, utility system, and program budget. Program details, requirements, and current incentive levels can be viewed on the Company's website at www.rockymountainpower.net/pev.

Table 1 – Plug-in Electric Vehicle (PEV) Program ~~Infrastructure~~ Offerings

Category	Measure		Incentives "up to"
Time of Use Pilot Program[1]	Participation in Time of Use Rate in Electric Service Schedule 2E		$200 per customer
Plug-in Electric Vehicle Charging Stations	Non-Residential AC Level 2 Charger	Single Port	$~~4~~3,000 per charger up to 75% of total charger cost
		Multi-Port	$7,000 per charger up to 75% of total charger cost
	DC Fast Charger	Single Port	$~~45~~30,000 per charger up to 75% of total charger and installation costs
		Multi-Port	$63,000 per charger up to 75% of total charger and installation costs
	Grant-based custom projects and partnerships		Custom

[1] ~~See Electric Service Schedule 2E. TOU load research participants may be eligible for a separate $200 incentive per customer.~~

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ROCKY MOUNTAIN POWER
A DIVISION OF PACIFICORP

P.S.C.U. No. 50 **Original Sheet No. 120.2**

ELECTRIC SERVICE SCHEDULE NO. 120 – Continued

AVAILABILITY: Availability for incentives listed in Table 1 above is subject to available funds. Availability of funds will be listed on the Company website and updated on a monthly basis.

SPECIAL CONDITIONS:

Time of Use Rate:

1. Eligibility criteria for participation may include, but is not limited to:
    a. Customers must meet all participation requirements and special conditions established in Electric Service Schedule 2E.
2. Participation incentives for Electric Service Schedule 2E will be provided to customers shortly after enrollment.
3. Participants in the Time of Use Load Research Study are eligible for an additional incentive payment, as specified in Electric Service Schedule 121.

Non-Residential AC Level 2 Charger Prescriptive Incentive:

1. To be eligible for an incentive, Customers must submit a Program Administrator approved post-purchase application and meet all Program requirements.
2. Incentives will be available on a first come first served basis with an annual cap.
3. The Company and its agents reserve the right to inspect installations.

DC Fast Charger Prescriptive Incentive:

1. To be eligible for an incentive, Customers must submit a Program Administrator approved application(s), provide all required documentation, and receive pre-approval.
2. Equipment purchased or installed prior to receipt of the Company's pre-approval may not be eligible for incentives.
3. Pre-approval criteria may include, but is not limited to:
    a. Location variables such as proximity to other DC Fast Chargers;
    b. Overall benefits to the public;
    c. Costs of project and incentive amount;
    d. Technology being used;
    e. Consent to provide charger usage data;
    f. Availability to the public; and
    g. Number of chargers and per project caps.
4. Incentives will be available on a first come first served basis with an annual cap.
5. The Company and its agents reserve the right to inspect installations.

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Rocky Mountain Power
Docket No. 16-035-36
Witness: Robert M. Meredith

BEFORE THE PUBLIC SERVICE COMMISSION
OF THE STATE OF UTAH

ROCKY MOUNTAIN POWER

Rebuttal Testimony of Robert M. Meredith

April 2017

Q. Are you the same Robert M. Meredith that presented direct testimony in phase III of this proceeding?

A. Yes.

PURPOSE OF REBUTTAL TESTIMONY

Q. What is the purpose of your rebuttal testimony?

A. The purpose of my rebuttal testimony is to further support the rate structure and design of the Company's proposed EV TOU Pilot and respond to the testimony of Division of Public Utilities "(DPU)" witness Mr. Robert A. Davis, Office of Consumer Services "(OCS)" witnesses Mr. James W. Daniel, Mr. Jacob Thomas and Ms. Cheryl Murray, Utah Clean Energy "(UCE)" witness Ms. Sarah Wright, Western Resource Advocates "(WRA)" witness Mr. Kenneth L. Wilson, and ChargePoint, Inc. "(ChargePoint)" witness Mr. James Ellis.

GENERAL DISCUSSION OF EV TOU PILOT

Q. What is your general reaction to the phase III direct testimony of other parties?

A. I think that the workshops to discuss the legislative requirement for "time of use pricing for electric vehicle charging" were useful in building consensus around many of the elements surrounding the Company's proposed EV TOU Pilot, except rate design. During the workshops, the topic of the actual rate designs that should be included in a pilot prompted the most discussion. Achieving consensus on which rates to include in the pilot seems to be as elusive now as it was during the workshops.

During the workshops, many different rate designs were explored, with pros and cons to each. The range of different options discussed reflected the diversity and unique perspectives of the stakeholders. Designing rates is a balancing act which must

take into consideration many different and often conflicting goals. What the Company ultimately filed does not necessarily reflect what the Company's most preferred rate options would have been absent the discussions at the workshops. I think that the Company's proposed Option 1 and Option 2 rates, which include both a moderate on- to off-peak energy price differential and a more elevated on- to off-peak energy price differential, best balance different parties' perspectives, while testing rate options that are sufficiently different enough from each other and from the Company's existing residential time-of-use tariff, Schedule 2, that useful information will be learned. Ultimately, the purpose of a pilot is to test a program's feasibility, effectiveness, and acceptance in order to develop an offering that can be more broadly rolled-out to provide longer-term benefits. In this case, the pilot is intended to test customer responsiveness to time-of-use rates to encourage electric vehicle owners to charge their vehicles to off-peak hours.

REBUTTAL OF MR. ROBERT A. DAVIS

Q. To what aspects of DPU witness Mr. Davis' direct phase III testimony are you responding?

A. I address the following in Mr. Davis' phase III direct testimony:

1. Mr. Davis' recommendation to reject the Company's proposed Schedule 2E, because of his misgivings with the Company's proposed rate design.
2. The DPU's concern that the Annual Guarantee Payment may undermine the integrity of the load research study.
3. His request for clarity on the accounting treatment of the cost of meters for the proposed EV TOU Pilot.

4. A discrepancy in my Exhibit RMP___(RMM-5), which Mr. Davis identified.

Q. Why does Mr. Davis recommend rejection of proposed Schedule 2E?

A. While Mr. Davis seems to generally agree with the other features of the Company's proposed EV TOU Pilot's general design, he expresses concerns with the actual design for the two rate options which the Company proposed for the pilot.[1]

Q. What are Mr. Davis' chief concerns with the Company's proposed rate design options?

A. While it is somewhat unclear to me what his exact reservations with the Company's proposed rates are, his concerns appear to be that: 1) Option 1 and 2 may not be different enough for lessons to be learned about customer behavior;[2] 2) The on-/off-peak price ratio of about 3:1 on Option 1 is too small and may not induce behavioral changes[3] and; 3) The on-/off-peak price ratio of about 10:1 on Option 2 is too large and may be punitive to customers who may not be able to shift their household usage.[4]

Q. Does Mr. Davis offer a specific alternative to the Company's proposed rates?

A. No. Mr. Davis suggests that maybe a rate with a 4:1 or 5:1 on-/off-peak price ratio could be used along with maybe using some other unspecified party's rate design that the DPU would evaluate for rebuttal or surrebuttal testimony.[5]

Q. What reasons does Mr. Davis present for rejecting the Company's proposed rates?

A. Mr. Davis' three reasons for rejecting the Company's two proposed rate options seem somewhat inconsistent. Mr. Davis suspects, but expresses uncertainty about whether

[1] See lines 67 through 72 of DPU witness Mr. Robert A. Davis' Direct Testimony.
[2] See lines 94 through 100 of DPU witness Mr. Robert A. Davis' Direct Testimony.
[3] See lines 101 through 110 of DPU witness Mr. Robert A. Davis' Direct Testimony.
[4] See lines 111 through 113 of DPU witness Mr. Robert A. Davis' Direct Testimony.
[5] See lines 115 through 121 of DPU witness Mr. Robert A. Davis' Direct Testimony.

the on-/off-peak price ratio of Option 1 may be too small of a differential for customers to respond. Mr. Davis also suspects, but expresses uncertainty about whether the on-/off-peak price ratio of Option 2 may be so large that customers will be overly penalized. Although he describes price responsiveness and potential impacts to customers as important considerations which he feels are not well understood with the two proposed rate options, he is concerned that not enough useful information would be learned from them.

To me, it is also unclear how Option 1 or Option 2 may induce changes in customer behavior or what the customer acceptance of the two options may be. It is this uncertainty that makes me believe that testing these particular rate designs in the EV TOU Pilot would be keenly insightful. Perhaps, the on-/off-peak price ratio is too small on Option 1 and perhaps too large on Option 2. The Company proposed these two options, whose differences in price for energy consumed during the on- and off-peak periods represent two different extremes, precisely because they would be instructive and lead to a better understanding of the impact of price differential.

Q. While generally agreeing that the Company's proposed Annual Guarantee Payment should be included in the pilot's design, Mr. Davis expresses concern that it may prevent customers from changing the timing of their consumption habits.[6] Please respond to this concern.

A. As I mentioned in my direct testimony, I think that the Company's proposed Annual Guarantee Payment is needed to persuade customers to enroll in the pilot. While in theory the Annual Guarantee Payment could keep some customers from responding to

[6] See lines 67 through 72 of DPU witness Mr. Robert A. Davis' Direct Testimony.

the time-based price signals, I do not think that this would have a significant impact to participants' behavior during their first year after enrollment. Customers would still face an annual consequence of up to an increase of ten percent in their energy charges, if they did not adequately manage the timing of their energy consumption. They would also have the upside potential of saving on their bills if they were successful in shifting enough usage to the off-peak period. Furthermore, it is important to note that the Annual Guarantee Payment is a lump sum *annual* payment made after the first 12 months on proposed Schedule 2E. Customers would still see and need to pay their bills on a monthly basis. I believe that experiencing a large monthly bill, or the potential to experience a large monthly bill, will still encourage customers to respond to the price signals of the tariff, even if there may be some relief after the end of the first year of participation.

Q. Mr. Davis expresses uncertainty regarding the accounting treatment of the costs of meters for the proposed EV TOU Pilot.[7] Please describe the accounting for the cost of meters.

A. The cost to install meters necessary for the EV TOU Pilot will be recovered from STEP funds and will be a part of the cost and budget for electric vehicle incentives. Mr. Davis states that the cost of meters may need to be included in the budget for Conservation, Efficiency and Other New Technology Programs. I do not think that this is necessary, because the meters are needed for the Time of Use Pilot Program incentive described in Mr. Comeau's direct testimony and are therefore a necessary element of the budget for electric vehicle incentives.

[7] See lines 201 through 212 of DPU witness Mr. Robert A. Davis' Direct Testimony.

Concerning the accounting of the meter costs, the capital spend for the meters will be offset by contributions in aid of construction "(CIAC)" from STEP funds. While the labor and materials cost of installing a meter is capitalized, the Company will not earn a return on or depreciate the meters, since the costs will be eliminated by the STEP funds' CIAC.

Q. Mr. Davis notes that for the incremental cost to charge a plug-in electric vehicle "(PEV)" shown on Exhibit RMP___(RMM-5), Schedule 2 and proposed Schedule 2E do not include various surcharges. Please respond.

A. When preparing Exhibit RMP___(RMM-5), the Company inadvertently left off Schedule 94 and Schedule 98 adjustments to the energy charges for proposed Schedule 2E. Please refer to Revised Exhibit RMP___(RMM-5) which corrects this issue. Exhibit RMP___(RMM-5) presents estimates of the incremental cost to charge a PEV and therefore Schedule 91, which is a fixed monthly surcharge, is not relevant to this calculation. Also, Schedule 2's surcharge for on-peak energy and credit for off-peak energy are adders to Schedule 1 and are not subject to Schedule 94 and 98. The "fuel" comparison presented in Exhibit RMP___(RMM-5) is therefore accurate for Schedule 2.

Q. What is the change in the estimated "fuel" savings for proposed Schedule 2E presented in Revised Exhibit RMP___(RMM-5) relative to what you presented in direct testimony?

A. The change is relatively minor. The estimated monthly "fuel" savings shown on Revised Exhibit RMP___(RMM-5) for TOU Option 1 is $46.62, or $0.27 per month less than presented in my direct testimony. For TOU Option 2, the estimated monthly

"fuel" savings was corrected to be $59.05, or $0.14 per month less than presented in my direct testimony.

Q. Does this correction impact the prices calculated for proposed Schedule 2E?

A. No. The Company's estimates for the incremental cost to "fuel" PEV's and internal combustion vehicles "(ICE)" were provided in my direct testimony for informational purposes and do not influence the calculation of the actual prices.

REBUTTAL OF MR. JAMES W. DANIEL

Q. Please summarize OCS witness Mr. Daniel's concerns with the Company's proposed rates for the EV TOU Pilot.

A. Mr. Daniel feels that the on-peak energy charge for Option 2 is too large and the time periods for the on-peak period contain too many hours.[8] Mr. Daniel argues that Option 2 is problematic, because a customer who shifts a significant level of energy consumption to the off-peak period could avoid paying distribution-related costs which could shift those costs to other customers.[9]

Q. Would the Company's Option 2 cause distribution costs to be shifted to non-participating customers?

A. It is unclear to me whether either of the Company's rate options for the pilot would shift costs to non-participants. The issue of potential cost shifting and the degree to which customers participating in the different rate designs for the EV TOU Pilot are fully covering their costs may be perhaps the most important aspect to examine in this pilot. I do not think that the Company's proposed rate options would necessarily create

[8] See lines 65 through 70 of OCS witness Mr. James W. Daniel's Direct Testimony.
[9] See lines 146 through 156 of OCS witness Mr. James W. Daniel's Direct Testimony.

a cost shifting situation, since both options are guided by the Company's cost of service study from the last general rate case.

The margin by which the on-peak energy charge exceeds the off-peak energy charge for Option 2 was designed to recover all costs that are not energy-related and are not recovered by the customer charge.[10] In other words, the on-peak energy charge for Option 2 was primarily designed to recover those costs that are demand related. Costs that are allocated on the basis of demand in the last general rate case made up approximately 60 percent of the residential class' cost of service. In comparison, the premium for the on-peak energy charge over the off-peak energy charge for Option 2 recovers about 61 percent of residential revenue requirement. Since the on-peak energy charge premium from Option 2 was designed to recover demand-related costs, which make up most of the residential class' cost of service, the on-peak period was set to include the vast majority of both system coincident peaks and distribution coincident peaks.[11]

While both the rates and the time-of-use periods are strongly aligned with the Company's cost of service study, it is not entirely clear that a customer's time-based volumetric usage in response to time-of-use prices will correspond with that customer's demand at the times of the Company's peaks. If the Commission approves the Company's proposed rates and load research study plan, I think that this important question could be answered.

I think that it is quite possible that analysis at the pilot's conclusion could show that customers on the Company's proposed rates could pay quite close to their cost of

[10] See lines 295 through 301 of Company witness Mr. Robert M. Meredith's Direct Testimony.
[11] See lines 227 through 239 of Company witness Mr. Robert M. Meredith's Direct Testimony.

service, since those rates were guided by the cost of service study. I also think that it is possible that analysis could show that they do not fully cover their costs creating potential cost shifting. In consideration of this uncertainty surrounding the potential for cost shifting, the Company's proposal for time-of-use pricing for PEV drivers is for a limited five year pilot which will at most include about 1,200 customers. The Company's expectation is that the proposed EV TOU Pilot, if approved by the Commission, would shed some light on this issue before any TOU option would be more broadly implemented.

Q. Mr. Daniel indicates that the Company "arbitrarily" set Option 1's off-peak energy charge halfway between the average energy charge for residential customers and the off-peak charge for Option 2.[12] Were the rates for Option 1 set arbitrarily?

A. No. Given the uncertainty I just described regarding the effectiveness of volumetric time-based rates to adequately capture cost, it was important for another rate option to be developed from which all variables, except one, were kept constant. Option 1 was therefore designed to be identical to Option 2 in all ways, except for having a smaller on- to off-peak energy charge price differential. The rates resulting from using halfway between average energy charges and Option 2's rates produces prices that are sufficiently different from both Option 2 and present Schedule 2, such that meaningful information could be obtained from testing and studying them.

[12] See lines 141 through 143 of OCS witness Mr. James W. Daniel's Direct Testimony.

Q. Does Mr. Daniel present alternative rates for the two options for the EV TOU Pilot?

A. Yes. Mr. Daniel recommends a rate option 1 with an approximately 2:1 on-/off-peak price differential "(OCS Option 1)" as well as another rate option 2 with an approximately 4:1 on-/off-peak price differential "(OCS Option 2)."[13]

Q. What is your opinion of Mr. Daniel's proposed rates?

A. Relative to the Company's proposed prices, the on- to off-peak energy price differentials of the rate options presented by Mr. Daniel are significantly closer together. I also note that the on- to off-peak energy price differential for OCS Option 1 is about 2:1, which is fairly close to the differential of the Company's existing Schedule 2 tariff. Given the similarities between OCS Option 1 and OCS Option 2 as well as OCS Option 1 and Schedule 2, I think the information that could be learned from the pilot would be less useful, if the Commission were to approve Mr. Daniel's proposed prices instead of those proposed by the Company.

Q. Does Mr. Daniel present alternative on-peak time periods for the EV TOU Pilot?

A. Yes. Mr. Daniel also recommends a slight modification to the hours of the on-peak period for OCS Option 1 such that the winter morning non-holiday weekday on-peak hours include only 8am to 9am instead of the Company's proposed 8am to 10am period, and the non-holiday weekday late afternoon/early evening on-peak hours are shortened to three hours and staggered one hour apart (5pm to 8pm in the winter and 4 to 7pm in the summer as compared to the Company's proposed 3pm to 8pm).[14]

[13] See lines 164 through 177 of OCS witness Mr. James W. Daniel's Direct Testimony.
[14] See lines 204 through 232 of OCS witness Mr. James W. Daniel's Direct Testimony.

Q. What is your opinion of Mr. Daniel's proposed on-peak period for OCS Option 1?

A. The on-peak period which Mr. Daniel selected for OCS Option 1, while shorter and less restrictive from a customer perspective, captures a smaller percentage of the system coincident and distribution system coincident peaks. While the Company's on-peak period includes 94 percent of the peaks that occurred in the past five filed cost of service studies, the on-peak period that Mr. Daniel proposes for OCS Option 1 would only include 80 percent of those same peaks in the summer period and 83 percent in the winter period. The Company selected the hours which it did so that the on-peak period would include the timing for almost all of the Company's potential peaks with the hope that energy shifted away from on-peak hours would result in demand reductions at the time of the Company's peaks.

Also, varying the time-of-use periods as well as the on- and off-peak energy price differentials would make it more challenging for useful information to be learned from the pilot. As I indicated earlier in my testimony, I think that whichever two rate options are included in the pilot should be the same in all respects except for one useful variable which could be studied. If OCS Option 1 and OCS Option 2 were to be used for the pilot, it may be impossible to accurately parse out the impacts from price differential versus time-of-use period. Furthermore, I believe that price differential is a more important variable to test, since the Company's proposed time of use periods accurately reflect the times of the Company's peak periods and price may be more impactful than a subtle change in the hours.

Q. Mr. Daniel recommends that the Company's final report for the EV TOU Pilot include several particular analyses.[15] Does the Company agree to include these analyses in its final report?

A. Yes. The analyses that Mr. Daniel references would be useful and the Company agrees to include them in its final report.

Q. Mr. Daniel recommends that the Company's proposed Annual Guarantee Payment be limited to a period less than 12 months. Does he provide any support for this recommendation?

A. No. Mr. Daniel simply recommends that the proposed Annual Guarantee Payment should be limited to some unspecified period that would be less than the proposed 12 months without providing any reasoning for his suggestion.[16]

Q. Why is an annual period for a guarantee payment a good length of time?

A. For many customers, their usage patterns fluctuate over the different months of a year. They may use electricity to either cool or heat their home and consequently the timing of their electric consumption may be quite different in July than it is in March. For PEV drivers, who this pilot is specifically targeted towards, the number of miles driven on their PEV's may also vary significantly during the different months of a year. If the guarantee payment did not cover a full annual period, it would be challenging for customers to know if participating in the EV TOU Pilot would be a good choice for them. Any period less than a year may not include the full range of end-uses for which a customer uses electricity. Furthermore, the seasonality of a customer's hourly energy consumption may make it more or less challenging to effectively shift usage to the off-

[15] See lines 261 through 269 of OCS witness Mr. James W. Daniel's Direct Testimony.
[16] See lines 278 through 279 of OCS witness Mr. James W. Daniel's Direct Testimony.

peak period during different months. I believe that providing participants with a guarantee that covers a full year will be an important tool for signing up participants who might otherwise be on the fence about time-of-use rates. Accordingly, the Company recommends that the Commission adopt the Company's proposal for the guarantee payment to cover one year.

REBUTTAL OF MR. JACOB THOMAS

Q. How does OCS witness Mr. Thomas recommend the Company modify the design of its proposed load research study?

A. Along with the Company's proposed approach of stratifying customers with PEVs on the basis of energy usage, Mr. Thomas recommends another dimension of stratification be included which would consider the type of PEV charging that a sample customer uses. Mr. Thomas recommends including the variable of whether a customer uses a Level 1 or a Level 2[17] PEV charger in the design of the load research study.

Q. Why does Mr. Thomas recommend this change to the Company's proposed load research study?

A. Mr. Thomas reasons that the underlying electric characteristics of different chargers would likely have different usage patterns.[18] He further describes how stratifying upon energy usage alone may not fully correct for the differences in load profile for customers with different PEV charger types, since residential customers have a variety of different end-uses for their household consumption. For example, a customer with central air conditioning and a Level 1 charger that uses less overall energy on PEV

[17] A Level 1 PEV charger is connected to a standard 120 volt household outlet and supplies a slower charge that draws less power. A Level 2 PEV charger is connected to a 240 volt circuit, which are commonly used to supply power to an oven or a clothes dryer, and charges faster with a greater draw of power.

[18] See lines 152 through 170 of OCS witness Mr. Jacob Thomas' Direct Testimony.

charging and a customer with a swamp cooler and a Level 2 charger that uses more energy on PEV charging may have similar overall energy consumption but very different hourly profiles.[19]

Q. Do you agree with Mr. Thomas' recommended changes?

A. No. I respectfully think that his recommended changes are unnecessary to achieve the goal of a load research study that is robust and accurate, and could overly complicate the process of recruiting participants for the load research study.

Q. Please describe why you believe that stratifying based upon charger type is unnecessary.

A. The Company has several load research studies in place for different rate classes such as residential, irrigation, and small general service. Within each of these rate classes, there can be a wide range of end-uses that are present within each sample customer's electric consumption. Like Mr. Thomas referenced, some residential customers have central air conditioning and some do not. It has never been the practice of the Company to try and determine which customers within a particular rate class have different end use energy applications and then stratify the study based upon those end uses. As a practical matter, the Company does not know exactly which customers within the population have central air conditioning, heat their home with electricity, or have a pool pump. Even if the Company knew all end use energy applications for all its customers, basing load research design for a particular rate class upon the end uses within that class could be a never-ending process of segmentation. Should the residential load research study be stratified for those who heat with gas versus electricity? Should it

[19] See lines 171 through 182 of OCS witness Mr. Jacob Thomas' Direct Testimony.

also be stratified on cooling type? What about square footage of the home? Unless there was an ultimate expectation to develop mandatory rates for a specific end use, such as a customer with a Level 2 charger, this further stratification is unnecessary.

The logic behind Mr. Thomas' recommendation to stratify on charger type could also be applied to the Company's present residential load research study which is stratified on energy usage alone. In the same way that someone with a Level 2 charger and a swamp cooler could have similar energy use to a customer with a Level 1 charger and central air, a customer who lives in a small house but heats with electricity could use about the same amount of kilowatt hours as someone else who lives in a larger home and heats with gas. Ultimately, the Company's residential load research study is not designed upon end use, but on energy usage, because it is known and because different end uses are naturally inherent within a properly designed random sample of customers. In the same way, the Company's proposed load research study for the EV TOU Pilot will examine those customers who have a PEV and its random selections of customers from that population will naturally reflect the penetrations of different charger types within the study.

Q. Please describe why stratifying based upon charger type could make the load research recruitment process overly complicated.

A. The Company's proposed load research study will include 3 groups of customers (TOU Option 1, TOU Option 2, and the Control Group), which may be in three different strata for a total of nine separate tranches from which the Company must successfully recruit a certain number of customers. Adding the dimension of charger type would double the number of tranches from which the Company would need to recruit its target numbers

to 18, which could make full recruitment by the Company's deadlines more challenging to achieve. Furthermore, the Company would need to survey existing customers who have PEVs regarding whether each customer used Level 1 or Level 2 charging before it could begin the process of stratification, random sampling, and recruitment. If the response rate from this initial survey, which would ask about charger type, were to be low, recruitment targets could be further challenged. I do not think that the additional complexity and challenges of adding this dimension are worth any incremental precision that could be achieved.

Q. Are there any other reasons why stratifying based upon charger type (Level 1 or Level 2) could be problematic?

A. Yes. Like other end uses, charger type could evolve over time with a customer. A customer who used to charge her PEV on a Level 1 charger could install a Level 2 charger in the middle of the load research study. Charger type also may not necessarily be a binary choice between Level 1 and Level 2. For example, a household could have two PEVs with one which is charged on a Level 1 charger and another which is charged on a Level 2 charger.

Q. Is the charger type an irrelevant data point which should be ignored?

A. No. In my direct testimony, I include charger type as one of the items for which the Company plans to ask customers about in its surveys.[20] Certainly, the charger type can have a significant impact on a customer's hourly load profile. The Company intends to analyze the types of chargers which pilot participants indicate they use on the surveys and compare this back to the load research study results along with other data. From

[20] See line 157 of Company witness Mr. Robert M. Meredith's Direct Testimony.

this analysis, the Company hopes to draw useful inferences on the significance of charger type. While I do not think the load research study should be stratified on charger type, I do think that collecting this information through surveys will likely prove insightful.

Q. Is there another way that the Company could ensure that the Control Group as well as the groups on TOU Option 1 and TOU Option 2 include penetrations of Level 1 versus Level 2 charging that are representative of the existing population of customers with PEVs?

A. Yes. While I continue to believe that the Company's load research study as proposed is statistically defensible for the reasons previously described, another approach could be pursued which would more intentionally account for Level 1 and Level 2 penetration. Although I believe this alternative process is unnecessary, I think that it would be more manageable than Mr. Thomas' recommended approach.

Q. Please describe this alternative approach.

A. The load research study period could be extended for two years. At the time that randomly selected customers agree to participate in the study, they could indicate whether their charging was Level 1 or Level 2. Simultaneous with the first year of the study, the Company would analyze the occurrence of Level 1 and Level 2 charger type in the different groups. From all of the responses received from load research study participants, the Company could estimate Level 1 versus Level 2 penetration for the population of customers with PEVs. This estimate could then be used to determine whether each group (Control Group, TOU Option 1, and TOU Option 2) had a statistically defensible representation of charger penetration. If some of the groups did

not adequately represent the population's charger penetration levels, the Company would recruit more participants during the first year of the study until it did. By the second year of the study, any potential disparities related to charger type penetration would be eliminated.

REBUTTAL OF MS. CHERYL MURRAY

Q. To which of OCS witness Ms. Murray's recommendations will you respond?

A. I will respond to three of Ms. Murray's recommendations presented in her direct testimony. First, I will respond to two minor changes which she recommends for proposed Schedule 2E. Second, I will respond to her recommendation for a tariff which would explain the details for the load research study. Finally, I will address her recommendation to exclude customers in the ASG from the Annual Guarantee Payment.

Q. Do you agree to make the two minor changes which Ms. Murray recommends for Schedule 2E?[21]

A. Yes. Please refer to Revised Exhibit RMP___(RMM-7) for revised tariff sheets for proposed Schedule 2E.

Q. What is your opinion of Ms. Murray's recommendation to include a tariff for load research study participants?[22]

A. I think that having a tariff that explains eligibility for participation in the proposed load research study and the payment that customers would receive for their participation is a good idea. Having this tariff will make it clear who can participate in the proposed study. While Schedule 2E makes this clear for customers who are on either Company

[21] See lines 199 through 206 of OCS witness Ms. Cheryl Murray's Direct Testimony.
[22] See lines 212 through 231 of OCS witness Ms. Cheryl Murray's Direct Testimony.

proposed Option 1 or Option 2, having a tariff would make it clear that the control group participants must be subject to many of the same requirements. For example, control group participants should not be able to participate in the net metering program, so that study participants who are on one of the time-of-use options can be cleanly compared to the control group. Please refer to Exhibit RMP___(RMM-1R) for tariff sheets for proposed Schedule 121 - Plug-in Electric Vehicle Load Research Study Program.

Q. Do you agree with Ms. Murray's recommendation that customers on proposed Schedule 2E, who would not be part of the load research study, be ineligible for the Annual Guarantee Payment?[23]

A. No. I think that providing some protection against a severely adverse annual bill impact will be a necessary tool to persuade customers to enroll. I think that without the Annual Guarantee Payment, enrollment in the EV TOU Pilot could be low, because many customers might view time-of-use as simply too risky a proposition for them. Achieving a decent participation rate in the pilot from customers who are not randomly selected to be on the load research study is important, because the Company hopes to learn some important things from the ASG. Which rate option is more desirable? How might these time-of-use rates impact potential PEV adoption? Which marketing methods are the most effective? These are some of the questions which cannot be answered with the load research study alone.

Furthermore, I do not think that the Annual Guarantee Payment makes enrollment in time-of-use without risk for customers. As I discussed in my rebuttal of

[23] See lines 257 through 271 of OCS witness Ms. Cheryl Murray's Direct Testimony.

DPU witness Mr. Davis, customers who do not sufficiently respond to the time-based price signal would still face a potential 10 percent annual bill increase along with the potential for high monthly bills even with the Annual Guarantee Payment.

REBUTTAL OF MS. SARAH WRIGHT

Q. Please summarize the direct testimony of UCE witness Ms. Sarah Wright.

A. Ms. Wright argues that the Company's proposed rate options for the EV TOU Pilot undermine the policy objective of promoting energy conservation, since they do not include inverted tier block pricing.[24] She also argues that the Company's proposed rate options would unduly reward large energy users and punish small energy users.[25] Ms. Wright proposes two alternative rate options. Her first rate option "(UCE Option 1)" has a roughly 3:1 on-/off-peak energy price differential and inverted tier pricing for kilowatt hour consumption greater than 1,000 for both on- and off-peak kilowatt hours.[26] The on-peak period that she proposes for UCE Option 1 is the same as the Company's proposed on-peak period for the pilot, except that it excludes the winter non-holiday weekday morning period (8am to 10am).[27] Her second rate option "(UCE Option 2)" employs a similar rate design, but includes a 3.4 cents per kilowatt hour super off-peak energy charge that applies to usage between midnight and 6am each day.[28]

[24] See lines 154 through 176 of UCE witness Ms. Sarah Wright's Direct Testimony.
[25] See lines 129 through 153 of UCE witness Ms. Sarah Wright's Direct Testimony.
[26] See lines 268 through 273 of UCE witness Ms. Sarah Wright's Direct Testimony.
[27] See lines 248 through 254 of UCE witness Ms. Sarah Wright's Direct Testimony.
[28] See lines 309 through 326 of UCE witness Ms. Sarah Wright's Direct Testimony.

Q. Do you agree with Ms. Wright that the Company's proposed rates would undermine energy efficiency?

A. No. While the Company's proposed rate options offer prices that are less during the off-peak period, the prices during the on-peak period are much higher. Both of the Company's proposed rate options encourage energy conservation during all hours, but specifically prioritize conservation that targets the periods of time when the Company's peaks occur. Both rate options also continue to support customers making investments in energy efficiency and avoiding wasteful energy consumption.

The expectation with the EV TOU Pilot is that customers will be able to shift some of their usage, particularly PEV charging, to the off-peak period and effectively reduce their contribution to the Company's peaks. Most customers would not be able to entirely eliminate their energy consumption during the on-peak period. Since many customers will likely have usage during the on-peak period, there will be even more of an incentive to reduce usage during those times through energy efficiency measures.

Q. Have you prepared an analysis that demonstrates that the Company's proposed TOU rate options would send conservation price signals that are similar to those sent by present Schedule 1 tiered rates?

A. Yes. To further understand how the price signal from the Company's proposed TOU rate options would compare to current Schedule 1 tiered rates, I prepared Exhibit RMP___(RMM-2R). Taking the profiles from the energy efficiency measures of residential cooling and residential lighting, I determined the proportions of these profiles that occur during the Company's proposed on- and off-peak periods as well as the proportions that occur during the summer and winter months for 1,000 kilowatt

hours of annual energy savings. From these proportions, I calculated an average price for savings on both measures for a customer on TOU Rate Option 1, TOU Rate Option 2, Schedule 1 subject to the highest tier prices, and Schedule 1 subject to the lowest tier price.

From the average profile for cooling-related energy efficiency, the average price for bill savings from this measure is 12.43 cents per kilowatt hour and 14.68 cents per kilowatt hour for TOU Rate Option 1 and TOU Rate Option 2, respectively. This compares to average price of bill savings of 8.85 cents per kilowatt hour for a customer on Schedule 1 who is subject to the lowest tier of energy charges and 14.39 cents per kilowatt hour for a customer on Schedule 1 who is subject to the highest tier of energy charges. In other words, a customer on TOU Rate Option 2 who enacted cooling-related energy efficiency measures would face slightly higher average savings to a customer on Schedule 1 who was subject to the highest tier of energy charges.

The result for lighting-related energy efficiency also shows average bill savings between the two TOU rate options and Schedule 1 which are in a similar range. From the average profile for lighting-related energy efficiency, the average price for bill savings from this measure is 10.29 cents per kilowatt hour and 10.41 cents per kilowatt hour for TOU Rate Option 1 and TOU Rate Option 2, respectively. This compares to average price of bill savings of 8.85 cents per kilowatt hour for a customer on Schedule 1 who is subject to the lowest tier of energy charges and 11.98 cents per kilowatt hour for a customer on Schedule 1 who is subject to the highest tier of energy charges. For lighting-related energy efficiency measures, a customer on TOU Rate Option 2 would

face average savings that is about 15 percent lower than a customer on Schedule 1 who was subject to the highest tier of energy charges.

Q. Does time-of-use send a better price signal for energy efficiency than non time differentiated pricing?

A. Yes. When the Company evaluates energy efficiency as part of the Integrated Resource Plan "(IRP)" process, it determines that different conservation measures have more value than others.[29] The differences in value generally relate to the ability of a particular conservation measure to reduce load during the time of the Company's peak. Well-designed time-of-use rates that target consumption at peak times, like those proposed by the Company, provide a stronger price signal for those conservation measures that have more value. For example, RMP___(RMM-2R), which I just described, shows that the average price of bill savings under both of the Company's proposed TOU rate options, are greater for cooling-related energy efficiency than for lighting-related energy efficiency. This is consistent with the Company's 2015 IRP DSM Decrement Study, which also shows a value for residential cooling measures that is greater than for residential lighting measures.[29]

Q. Do you think that energy charges for the EV TOU Pilot should be subject to inverted tier block pricing?

A. No. Inverted tier block pricing, under which customers pay more for energy that they use each month in excess of some threshold, does not align well with the core principles which I espoused for the EV TOU Pilot in my direct testimony. Specifically, I do not

[29] See PacifiCorp Class 2 DSM Decrement Study for the 2015 IRP which can be found at http://www.pacificorp.com/content/dam/pacificorp/doc/Energy_Sources/Demand_Side_Management/2015/2015_Class_2_DSM_Decrement_Study.pdf.

think inverted tier pricing aligns with the core principles of encouraging electric vehicle adoption and ease of use/customer acceptance. Energy prices that become higher as a customer uses more energy during a monthly billing period directly dis-incentivize PEV adoption. A customer who makes the decision to purchase or lease a PEV and charge it at home will use incrementally more kilowatt hours than they would have otherwise. This incremental usage associated with PEV charging will be more likely to be charged at a higher price tier than that customer's other existing usage. Charging a higher energy price for a customer's PEV charging increases the payback period associated with the decision to drive a PEV and can potentially hamper PEV adoption.

Inverted tier pricing layered on top of time-of-use rates may also be more confusing for customers and harder for them to understand. It is of primary importance for the pilot that customers understand well the time periods for which prices are higher or lower under time-of-use rates. Including a component that also makes energy more costly as a customer uses more during a monthly billing period may confuse customers and distract from the message to them to manage their loads to avoid the on-peak period. Including both a time-of-use element and an inverted tier block element within the rates for the pilot may also make it harder for a customer to evaluate whether to enroll.

Charging a lot for energy during the on-peak period along with charging less for usage during the off-peak period sends a robust cost-informed price signal to which customers can respond. Including inverted prices which increase cost as overall usage rises distracts from the primary price signal to shift usage away from the on-peak period, can be confusing to customers, and can undermine PEV adoption. Also, while

time-of-use pricing has a basis in cost, tiered energy charges introduce arbitrary demarcation(s) over the course of a billing month which are not cost-based.

Q. Ms. Wright cites a presentation made by the Regulatory Assistance Project "(RAP)" that indicates that time-of-use rates which include inclining tier block rates can more effectively encourage conservation. Please comment.

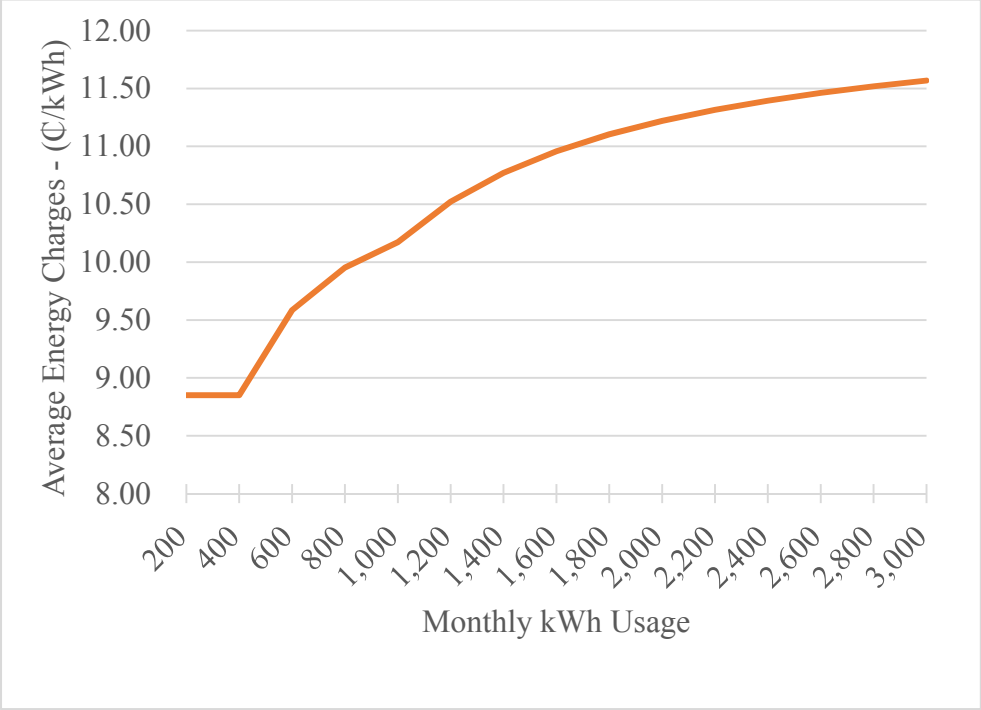
A. On November 3, 2016, RAP made a presentation regarding time-of-use rates to participants of the workshop sessions. In its presentation, RAP presented a table that suggested that a time-of-use rate with inclining tier pricing reduces peak demand and total energy more than a time-of-use rate without inclining tier pricing. I think that this table that Ms. Wright presents in her direct testimony should be viewed with some skepticism. Without the underlying data for the table, which shows very generic ranges of change to baseline energy and peak demand from different rate design structures, it is hard to substantiate these claims and whether they would specifically apply to customers in the Company's Utah service territory. Certainly, there are far more variables than the mode (i.e. critical peak pricing, demand charges, time-of-use with or without tiers) of a rate design that would impact the extent to which participants may conserve energy or reduce peak load. I do not know whether the rate designs being examined in RAP's table may be from other parts of the country or the even the world, where electricity may be more costly. I also do not know whether the underlying characteristics of the customers from the utilities included in RAP's table are similar to the Company's customers. To accurately measure the extent to which tiered pricing may actually influence energy usage and peak loads for time-of-use customers, it would be necessary for a well-designed statistically significant study to be conducted which

would test customers with tiered rates to a control group which did not have tiered prices. I think that the information which RAP presented, while interesting, does not present clear evidence that a time-of-use rate with tiers would achieve greater energy and peak reductions than a time-of-use rate without tiers or that there is a reasonable cost basis for the tiers.

Q. Ms. Wright claims that the Company's proposed rates could unfairly benefit larger energy users and penalize smaller energy users. Please discuss the impacts of the Company's proposed rates for the pilot to customers with different usage sizes and put them into context.

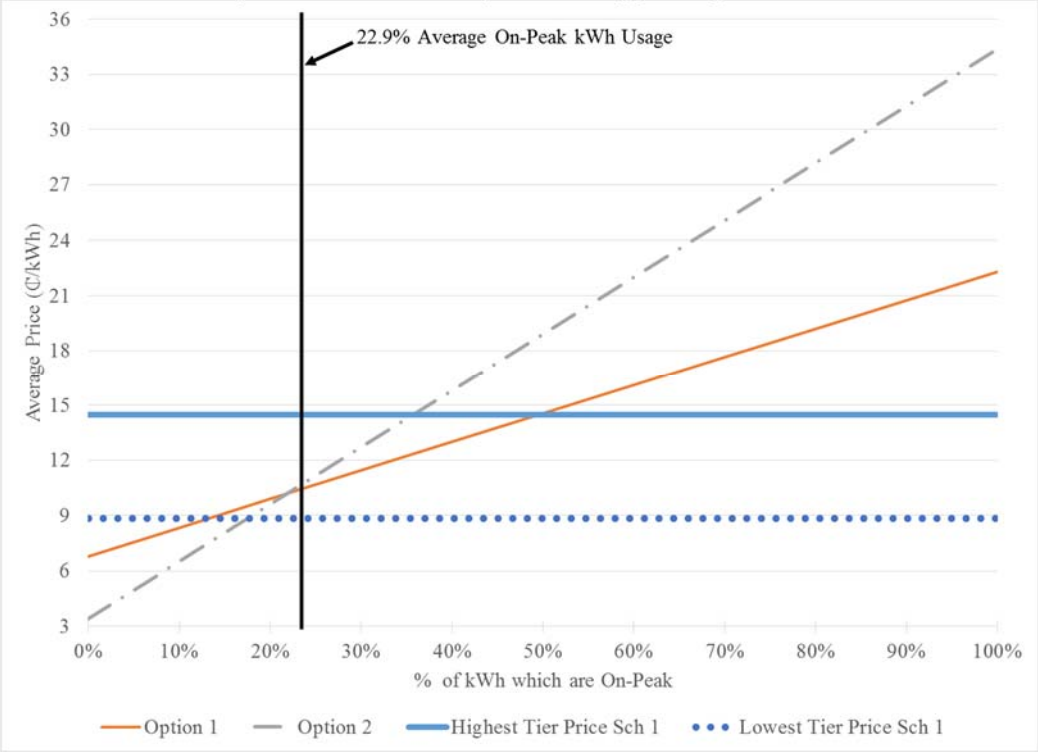
A. The Company's present rates for residential customers include inverted block pricing which makes the average price of energy higher for customers with higher overall monthly usage and lower for customers with lower overall monthly usage. Figure 1 below shows the price signal which Schedule 1, the Company's standard tariff for residential customers, presents to customers where average energy charges rise with overall monthly consumption.

Figure 1. Schedule 1 Average Energy Charges Compared to Overall Monthly Usage



The Company's proposed Option 1 and Option 2 do not discriminate based upon overall monthly usage, but rather send a more cost-informed price signal by varying average energy price for both large and small energy users by the extent to which they use energy in different time periods. Figure 2 below shows the price signal presented by the Company's proposed Option 1 and Option 2 where average energy price varies by the extent to which a customer uses during the on- and off-peak periods.

Figure 2. Proposed Schedule 2E Average Energy Charges Compared to Percentage of Energy Usage that is Off-Peak



As can be seen above in Figure 2, on-peak energy charges for both Option 1 and Option 2 have a higher price than the price of the highest tier on Schedule 1. Figure 2 also shows that the off-peak energy charges for both of the Company's proposed rate options are less than the price of the lowest tier on Schedule 1. The different bill comparisons presented by the Company and also by UCE reflect the impacts to customers at different overall energy usage levels assuming that they would have the average hourly profile. Large energy users who use disproportionately more energy during the on-peak period could have bills much higher than they would have had otherwise on Schedule 1. Conversely smaller energy users who use disproportionately more energy during the off-peak period could have bills much lower than they would have had otherwise on Schedule 1. I do not think that the Company's proposed rate options for the pilot unjustly reward large users nor unjustly punish small users. The

Company's proposed rate options would simply charge customers an average energy price that reflects the degree to which they use energy during different time periods without rewarding smaller users or punishing larger users.

Q. What is your general opinion of the rate options which Ms. Wright proposes for the EV TOU Pilot?

A. I think that the rate options which Ms. Wright proposes for the EV TOU Pilot run contrary to many of the core principles discussed at the workshops. Below is a discussion why I think that the rate options which she proposes are problematic relative to some of these core principles:

Encouraging Electric Vehicle Adoption - UCE Option 1 and UCE Option 2 both include inverted tier pricing. As I discussed earlier in my rebuttal of Ms. Wright, inverted tier pricing can dis-incentivize PEV adoption. On UCE Option 1, off-peak usage greater than 1,000 kilowatt hours in a month has a price of about 9.7 cents per kilowatt hour. This is only about five percent less than the average of energy charges for current Schedule 1 and about 43 percent and 186 percent higher than the Company's proposed Option 1 and Option 2 off-peak energy charges, respectively. While a customer's potential bill savings may vary considerably and be dependent upon individual circumstances, I think that there is much less opportunity to save money charging a PEV during the off-peak period with UCE Option 1 than with either of the Company's proposed options. Table 1 below presents the percentage savings a customer with an average profile shifting 25 percent of her usage to the off-peak period could achieve on UCE Option 1 as compared to the Company's proposed Option 1 and Option 2.

Table 1. Bill Savings from Switching 25 percent of Usage from On-Peak to Off-Peak for UCE Option 1 and Company Option 1 and Option 2

	Savings from Switching 25 percent Usage from On-Peak to Off-		
kWh	UCE Option 1	Company Option 1	Company Option 2
500	-0.6 percent	-0.4 percent	7.6 percent
750	5.0 percent	5.1 percent	13.0 percent
1,000	7.7 percent	7.8 percent	15.6 percent
1,250	6.7 percent	11.4 percent	18.9 percent
1,500	6.0 percent	13.6 percent	21.1 percent
1,750	5.5 percent	15.2 percent	22.6 percent
2,000	5.2 percent	16.4 percent	23.7 percent
2,500	4.7 percent	17.9 percent	25.1 percent
3,000	4.4 percent	19.0 percent	26.1 percent

As can be seen in Table 1, a customer with an average hourly profile who had shifted 25 percent of energy to the off-peak period would save more under all usage levels presented in the bill comparison with the Company's rate options than with UCE Option 1.

For UCE Option 2, there may be a better opportunity to save on charging a PEV, since the super off-peak energy charge is as low as the off-peak energy charge from the Company's proposed Option 2. I will specifically address why I think that UCE Option 2 is problematic later in my testimony.

Promoting Economic Efficiency - As discussed above, UCE Option 1 provides a weaker price signal for customers to shift usage away from the on-peak period than either of the Company's proposed rate options. I think that UCE Option 1 would therefore be less effective at encouraging changes in behavior that would reduce usage at the times of the Company's peaks.

Ease of Use/Customer Acceptance - As discussed earlier in my rebuttal of Ms. Wright, I believe that her proposed rates, which include both time-of-use and inverted tier block

elements, will be more confusing for customers than the Company's proposed rate options.

Q. What is your response to the super off-peak energy charge proposed by Ms. Wright for UCE Option 2?

A. I think that including a third time-of-use period for a super off-peak is more confusing, not cost-based, and may not provide PEV drivers sufficient time to charge their vehicles during the period.

Q. Please explain why the super off-peak energy charge concept that Ms. Wright presents for UCE Option 2 is not cost-based.

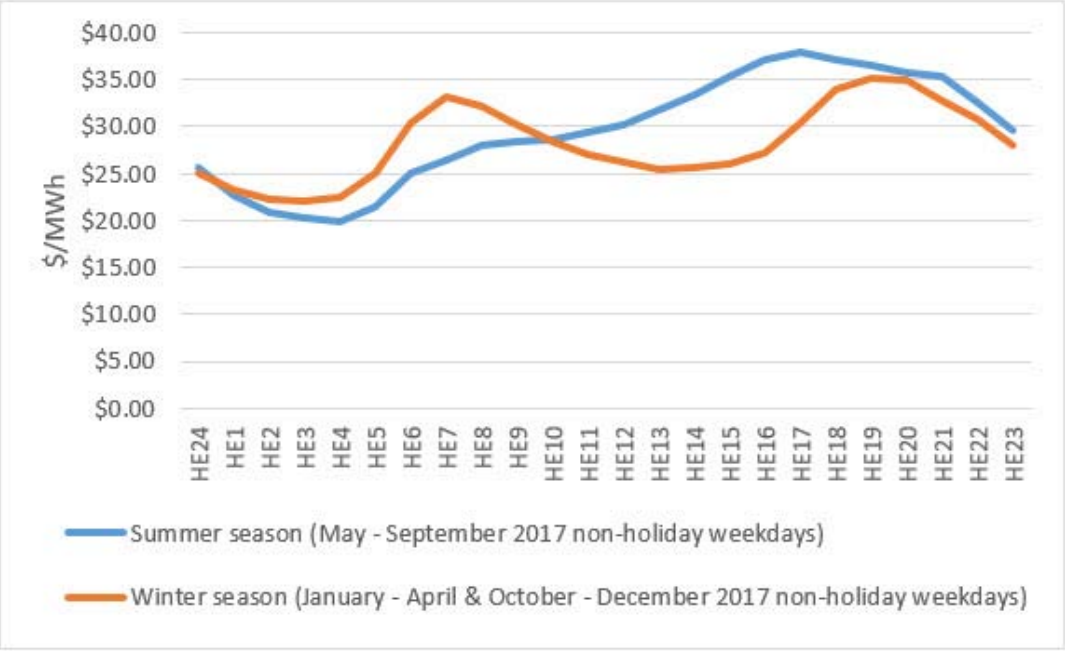
A. The basis for the on-peak and off-peak periods for the Company's proposed rate options is that the on-peak period specifically targets the hours under which the vast majority of the Company peaks occur. The Company chose this design, because significant value exists in targeted reductions to coincident peak load. As discussed earlier in my rebuttal testimony, about 60 percent of the residential class's cost of service study in the last general rate case was demand-related. For the times selected by the Company, having on-peak energy prices much higher than those during the off-peak period has a strong basis in cost.

In contrast, Ms. Wright's proposed super off-peak period is informed by times when UCE determined that loads were the lowest.[30] I do not think that this construct is well grounded by cost of service-based principles. Depending upon the tier, the off-peak energy charge is between 4.4 cents and 7 cents higher than the super off-peak energy price. Since neither the off-peak period nor the super off-peak period occur at

[31] See lines 365 through 392 of UCE witness Ms. Sarah Wright's Direct Testimony.

the same times as the Company's peaks, the only significant basis for a difference in cost between the two periods would be the difference in wholesale prices between both periods. During the workshops, the Company presented the Company's average forecast wholesale power prices at the Palo Verde hub for non-holiday weekdays. Please refer to Figure 3 below for hourly forecast Palo Verde prices for non-holiday weekdays.

Figure 3. Average Hourly Forecast Palo Verde Prices for 2017



As can be seen in Figure 3, average wholesale price does not have large absolute differences by time period relative to the magnitude of total retail residential rates. Comparing these average non-holiday weekday prices shows that prices during UCE's off-peak period are about $8.66 per megawatt hour or about 0.9 cents per kilowatt hour higher than for UCE's super off-peak period during the summer months and about $4.25 per megawatt hour or about 0.4 cents per kilowatt hour higher than for UCE's super off-peak period during the winter months. Ascribing far more value to Ms.

Wright's proposed off-peak period than to her proposed super off-peak period is not supportable.

Q. Do you think that Ms. Wright's proposed super off-peak period would provide a sufficient amount of time for a customer to charge a PEV?

A. I think that it could be challenging for some customers to fully charge their PEVs during the six hour super off-peak period proposed by Ms. Wright. While this may be less of a concern for customers who have installed a Level 2 charger, customers who have a Level 1 charger can only achieve about 4.5 miles per hour of charging.[31] During Ms. Wright's six hour super off-peak window, a customer could only charge his PEV for 27 miles of range with a Level 1 charger. This could result in customers needing to install more expensive Level 2 chargers, which could potentially be avoided with the Company's proposed time-of-use periods which include more hours of less costly energy and are more closely based upon cost as I demonstrated earlier in my testimony.

Q. Do you agree with Ms. Wright's recommendation to eliminate the morning period (8am to 10am) from the winter on-peak hours which the Company proposed?

A. No. The 8am to 10am morning period during the winter months may not be a time when Utah's loads are higher, but it is a time when the Company's overall six state system peaks occur during the winter. The Company plans on a system wide basis and costs are specifically assigned to the state of Utah based upon 12 monthly system coincident peaks. These two hours should remain part of the on-peak period for the pilot.

[32] Saxton, T. (2011, January 31). *Understanding Electric Vehicle Charging*. Retrieved from https://pluginamerica.org/understanding-electric-vehicle-charging/.

RESPONSE TO MR. KENNETH L. WILSON

Q. Please summarize WRA witness Mr. Wilson's testimony.

A. Mr. Wilson strongly supports the Company's proposed EV TOU Pilot, since it was developed collaboratively and would provide useful insights into time-of-use rates as they relate to customers who charge PEVs.[32] Mr. Wilson recommends that all aspects of the Company's proposed EV TOU Pilot, except one, be approved by the Commission. Mr. Wilson recommends that the proposed load research study run for a second year, since this would provide more data and the first year could have atypical weather.[33]

Q. What are your thoughts on running the load research study for a second year?

A. I agree with Mr. Wilson that a second year of data could be more useful. A single year may have unusual weather that would not be typical of most years. I would also add that customers may gain experience during their first year on time-of-rates and be able to more effectively shift usage to the off-peak period in a second year.

Q. Do you think that the load research study should include a second year?

A. I do not think that load research study participants should be required to be on the study for two years. While the information obtained from a second year would be useful, I am concerned that requiring a second year could be too difficult of a decision for many customers to make. Based upon discussions I have had with more externally facing Company employees, requiring a second year for the load research study may be too much of a burden for many customers. If customers believe that the requirements of

[33] See lines 14 through 26 of WRA witness Mr. Kenneth L. Wilson's Direct Testimony.
[34] See lines 153 through 161 of WRA witness Mr. Kenneth L. Wilson's Direct Testimony.

participating in the load research study are too onerous, the Company may not achieve the necessary level of participation to obtain scientific results.

Although the Company's proposed load research study only includes a one year customer commitment, the Company would continue collecting hourly profile information from participants in the load research after the first year. Many of the participants may remain on the rate option assigned to them. Also many on the control group may not choose to enroll in one of the time-of-use rate options. Even without a customer commitment, there may still be adequate data from the second year to make some useful inferences.

I recommend that the Commission require only a single year commitment from load research participants. However, if the Commission determines that a two year commitment should be required, I recommend that the Annual Guarantee Payment, which ensures that customers do not pay more than 110 percent of what their annual energy charge would have been under Schedule 1, be applied for two years for the load research study participants. The provision for the Annual Guarantee to apply for two years could be included in the load research study tariff, Schedule 121, I proposed earlier in my testimony. Requiring a two year commitment without an Annual Guarantee Payment for both years would make load research study recruitment very challenging.

REBUTTAL OF MR. JAMES ELLIS

Q. On lines 154 through 161 of his direct testimony, ChargePoint witness Mr. Ellis recommends that the Company allow participants of the EV TOU Pilot to be metered through the "embedded metering capabilities" of charging stations. Could the Company bill proposed Schedule 2E customers on the readings from a third-party sub-meter on a charging station?

A. No. I believe that Mr. Ellis' suggestion reflects a misunderstanding of the Company's proposed EV TOU Pilot. The Company's proposed Schedule 2E is not intended to be a tariff that would apply to a separately metered PEV charger. The Company's proposed EV TOU Pilot would be what is considered a "whole house" pilot. In other words, the time differentiated energy charges on the Company's proposed Schedule 2E would be applied to all household energy consumption, not just the charging of a PEV. Without installing a new meter for the entire household, a residential customer could not be billed under proposed Schedule 2E. While I appreciate Mr. Ellis' desire to share creative solutions to minimize the costs of the pilot, utilizing the embedded metering capabilities of a charging station would not eliminate the need to install a new meter.

Q. Are there other reasons why utilizing the "embedded metering capabilities" of charging stations to bill customers on the pilot would be problematic?

A. Yes. There are several reasons why this would be problematic. First, utilizing the information from third-party equipment that has not necessarily been designed to measure energy at a level of precision that is revenue grade could cause the Company to inaccurately bill customers. These "meters" are not subject to the same testing

requirements as the Company's meters which are required to ensure accurate billing determinants over the life of the meter. Second, there could be potentially many different charging station manufacturers with different measurement and communication protocols. Developing the processes to integrate that data from those sub-meters into the Company's billing system would be more costly than the cost to install new time-of-use meters for the limited number of participants that the Company intends to have on the pilot. Third, the need to incorporate "meter" reads from multiple different vendors into Company's systems could needlessly expose the Company to cyber-attacks. Fourth, as mentioned earlier in my testimony, the Commission has a statutory obligation to authorize the Company to establish a program that includes "time of use pricing for electric vehicle charging" before July 1, 2017. Revising the Company's proposed EV TOU Pilot to incorporate sub-metering from charging equipment would likely complicate the pilot's design such that this deadline would be missed. Finally, there are losses that are incurred between the point of delivery to the customer at the meter and any charging equipment which would not be appropriately captured by charger's sub-metering. For all of these reasons along with the Company's proposed pilot design being for a "whole house" time-of-use pilot that requires metering of all household usage, the Commission should reject Mr. Ellis's recommendation.

CONCLUSION

Q. Please summarize your rebuttal testimony.

A. The Company's proposed rate options are the most reasonable of those proposed by all parties who submitted testimony in this proceeding. It balances all of the important

principles for a pilot which I discussed in my direct testimony and would meet the goals of the STEP legislation. The Company's proposed Annual Guarantee Payment feature for Schedule 2E is reasonable and would make it easier for customers to make the decision to enroll. The Company's plans for its load research study were well designed and will result in accurate and actionable information without stratifying on the variable of charger type.

Q. What is your recommendation for the Commission?

A. The Company recommends that the Commission approve the Company's proposed EV TOU Pilot as modified in this testimony along with its proposed Schedule 2E and Schedule 121.

Q. Does this conclude your rebuttal testimony?

A. Yes.

Rocky Mountain Power
Exhibit RMP___(RMM-1R)
Docket No. 16-035-36
Witness: Robert M. Meredith

BEFORE THE PUBLIC SERVICE COMMISSION
OF THE STATE OF UTAH

ROCKY MOUNTAIN POWER

Exhibit Accompanying Rebuttal Testimony of Robert M. Meredith

Schedule 121

April 2017

ROCKY MOUNTAIN POWER
A DIVISION OF PACIFICORP

P.S.C.U. No. 50 **Original Sheet No. 121.1**

ROCKY MOUNTAIN POWER

ELECTRIC SERVICE SCHEDULE NO. 121

STATE OF UTAH

Plug-in Electric Vehicle Load Research Study Program

PURPOSE: To study the load profiles of customers who have plug-in electric vehicles that are registered with the Department of Motor Vehicles to the Customer or are registered to the site address under which electric service is provided.

APPLICABLE: To Rocky Mountain Power and all residential Customers taking service under the Company's Schedules 1, 2E, and 3.

CUSTOMER PARTICIPATION: Customer participation is voluntary and is initiated by the Company for randomly selected Customers who the Company's information indicates have a plug-in electric vehicle registered with the Department of Motor Vehicles in the Customer's name or at the Customer's site address. The Company shall have the right to qualify participants, at its discretion, based on criteria the Company considers necessary to ensure the effective operation of the load research study.

COMMITMENT PERIOD: Customers who agree to participate commit to remaining on the program until the load research study's completion.

THANK YOU PAYMENT: At the end of the commitment period and upon completion of a survey, Customers who participate in the Load Research Study program who fully meet all its requirements shall receive a $200 "thank you" payment from the Company. Customers may also be eligible for a separate incentive for participating in the Time of Use Pilot Program as specified in Schedule 120.

Load Research Study Program: Customers selected for the Load Research Study Program will be randomly selected by the Company to participate in either Rate Option 1 or Rate Option 2 on Schedule 2E or the Control Group. After notifying selected Customers, each Customer must agree to participate in the Load Research Study. Selected Customers who do not agree to participate within any deadlines which may be specified by an offer extended from the Company to the Customer may be rendered ineligible for this program.

Control Group: During the commitment period, Customers on the Control Group may not receive service from Electric Service Schedule 2 or Schedule 2E and may not participate in Net Metering (Schedule 135) or Subscriber Solar (Schedule 73).

(continued)

ROCKY MOUNTAIN POWER
A DIVISION OF PACIFICORP

P.S.C.U. No. 50 **Original Sheet No. 121.2**

ELECTRIC SERVICE SCHEDULE NO. 121 – Continued

SPECIAL CONDITIONS:

1. Customers participating in this program who are selected to be on one of the rate options on Schedule 2E, must remain on that rate option and otherwise abide by the conditions specified in Schedule 2E for the full commitment period.
2. Customers shall provide safe and unobstructed access to the Company's meter.

TERM: This Schedule terminates January 1, 2022, unless modified by order of the Public Service Commission of Utah.

ELECTRIC SERVICE REGULATIONS: Service under this Schedule will be in accordance with the terms of the Electric Service Agreement between the Customer and the Company. The Electric Service Regulations of the Company on file with and approved by the Public Service Commission of the State of Utah, including future applicable amendments, will be considered as forming a part of and incorporated in said Agreement.

Rocky Mountain Power
Exhibit RMP___(RMM-2R)
Docket No. 16-035-36
Witness: Robert M. Meredith

BEFORE THE PUBLIC SERVICE COMMISSION
OF THE STATE OF UTAH

ROCKY MOUNTAIN POWER

Exhibit Accompanying Rebuttal Testimony of Robert M. Meredith

Estimated Savings from Energy Efficiency on Time-of-Use

April 2017

Estimated Savings from Energy Efficiency on Time-of-Use

1,000 kWh of Annual Cooling Energy Efficiency

	On-Peak	Off-Peak	Total	Average
Energy (kWh)	364	636	1,000	
TOU Option 1 Price (¢ per kWh)	22.2755	6.7881		12.4277
TOU Option 2 Price (¢ per kWh)	34.3753	3.4003		14.6796
	Summer	**Winter**	**Total**	
Energy (kWh)	984	16	1,000	
Price for Customer on Lowest Tier (¢ per kWh)	8.8498	8.8498		8.8498
Price for Customer on Highest Tier (¢ per kWh)	14.4508	10.7072		14.3895

1,000 kWh of Annual Lighting Efficiency

	On-Peak	Off-Peak	Total	Average
Energy (kWh)	226	774	1,000	
TOU Option 1 Price (¢ per kWh)	22.2755	6.7881		10.2936
TOU Option 2 Price (¢ per kWh)	34.3753	3.4003		10.4114
	Summer	**Winter**	**Total**	
Energy (kWh)	341	659	1,000	
Price for Customer on Lowest Tier (¢ per kWh)	8.8498	8.8498		8.8498
Price for Customer on Highest Tier (¢ per kWh)	14.4508	10.7072		11.9840

Footnote:
This analysis used the same end use load shapes used to develop Utah Class 2 DSM inputs for the 2017 Integrated Resource Plan. The cooling load shape was developed through building simulation modeling with Utah weather. The lighting load shape is based on metering results from the Northwest Energy Efficiency Alliance's Residential Building Stock Assessment.

Rocky Mountain Power
Revised Exhibit RMP___(RMM-5)
Docket No. 16-035-36
Witness: Robert M. Meredith

BEFORE THE PUBLIC SERVICE COMMISSION
OF THE STATE OF UTAH

ROCKY MOUNTAIN POWER

Revised Exhibit Accompanying Direct Testimony of Robert M. Meredith

Incremental Cost to Fuel Comparison

April 2017

Rocky Mountain Power
Cost to "Fuel" Plug-In Electric Vehicle under Current and Proposed EV TOU Pilot Rates

	Gasoline	Present Residential Sch 1	Present Time-of-Day Sch 2	Proposed EV TOU Pilot Option 1	Proposed EV TOU Pilot Option 2
Incremental Internal Combustion Engine (ICE) Vehicle Fuel Cost	$71.52				
Incremental Plug-In Electric Vehicle (PEV) "Fuel" Cost		$41.13	$38.66	$24.90	$12.47
Savings from Fueling with Gasoline		$30.39	$32.86	$46.62	$59.05

Assumptions

Average Monthly Usage (not including PEV)	698
PEV kWh (Off-Peak)	347
Average Miles per Year[1]	13,884
per Month	1,157
Price of gas per gallon[2]	$2.250
PEV Fuel Efficiency (kWh per Mile)[3]	0.3
ICE fuel efficiency (mpg)[4]	36.4

[1]U.S. Department of Transportation Average Annual Miles per Vehicle for the year 2000. See: http://www.fhwa.dot.gov/ohim/onh00/onh2p11.htm

[2]Utah Average Gas Price as of January 24, 2017. See: http://gasprices.aaa.com/?state=UT

[3]EPA rating for 2015 Nissan Leaf is 30 kWh per 100 miles. See: http://www.pluginamerica.org/drivers-seat/how-much-does-it-cost-charge-electric-car

[4]New passenger vehicle fuel efficiency for 2014. See: http://www.rita.dot.gov/bts/sites/rita.dot.gov.bts/files/publications/national_transportation_statistics/html/table_04_23.html

Rocky Mountain Power
Revised Exhibit RMP___(RMM-7)
Docket No. 16-035-36
Witness: Robert M. Meredith

BEFORE THE PUBLIC SERVICE COMMISSION
OF THE STATE OF UTAH

ROCKY MOUNTAIN POWER

Revised Exhibit Accompanying Direct Testimony of Robert M. Meredith

Schedule 2E

April 2017

ROCKY MOUNTAIN POWER
A DIVISION OF PACIFICORP

P.S.C.U. No. 50 **Original Sheet No. 2E.1**

ROCKY MOUNTAIN POWER

ELECTRIC SERVICE SCHEDULE NO. 2E

STATE OF UTAH

Residential Service – Electric Vehicle Time-of-Use Pilot Option

AVAILABILITY: At any point on the Company's interconnected system where there are facilities of adequate capacity. This Electric Service Schedule shall be available for qualifying Customers (1) selected by the Company to participate in a load research study, and (2) up to 1,000 additional Customers on a first-come, first-served basis. To qualify under this Electric Service Schedule, Customers must either submit a copy of a Department of Motor Vehicle registration for a plug-in electric vehicle that is registered to the Customer or is registered to the site address under which electric service is provided, or have been selected to participate in Schedule 121 - Plug-In Electric Vehicle Load Research Study Program by the Company.

APPLICATION: This Schedule is for alternating current electric service for residential purposes supplied at approximately 120 or 240 volts through one meter at a single point of delivery for service required on the premises for residential purposes.

When conditions are such that service is supplied through one meter to more than one dwelling or apartment unit, the charge for such service will be computed by multiplying the number of kWh in each applicable usage block, and the Customer Service Charge by the maximum number of dwelling or apartment units that may be served.

When a portion of a dwelling is used regularly for business, professional or other gainful purposes and 50 percent or more of the electrical energy supplied to that dwelling is being used for residential purposes, the premises shall be subject to this or other residential rates. If 50 percent or more of the electrical energy supplied to the premises is used for other than residential purposes, the premises will be classified as non-residential and electric service shall be provided under the appropriate non-residential schedule. However, if the wiring is so arranged that the service for residential purposes can be metered separately, this Schedule will be applied to such service.

MONTHLY BILL:

Customer Service Charge:
Single phase: $6.00 per customer
Three phase: $12.00 per customer

(continued)

ROCKY MOUNTAIN POWER
A DIVISION OF PACIFICORP

P.S.C.U. No. 50 **Canceling Original Sheet No. 2E.2**

ELECTRIC SERVICE SCHEDULE NO. 2E – Continued

MONTHLY BILL: (continued)

Energy Charge:

Rate Option 1:
22.2755¢ per kWh for all On-Peak kWh
6.7881¢ per kWh for all Off-Peak kWh

Rate Option 2:
34.3753¢ per kWh for all On-Peak kWh
3.4003¢ per kWh for all Off-Peak kWh

MINIMUM:
$ 8.00 for single-phase service
$16.00 for three-phase service

SURCHARGE ADJUSTMENT: All monthly bills shall be adjusted in accordance with Schedule 80.

TIME PERIODS:

On-Peak: October through April inclusive
8:00 a.m. to 10:00 a.m., and 3:00 p.m. to 8:00 p.m., Monday thru Friday, except holidays.
May through September inclusive
3:00 p.m. to 8:00 p.m., Monday thru Friday, except holidays.
Off-Peak: All other times.

Holidays include only New Year's Day, President's Day, Memorial Day, Independence Day, Pioneer Day, Labor Day, Thanksgiving Day, and Christmas Day. When a holiday falls on a Saturday or Sunday, the Friday before the holiday (if the holiday falls on a Saturday) or the Monday following the holiday (if the holiday falls on a Sunday) will be considered a holiday and consequently Off-Peak.

GUARANTEE PAYMENT: The Company shall guarantee against increase of Customer costs for the first 12 months of enrollment on this tariff schedule. If the total annual energy costs incurred on this Schedule exceed 10% over what costs would have been for the same period under Schedule 1 rates, the net difference, Guarantee Payment, will be credited on the customer's bill following the last month of the one-year commitment. No Guarantee Payment shall be given if Customer terminates service before the end of the initial one-year period.

(continued)

ROCKY MOUNTAIN POWER
A DIVISION OF PACIFICORP

P.S.C.U. No. 50 **Canceling Original Sheet No. 2E.3**

ELECTRIC SERVICE SCHEDULE NO. 2E – Continued

SPECIAL CONDITIONS:

1. Customer on this tariff schedule shall have a term of not less than one year. Service will continue under this schedule until Customer notifies the Company to discontinue service, or if the Company, upon approval by the Commission, otherwise terminates this optional tariff schedule.

2. Customer on this tariff schedule who is not a part of the load research study shall elect either rate option 1 or rate option 2. Upon request of the Customer, the Company shall change the rate option under which the customer is billed up to one time per year.

3. Billing under this schedule shall begin for the Customer following installation of the time-of-use meter and the initial meter reading.

4. Enrollment in this Electric Service Schedule is subject to the availability of funds for the Plug-In Electric Vehicle Incentive Pilot Program.

5. The Company will not accept enrollment for accounts that have:

   - Time-payment agreement in effect
   - Received two or more final disconnect notices
   - Been disconnected for non-payment within the last 12 months.

6. Customers being served under this schedule may not participate in Net Metering (Schedule 135) or Subscriber Solar (Schedule 73).

7. After December 31, 2020, the Company will no longer accept Customers onto this tariff schedule.

(continued)

ROCKY MOUNTAIN POWER
A DIVISION OF PACIFICORP

P.S.C.U. No. 50 **Original Sheet No. 2E.4**

ELECTRIC SERVICE SCHEDULE NO. 2E – Continued

CONNECTION FEE: Each time a Customer, eligible to receive electric service under this Schedule, begins to receive electric service at a point of delivery not previously used, or at a point of delivery which has been used previously by another Customer, or each time a Customer changes his point of delivery or reconnects after voluntary disconnection to the same point of delivery, that Customer shall be charged a connection fee of $10.00.

At the discretion of the Company, the connection fee may be waived for account holders such as landlords and real estate agents who accept, on a temporary basis, responsibility for the accounts of vacant residential units during the transitional time of vacancy in those cases where the cost to the Company of the physical discontinuance and restoration of electrical service would exceed the amount of the connection fee.

ELECTRIC SERVICE REGULATIONS: Service under this Schedule will be in accordance with the terms of the Electric Service Agreement between the Customer and the Company. The Electric Service Regulations of the Company on file with and approved by the Public Service Commission of the State of Utah, including future applicable amendments, will be considered as forming a part of and incorporated in said Agreement.

ROCKY MOUNTAIN POWER
A DIVISION OF PACIFICORP

P.S.C.U. No. 50 **Original Sheet No. 2E.1**

ROCKY MOUNTAIN POWER

ELECTRIC SERVICE SCHEDULE NO. 2E

STATE OF UTAH

Residential Service – Electric Vehicle Time-of-Use Pilot Option

AVAILABILITY: At any point on the Company's interconnected system where there are facilities of adequate capacity. This Electric Service Schedule shall be available for qualifying Customers (1) selected by the Company to participate in a load research study, and (2) up to 1,000 additional Customers on a first-come, first-served basis. To qualify under this Electric Service Schedule, Customers must either submit a copy of a Department of Motor Vehicle registration for a plug-in electric vehicle that is registered to the Customer or is registered to the site address under which electric service is provided, or have been selected to participate in Schedule 121 - Plug-In Electric Vehicle Load Research Study Program by the Company.

APPLICATION: This Schedule is for alternating current electric service for residential purposes supplied at approximately 120 or 240 volts through one meter at a single point of delivery for service required on the premises for residential purposes.

When conditions are such that service is supplied through one meter to more than one dwelling or apartment unit, the charge for such service will be computed by multiplying the number of kWh in each applicable usage block, and the Customer Service Charge by the maximum number of dwelling or apartment units that may be served.

When a portion of a dwelling is used regularly for business, professional or other gainful purposes and 50 percent or more of the electrical energy supplied to that dwelling is being used for residential purposes, the premises shall be subject to this or other residential rates. If 50 percent or more of the electrical energy supplied to the premises is used for other than residential purposes, the premises will be classified as non-residential and electric service shall be provided under the appropriate non-residential schedule. However, if the wiring is so arranged that the service for residential purposes can be metered separately, this Schedule will be applied to such service.

MONTHLY BILL:

Customer Service Charge:
Single phase: $6.00 per customer
Three phase: $12.00 per customer

(continued)

ROCKY MOUNTAIN POWER
A DIVISION OF PACIFICORP

P.S.C.U. No. 50 **Canceling Original Sheet No. 2E.2**

ELECTRIC SERVICE SCHEDULE NO. 2E – Continued

MONTHLY BILL: (continued)

Energy Charge:

Rate Option 1:
22.2755¢ per kWh for all On-Peak kWh
6.7881¢ per kWh for all Off-Peak kWh

Rate Option 2:
34.3753¢ per kWh for all On-Peak kWh
3.4003¢ per kWh for all Off-Peak kWh

MINIMUM:
$ 8.00 for single-phase service
$16.00 for three-phase service

SURCHARGE ADJUSTMENT: All monthly bills shall be adjusted in accordance with Schedule 80.

TIME PERIODS:

On-Peak:	October through April inclusive 8:00 a.m. to 10:00 a.m., and 3:00 p.m. to 8:00 p.m., Monday thru Friday, except holidays. May through September inclusive 3:00 p.m. to 8:00 p.m., Monday thru Friday, except holidays.
Off-Peak:	All other times.

Holidays include only New Year's Day, President's Day, Memorial Day, Independence Day, Pioneer Day, Labor Day, Thanksgiving Day, and Christmas Day. When a holiday falls on a Saturday or Sunday, the Friday before the holiday (if the holiday falls on a Saturday) or the Monday following the holiday (if the holiday falls on a Sunday) will be considered a holiday and consequently Off-Peak.

GUARANTEE PAYMENT: The Company shall guarantee against increase of Customer costs for the first 12 months of enrollment on this tariff schedule. If the total annual energy costs incurred on this Schedule exceed 10% over what costs would have been for the same period under Schedule 1 rates, the net difference, Guarantee Payment, will be credited on the customer's bill following the last month of the one-year commitment. No Guarantee Payment shall be given if Customer terminates service before the end of the initial one-year period.

(continued)

ROCKY MOUNTAIN POWER
A DIVISION OF PACIFICORP

P.S.C.U. No. 50 **Canceling Original Sheet No. 2E.3**

ELECTRIC SERVICE SCHEDULE NO. 2E – Continued

SPECIAL CONDITIONS:

1. Customer on this tariff schedule shall have a term of not less than one year. Service will continue under this schedule until Customer notifies the Company to discontinue service, or if the Company, upon approval by the Commission, otherwise terminates this optional tariff schedule.

2. Customer on this tariff schedule who ~~are~~ is not a part of the load research study shall elect either rate option 1 or rate option 2. Upon request of the Customer, the Company shall change the rate option under which the customer is billed up to one time per year.

~~3. To qualify under this Electric Service Schedule, Customers must either submit a copy of a Department of Motor Vehicle registration for a plug-in electric vehicle that is registered to the Customer or is registered to the site address under which electric service is provided, or have been selected to participate in a load research study by the Company based upon Department of Motor Vehicle information.~~

~~4.~~3. Billing under this schedule shall begin for the Customer following installation of the time-of-use meter and the initial meter reading.

~~5.~~4. Enrollment in this Electric Service Schedule is subject to the availability of funds for the Plug-In Electric Vehicle Incentive Pilot Program.

~~6.~~5. The Company will not accept enrollment for accounts that have:

- Time-payment agreement in effect
- Received two or more final disconnect notices
- Been disconnected for non-payment within the last 12 months.

~~7.~~6. Customers being served under this schedule may not participate in Net Metering (Schedule 135) or Subscriber Solar (Schedule 73).

~~8.~~7. After December 31, 2020, the Company will no longer accept Customers onto this tariff schedule.

(continued)

ROCKY MOUNTAIN POWER
A DIVISION OF PACIFICORP

P.S.C.U. No. 50 **Original Sheet No. 2E.4**

ELECTRIC SERVICE SCHEDULE NO. 2E – Continued

CONNECTION FEE: Each time a Customer, eligible to receive electric service under this Schedule, begins to receive electric service at a point of delivery not previously used, or at a point of delivery which has been used previously by another Customer, or each time a Customer changes his point of delivery or reconnects after voluntary disconnection to the same point of delivery, that Customer shall be charged a connection fee of $10.00.

At the discretion of the Company, the connection fee may be waived for account holders such as landlords and real estate agents who accept, on a temporary basis, responsibility for the accounts of vacant residential units during the transitional time of vacancy in those cases where the cost to the Company of the physical discontinuance and restoration of electrical service would exceed the amount of the connection fee.

ELECTRIC SERVICE REGULATIONS: Service under this Schedule will be in accordance with the terms of the Electric Service Agreement between the Customer and the Company. The Electric Service Regulations of the Company on file with and approved by the Public Service Commission of the State of Utah, including future applicable amendments, will be considered as forming a part of and incorporated in said Agreement.

CERTIFICATE OF SERVICE

I hereby certify that on April 27, 2017, a true and correct copy of the foregoing was served by electronic mail on the following:

OFFICE OF CONSUMER SERVICES
Michele Beck - mbeck@utah.gov
UTAH DIVISION OF PUBLIC UTILITIES
Erika Tedder - etedder@utah.gov
ASSISTANT UTAH ATTORNEYS GENERAL
Patricia Schmid - pschmid@utah.gov Justin Jetter - jjetter@utah.gov Robert Moore - rmoore@utah.gov Steven Snarr - ssnarr@utah.gov
WESTERN RESOURCE ADVOCATES
Jennifer E. Gardner - jennifer.gardner@westernresources.org Nancy Kelly - nkelly@westernresources.org Dave Effross - dave.effross@westernresources.org Penny Anderson - penny.anderson@westernresources.org Ken Wilson - ken.wilson@westernresources.org
UTAH CLEAN ENERGY
Sophie Hayes - sophie@utahcleanenergy.org Mitalee Gupta - mgupta@utahcleanenergy.org
SIERRA CLUB
Gloria Smith - gloria.smith@sierraclub.org Travis Ritchie - travis.ritchie@sierraclub.org Joseph Halso - joe.halso@sierraclub.org
UTAH ASSOCIATION OF ENERGY USERS
Gary A. Dodge - gdodge@hjdlaw.com Phillip J. Russell - prussell@hjdlaw.com Kevin Higgins - khiggins@energystrat.com Neal Townsend - ntownsend@energystrat.com
SALT LAKE CITY CORPORATION
Megan J. DePaulis - megan.depaulis@slcgov.com
CHARGEPOINT, INC.
Stephen F. Mecham - sfmecham@gmail.com

Jennifer Angell
Supervisor, Regulatory Operations