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**BEFORE THE PUBLIC UTILITIES COMMISSION OF NEVADA**  
Nevada Power Company d/b/a NV Energy  
Sierra Pacific Power Company d/b/a NV Energy  
Net Metering and Distributed Generation Cost of Service and Tariff Design  
Docket Nos. 15-07041 and 15-07042

**PREPARED REBUTTAL TESTIMONY  
OF**

**AHMAD FARUQUI**

**1. Q. PLEASE STATE YOUR NAME, JOB TITLE AND BUSINESS ADDRESS AND PARTY FOR WHOM YOU ARE FILING TESTIMONY.**

A. My name is Ahmad Faruqui. I am a principal at The Brattle Group. My business address is 201 Mission Street, Suite 2800, San Francisco, California, 94105. I am filing testimony on behalf of Nevada Power Company (“Nevada Power”) and Sierra Pacific Power Company (“Sierra” and, together with Nevada Power, the “Companies”).

**2. Q. DID YOU PREPARE AND FILE TESTIMONY AS PART OF THE COMPANY’S DIRECT CASE?**

A. Yes, I did.

**3. Q. WHAT IS THE PURPOSE OF YOUR REBUTTAL TESTIMONY IN THIS CASE?**

A. I rebut certain of the factual claims and conclusions of the following witnesses:

- Thomas R. Beach and Tim Woolf, who filed testimony on behalf of The Alliance for Solar Choice (“TASC”);
- William P. Marcus on behalf of the Bureau of Consumer Protection (“BCP”);

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- Rick Gilliam on behalf of Vote Solar; and
- Dr. Ren Anderson on behalf of the Southern Nevada Home Builders Association (“SNHBA”). The specific claims and conclusions that I rebut are described below.

**4. Q. DO THE COMPANIES’ PROPOSALS RECOGNIZE AND CONSIDER THE RELEVANT RATEMAKING PRINCIPLES?**

A. Yes. The Companies’ proposals take into consideration the principles of rate stability, efficiency, equity, as well as the principles of simplicity, understandability, public acceptability and feasibility of application.

**5. Q. ON PAGE 29, LINES 6-13, WITNESS WOOLF STATES THAT THE “COMPANY’S PROPOSAL FOCUSES ALMOST ENTIRELY ON THE PRINCIPLES OF REVENUE ADEQUACY” AND FURTHER ARGUES THAT “THIS APPROACH DOES NOT ADDRESS OTHER KEY RATEMAKING PRINCIPLES.” ON THE SAME PAGE, LINES 16-19, MR. WOOLF SAYS THAT THE COMPANY’S PROPOSAL FAILS TO “SATISFY THE PRINCIPLES OF RATE STABILITY, EFFICIENCY, EQUITY AND THAT OF “SIMPLICITY, UNDERSTANDABILITY, PUBLIC ACCEPTABILITY, AND FEASIBILITY OF APPLICATION.” DO YOU AGREE WITH THESE CONCLUSIONS?**

A. No, I don’t. I will discuss below how the Companies’ proposals deal with each of these principles individually.

1 6. Q. ARE THE STANDARD AND OPTIONAL NET ENERGY METERING  
2 (“NEM”) OFFERINGS BEING PROPOSED BY THE COMPANIES  
3 CONSISTENT WITH NOTIONS OF RATE STABILITY?<sup>1</sup>

4 A. Yes. Bonbright says that rates should be changed gradually “with a minimum  
5 of unexpected changes seriously adverse to existing customers”<sup>2</sup>. The  
6 Companies’ proposals are consistent with the principle of rate stability.  
7 Because they do not impact existing full requirements customers and NEM1  
8 customers, they do not contain any unexpected changes that are adverse to  
9 existing full requirements customers or to NEM partial requirements  
10 customers. Indeed, if adopted, the Companies’ proposals will benefit existing  
11 customers. Mr. Woolf’s conclusion ignores the fact that NEM2 customers are  
12 choosing an optional, partial requirements service. As Staff witness Ms. Cuneo  
13 correctly states in her prepared testimony (filed on behalf of the Regulatory  
14 Operations Staff), customers who install on-site generation select a different  
15 category of service.<sup>3</sup> It is also important to note that rate stability is not an end  
16 in itself and has to be weighed along with other criteria. The NEM1 rates have  
17 outlived their usefulness. They were required to jump start the installation of  
18 solar panels and have successfully done so in the time it took to reach the  
19 statutory cap. The pace of solar adoption has increased dramatically as system  
20 prices have declined. In my opinion, the net metering subsidy has served its  
21 purpose and is no longer necessary. Cautioning us against the “tyranny of the  
22 status quo” Professor Bonbright says: “Good-faith standards of fairness have  
23 been invoked by ratepayers no less than by investors in support of rates that  
24 would otherwise be deemed infeasible. The appeal is likely to take the form of

25 <sup>1</sup> Prepared Direct Testimony of Tim Woolf at 30, lines 13-22 (arguing that the Companies’ proposals violate  
26 the principle of rate stability).

<sup>2</sup> Bonbright, p.291, quoted in Prepared Direct Testimony of Thomas Woolf on Behalf of The Alliance for  
27 Solar Choice (TASC), p.30, lines 13-14.

<sup>3</sup> See Prepared Direct Testimony of Anne-Marie Cuneo at 9, lines 9 – 13.

1 an insistence by a particular class of ratepayers on the right to the continued  
2 enjoyment of low rates which, while originally justified by cost analysis or  
3 otherwise, have subsequently been made obsolete by changed conditions  
4 including, particularly the changes in load factors or the appearance of  
5 competition. There are certainly valid cost effective planning arguments for  
6 having predictable and stable rates. However, as a matter of legal doctrine, the  
7 previous argument has dubious standing in view of the generally accepted  
8 principle that public utility rates are subject to revision if and when they  
9 become unreasonable.”<sup>4</sup>

10  
11 **7. Q. HOW DO THE COMPANIES’ PROPOSALS DEAL WITH THE ISSUE**  
12 **OF EFFICIENCY?**<sup>5</sup>

13 A. Efficiency consists of making optimal use of scarce resources, which include  
14 both capital and fuel. Cost-reflective prices help individuals make these  
15 decisions independently. A demand charge is designed to promote efficient  
16 use of scarce capital resources by giving customers an incentive to improving  
17 utilization of capacity. Since capacity includes generation, transmission and  
18 distribution capacities, it is often the case that more than one demand charge  
19 needs to be offered: one based on the customer’s maximum demand (which  
20 drives investment in distribution systems) and one based on the customer’s  
21 coincident peak demand (which drives investment in generation and  
22 transmission systems). Existing rates for existing NEM customers do not have  
23 a demand charge and provide the customer no incentive to use capacity  
24 efficiently. They do have an energy charge but that does not vary by time-of-  
25 day and provides no incentive to use capacity efficiently. Moreover, since the

26 <sup>4</sup> James C. Bonbright, Albert L. Danielsen and David R. Kamerschen, Principles of Public Utility Rates,  
27 Second Edition, Public Utility Reports, Inc., 1988, p. 187.

<sup>5</sup> Woolf Direct at 30, lines 16-19.

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demand charge is embedded in the energy charge, the latter is higher than its cost basis and is thus sub-optimal from an efficiency perspective. Over incentivizing energy conservation through higher-than-cost energy charges is as bad as over-incentivizing energy consumption through lower-than-cost energy charge. If reducing energy use was the only goal of rate making, then one would set energy prices as high as possible, regardless of cost.

**8. Q. DO MESSRS. WOOLF AND GILLIAM INCORRECTLY EQUATE DEMAND CHARGES WITH FIXED CHARGES?<sup>6</sup>**

A. Yes, they do. Demand charges are based on the customer’s demand for electricity, which are variable and largely under the customer’s control. I will discuss this point further in my testimony. Fixed charges are not under the customer’s control. However, both are essential elements in electric rate design, since they mirror the structure of utility costs and have been a staple of large commercial and industrial rates for decades. Their usage is discussed in several places in Bonbright’s canon,<sup>7</sup> and to the best of my knowledge, their use has not been questioned in regulatory circles. Bonbright cites the earlier text by the British engineer D. J. Bolton,<sup>8</sup> who states: “More accurate costing has shown that, on the average, only one-quarter of the total costs of electricity supply are represented by coal<sup>9</sup> or items proportional to energy, while three-quarters are represented by fixed costs or items proportional to power, etc. If therefore only one rate is to be levied it would appear more logical to charge for power and neglect the energy, were it not for certain practical difficulties

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<sup>6</sup> Woolf Direct at 32, lines 3-6; see also Prepared Direct Testimony of Rick Gilliam at 53, lines 6-7.  
<sup>7</sup> James C. Bonbright, *Principles of Public Utility Rates*, Columbia University Press, 1961.  
<sup>8</sup> Bonbright says that “On many technical issues, no American treatise on electric utility rates can equal that by the distinguished British rate engineer D. J. Bolton.” Page 289, n. 3.  
<sup>9</sup> Coal was the dominant fuel for generating electricity in the United Kingdom in 1938 when the book was first published.

1 of which the following are two. In the first place the effective power demand  
2 on the system made by any particular consumer is extremely difficult to  
3 estimate, and is very different from the individual maximum demand metered  
4 at the consumer's terminals. Secondly, a purely power tariff would probably  
5 lead to a waste of energy to a greater extent than a purely energy tariff leads  
6 to waste of power."<sup>10</sup> Of course, with the arrival of smart meters to the  
7 Companies, customer demand at times of system and distribution peak can be  
8 accurately recorded. And the choice is no longer a binary one of imposing  
9 either a demand-only rate or an energy-only rate. It is possible now to deploy  
10 a three-part pricing structure that better reflects the cost of providing electric  
11 services in the Companies' service territories. That is exactly what the  
12 Companies have proposed. Interestingly, when Bonbright discusses a two-part  
13 rate structure, he is referring to what he characterizes as "the two most  
14 important cost functions of an electric-utility system"<sup>11</sup>-- demand and energy  
15 charges. When he moves into a discussion of three-part rate structures, he adds  
16 truly fixed charges, customer charges, to the two-part rate concept. Three-part  
17 rates are discussed at length in Bonbright's canon, beginning on page 346.<sup>12</sup>  
18 Bonbright is unequivocal in his criticism of energy-only rates since they treat  
19 "the total cost of the business as if it varied directly with changes in in the  
20 kilowatt-hour output of energy – a grossly false assumption – it violates the  
21 most widely accepted canon of fair pricing, the principle of service at cost."<sup>13</sup>

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25 <sup>10</sup> D. J. Bolton, *Costs and Tariffs in Electricity Supply*, Chapman & Hall Ltd., 1951, p. 59.

26 <sup>11</sup> Bonbright, p. 310.

27 <sup>12</sup> Bonbright, second edition, page 401, credits Doherty with extending the Hopkinson two-part rate into a  
three part rate. Henry L. Doherty, "Equitable, Uniform and Competitive Rates," Proceedings of the National Electric  
Light Association, 1900, pp. 291-321.

28 <sup>13</sup> Bonbright, second edition, page 397.

1     **9.     Q.     ARE THE COMPANIES’ PROPOSALS CONSISTENT WITH**  
2                   **PRINCIPLES OF EQUITY?<sup>14</sup>**

3           A.     Yes. Equity is best served by providing cost-based price signals to all  
4                   customers. The pricing structure and prices proposed by the Companies are  
5                   cost-based. Currently NEM1 customers, who are embedded in other rate  
6                   classes, are under-paying for the electric services they are buying from the  
7                   grid. This happens because a portion of the fixed cost and all of the demand  
8                   cost in the otherwise applicable rate schedule are rolled into the energy charge.  
9                   When a NEM customer reduces his (or her) energy consumption with solar  
10                  generation, he (or she) lowers his bill at the full retail energy rate, which  
11                  includes charges not only for fuel costs but also for fixed and demand costs,  
12                  which do not go down because they consumed less energy. Because they are  
13                  under-paying, the difference has to be collected from non-NEM customers.  
14                  That is an inequity which is being addressed and resolved by the Companies’  
15                  proposals. A wrong is being corrected. Stated simply, there is no need for non-  
16                  NEM customers to continue subsidizing NEM customers. It is important to  
17                  note that this issue of under-collection of revenue from NEM customers and  
18                  over-collecting of revenues from non-NEM customers is an equity issue even  
19                  if NEM and non-NEM customers had identical marginal costs of service.  
20

21     **10.    Q.    WILL THE CREATION OF NEW RATE CLASSES CREATE A BAD**  
22                   **PRECEDENT?<sup>15</sup>**

23           A.     No. To the contrary, creation of separate classes for NEM customers allows  
24                   the Commission to establish fair and equitable, cost-based rates that reflect the  
25                   unique services provided to these partial requirements customers. NEM  
26

27     <sup>14</sup>     Woolf Direct at 33-34.

28     <sup>15</sup>     Woolf Direct at 33.

1 customers are different from all non-NEM customers in that they are partial  
2 requirement customers and because the costs of rooftop solar panels are falling  
3 dramatically, their rate of growth is much higher than the rate of growth of any  
4 other sub-class of customers. Cost-based pricing structures promote equity, an  
5 important rate making attribute.

6  
7 **11. Q. WITNESS WOOLF, ON PAGE 33, LINES 7-8, ARGUES THAT THE**  
8 **COMPANY'S PROPOSAL IS DISCRIMINATORY BECAUSE IT**  
9 **CREATES A NEW CLASS FOR NEM CUSTOMERS. DO YOU**  
10 **AGREE?**

11 A. No. Quite the contrary is true. It is the current rate structure for NEM  
12 customers that is discriminatory since it under-recovers revenues from NEM  
13 customers and over-recovers them from other customers, thereby creating an  
14 unfair and unsustainable revenue shift.

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16 **12. Q. ARE THE COMPANIES' PROPOSALS CONSISTENT WITH THE**  
17 **PRINCIPLES OF SIMPLICITY, UNDERSTANDABILITY AND**  
18 **CUSTOMER ACCEPTABILITY?<sup>16</sup>**

19 A. Yes. Demand charges can be explained in very simple terms to residential  
20 customers. It would be hard to find a residential customer who has not  
21 encountered a light bulb. When buying or installing a light bulb, the customer  
22 had to choose a bulb that would project a certain amount of light. It was then  
23 that the customer would have encountered the power of the bulb expressed in  
24 watts, the unit of power or demand. The wattage would have been expressed  
25 as 40 watts, 60 watts, 75 watts or 100 watts (or their equivalent, if the bulb  
26 was a compact fluorescent or LED bulb). Some wattages would have been

27 <sup>16</sup> Woolf Direct at 34, lines 10 and below.



1 higher, for three-way bulbs, such as 50, 100, and 150; or 100, 200 and 250. It  
2 would be difficult to find a customer, in other words, who has not encountered  
3 the concept of watts. Earlier in life, perhaps in a high school class, the  
4 customer would have also learned the concept of a kilowatt-hour and it would  
5 have been explained with a simple example such as: if you leave a 100 watt  
6 bulb on for an hour, then you consume 100 watt-hours and if you leave that on  
7 for 10 hours, you consume 1,000 watt-hours, which is termed a kilowatt-hour  
8 (kWh). In other words, most if not all consumers acquire their knowledge of  
9 kWh from the concept of watts, and not the other way around. It is fair to say  
10 that for most consumers a kWh can only be understood if it is viewed as the  
11 summation of watts over a period of time. Similarly, when a customer buys an  
12 electric hair dryer or an electric iron, they look at the power rating of that  
13 equipment which is again expressed in watts. Finally, if that customer had  
14 purchased a high wattage hair dryer and a high wattage electric iron, and  
15 decided to run both at the same time, they may have tripped the circuit breaker,  
16 requiring a trip to the garage to reset if after one of the two had been  
17 unplugged. That is yet another way through which customers become familiar  
18 with the concept of demand or capacity. All of this would be true *a fortiori* for  
19 NEM customers since they would have encountered the concept of watts  
20 (probably kW's) once again when they purchased or leased their solar panels  
21 since that is the measure in which the size of the panels is expressed.

22  
23 **13. Q. DO DEMAND CHARGES PROVIDE EFFICIENT PRICE SIGNALS**  
24 **TO WHICH CUSTOMERS CAN RESPOND?<sup>17</sup>**

25 A. Yes. Demand charges provide accurate price signals and have been used  
26 widely, along with fixed monthly charges and energy charges, in the industry

27 <sup>17</sup> Gilliam Direct at 54; see also Prepared Direct Testimony of Thomas R. Beach at 9.

1 for commercial and industrial rates for the better part of the last century. Their  
2 use has not been questioned in regulatory circles, and to the best of my  
3 knowledge, those customers have no issues with being charged separately for  
4 demand and energy. The primary function of the demand charge is to  
5 accurately convey the cost structure of electricity to customers so that they can  
6 make informed decisions about how much power to consume and at what time.  
7 Whether customers reduce demand in response to a demand charge is a  
8 secondary benefit. Moreover, there is evidence that residential customers do  
9 respond to demand charges. *See:*

- 10 • Stokke, A., Doorman, G., Ericson, T., 2009, January. An Analysis of a  
11 Demand Charge Electricity Grid Tariff in the Residential Sector,  
12 Discussion Paper 574, Statistics Norway Research Department;
- 13 • Taylor, T., Schwartz, P., 1986, April. A residential demand charge:  
14 evidence from the duke power time-of-day pricing experiment. *Energy*  
15 *Journal*.7 (2), 135–151;
- 16 • Caves, D., Christensen, L., Herriges, J., 1984. Modeling alternative  
17 residential peak-load electricity rate structures. *J. Econometrics*.;
- 18 • Thomas N. Taylor, 1982. Time-of-Day Pricing with a Demand Charge:  
19 Three-Year Results for a Summer Peak. *Award Papers in Public Utility*  
20 *Economics and Regulation*, Michigan State University Institute of Public  
21 *Utilities*, Michigan.

22 Mr. Gilliam contends that demand charges act as a fixed charge. However this  
23 ignores the variability in demand across time and across customers, which is  
24 not present with fixed charges. It also ignores the potential demand charges  
25 have for motivating customers to reduce demand. Indeed, one would expect  
26 that customers on demand charges would look for ways through which to  
27 reduce demand, bringing into effect the concept of “dynamic efficiency” cited

1 by Professor Bonbright in the second edition of his text.<sup>18</sup> Commercial and  
2 industrial customers with demand charges are aware of the value of taking  
3 action to reduce demand through changing usage patterns and utilizing  
4 equipment and technology to achieve reduction. When faced with demand  
5 charges, residential NEM customers would have the incentive to buy smart  
6 digital technologies such as thermostats, load controllers, home energy  
7 management systems and smart appliances, along with batteries and other  
8 storage options.<sup>19</sup> This will promote economic efficiency in both a static and  
9 dynamic sense.

10  
11 **14. Q. DOES IT APPEAR THAT REVENUE ADEQUACY PLAYS A**  
12 **SIGNIFICANT ROLE IN THE COMPANIES' PROPOSALS?**<sup>20</sup>

13 A. No. Again, the evidence is to the contrary. The Companies file general rate  
14 cases every three years under Nevada law. Sierra's next general rate case  
15 (GRC) will be filed June 1, 2016. Thus, the cost-shifting that occurs under  
16 existing NEM1 rates and rules directly affects full requirements customers  
17 when the under recovery of revenues from NEM customers is offset by over  
18 recovery of revenues from non-NEM customers. The rationale for the  
19 Companies' proposal is to reverse the inequity between NEM and non-NEM  
20 customers, not between NEM customers and the utility, as is made clear in the  
21 Companies' rebuttal testimony.

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25 <sup>18</sup> The eighth attribute of a sound rate structure, dynamic efficiency, involves "promoting innovation and  
26 responding economically to changing demand and supply conditions." Bonbright, second edition, page 384.

<sup>19</sup> Many ways of creating demand flexibility are discussed in this report from the Rocky Mountain Institute.  
27 [http://www.rmi.org/electricity\\_demand\\_flexibility](http://www.rmi.org/electricity_demand_flexibility).

<sup>20</sup> Woolf Direct at 29, lines 8-9.

1       **15.    Q.    DOES MR. BEACH UNDERESTIMATE THE INTELLIGENCE OF**  
2       **THE AVERAGE CUSTOMER?<sup>21</sup>**

3       A.    Yes. As I explained in response to question 10, customers have the background  
4       skills and ability to understand demand charges. I would like to add that more  
5       than a hundred thousand customers of Arizona Public Service (“APS”) are on  
6       demand charges. APS has been offering these rates to its residential customers  
7       since the very early 1980s.<sup>22</sup> In other words, long before the advent of  
8       advanced metering infrastructure (“AMI”), customers were able to  
9       comprehend the notion of demand and benefit from being on such a rate. With  
10      AMI, this should become a lot easier. The APS experience contradicts Witness  
11      Beach’s assertion (page 9, line 11-13), that “such a structure is not  
12      understandable or workable for residential or small commercial customers  
13      who spend only a few minutes a month focused on their utility bills.” It would  
14      be particularly untrue for NEM customers who for either financial or  
15      environmental reasons have taken the time to understand the economics of  
16      installing rooftop solar panels and have made the decision to go solar. One  
17      would have to be “energy literate” in order to make such a time and financial  
18      commitment.

19  
20      To support his arguments, Mr. Beach misrepresents the findings of two  
21      studies, only one of which he attaches to his testimony, drawing conclusions  
22      that are not supported by the data. Firstly, Mr. Beach claims that a 2013 study  
23      commissioned by the three major investor owned utilities in California,  
24      concluded,

25  
26      <sup>21</sup>     Beach Direct at 6, lines 7-15.

27      <sup>22</sup>     Leland Snook and Meghan Gabel, “There and back again: Why a residential demand rate developed forty  
28      years ago is relevant again,” Public Utilities Fortnightly, November 2015, forthcoming.

1                    *“A demand charge ‘was confusing’ to participants, who ended up making*  
2                    *inaccurate comparisons to a fixed monthly service fee because they failed to*  
3                    *comprehend that a demand charge ‘varies based on kW demand levels’.”<sup>23</sup>*

4  
5                    This is factually incorrect since at no stage were customer understandings of  
6                    demand charges investigated. Mr. Beach selectively quotes extracts from  
7                    commentary by the study authors and presents this information as a result of  
8                    the survey. The reality is that in a conjoint analysis, investigating relative  
9                    preferences for various rates, the study found that demand charges were  
10                   relative unimportant in rate plan selection. Rather the presence of a “monthly  
11                   service fee had more influence on rate choice than any other attribute”,  
12                   followed by “the price per kWh associated with different rate structures rather  
13                   than by the rate structure itself.”<sup>24</sup> To explain this result, the study authors  
14                   speculated,

15  
16                   *“[It is] possible that [the] concept [of demand charges] was confusing and*  
17                   *respondents did not understand that it varies based on kW demand levels,*  
18                   *which made demand charges appear low relative to a monthly service fee.”<sup>25</sup>*

19  
20                   This is commentary, not fact, and only one possible explanation for why  
21                   demand charges had little impact on rate plan selection

22  
23                   Mr. Beach also misleadingly quotes from another study conducted in 2015 by  
24                   SDG&E. Mr. Beach alleges that,

25  
26                   <sup>23</sup> Prepared Direct Testimony of R. Thomas Beach, Crossborder Energy”, p.6  
27                   <sup>24</sup> Hiner & Partners, Inc. “RROIR Customer Survey – Key Finding”, April (2013) slide 18  
28                   <sup>25</sup> Hiner & Partners, Inc. “RROIR Customer Survey – Key Finding”, April (2013) slide 22

1                   *“The survey concluded that for customers the key drawbacks of the demand*  
2                   *charge are that it is ‘confusing’, ‘unpredictable (may pay more),’ and ‘can be*  
3                   *difficult to change behavior’ to reduce their maximum 15 minute demand.”*<sup>26</sup>  
4

5                   In the line above this quote, the same study says that the pros of demand  
6                   charges are that they can, “save money (through changing behavior), give  
7                   control over the bill”.<sup>27</sup> Moreover the same page of the study listed  
8                   “confusing” as a negative attribute of all four of the rates examined in the  
9                   study--a feed in tariff; a demand charge, a solar capacity charge and a panel  
10                  rate (where you are billed by the size of circuit panel for delivery).<sup>28</sup> In fact  
11                  when one looks at how customers rated the four plans on simplicity (“Does  
12                  not require a lot of effort to understand how my energy use will affect my  
13                  bill.”), there is very little variation in the results. Twenty-eight percent of  
14                  customers found the feed in tariff plan (which involves only kWh) to be  
15                  simple, 26% found the installed capacity charge and the panel rate to be simple  
16                  and 24% found the demand charge to be simple.<sup>29</sup> It is also worth noting that  
17                  the study in question referred to hourly demand charges,<sup>30</sup> not 15 minute  
18                  demand charges as Mr. Beach states.

19  
20                  Moreover, Mr. Beach makes the concept of demand charge out to be more  
21                  complicated than it need be, describing it as, “the first derivative of energy  
22                  with respect to time.”<sup>31</sup> This seems to suggest that unless customers were  
23                  literate in differential calculus, the concept of a demand charge would elude

24                  <sup>26</sup> Prepared Direct Testimony of R. Thomas Beach, Crossborder Energy”, p.7

25                  <sup>27</sup> Hiner & Partners, “Final Report: Solar (NEM) Rate Preferences Survey Results”, (June 2015) slide 8

26                  <sup>28</sup> Hiner & Partners, “Final Report: Solar (NEM) Rate Preferences Survey Results”, (June 2015) slide 8

27                  <sup>29</sup> Hiner & Partners, “Final Report: Solar (NEM) Rate Preferences Survey Results”, (June 2015) slides 20-

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<sup>30</sup> Hiner & Partners, “Final Report: Solar (NEM) Rate Preferences Survey Results”, (June 2015) slide 21

<sup>31</sup> “Prepared Direct Testimony of R. Thomas Beach, Crossborder Energy”, p.6.

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them. One could easily describe a kWh in similar terms as “the integral of instantaneous demand over time” and insist that customers should only pay a fixed charge rather than deal with such complex concepts as kWh.

**16. Q. DOES THE 2013 STUDY FROM ONTARIO, CANADA SUPPORT THE CONCLUSION THAT DEMAND CHARGES WILL CONFUSE CUSTOMERS?<sup>32</sup>**

A. No. Mr. Marcus cites a 2013 focus group study conducted for the Ontario Energy Board (OEB) in Ontario, Canada, to validate claims that demand charges are difficult for consumers to understand. This study, based on focus groups with fewer than 40 Ontarian consumers, obfuscates the issue by:

1. Giving a poorly defined and poorly explained definition of demand charges.
2. Providing a rationale and explanation of demand only *after* soliciting opinions on demand charges.

The study explains demand charges to customers in the following way:

*“I want to ask you one more question. And that is about determining what to charge based on how much you consume during peak hours. Imagine that this would be calculated based on the maximum during the peak hours as defined for Time of Use. This could be the one-time maximum reached at any point in the year or average of the 5 highest days. What’s your reaction to that?”<sup>33</sup>*

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<sup>32</sup> Prepared Direct Testimony of William P. Marcus at 10.  
<sup>33</sup> The Gandalf Group, “Ontario Energy Board Distribution Charge Focus Groups, Final Report”, (October 2013) p.21

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This definition does not mention what the maximum is or how it would be measured (over seconds or hours?) The explanation does not mention the link between demand and energy such that customers who conserve in the peak period will still save on their energy charges, even if demand is high for a particular period. Furthermore, this maximum is over the course of a year and does not vary by month, giving customers little opportunity to learn and adapt their behaviors.

After discussing demand charges, the study moderator then goes on to explain the concept of demand using a water pipe analogy.<sup>34</sup> The study authors initially found that customers did not understand what the delivery charges on their bill were for,

*“Few could articulate what they get for delivery. The infrastructure behind the system is simply not top of mind. It is not easy to visualize let alone value.”<sup>35</sup>*

However, after explaining the concept of demand using a water pipe analogy, the study authors found that it was,

*“Helpful at building understanding of costs to the system that result from peak demand. This analogy effectively conveyed the idea that we need a bigger system to deliver more power at once.”<sup>36</sup>*

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<sup>34</sup> The Gandalf Group (2013): “Ontario Energy Board Distribution Charge Focus Groups, Final Report”, p.22  
<sup>35</sup> The Gandalf Group (2013): “Ontario Energy Board Distribution Charge Focus Groups, Final Report”, p.5  
<sup>36</sup> The Gandalf Group (2013): “Ontario Energy Board Distribution Charge Focus Groups, Final Report”, p.6



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Customers experience the concept of demand in other services that they purchase. There is no reason to believe that customers cannot understand the concept of electric demand when motivated and educated to do so.

**17. Q. IS IT INHERENTLY MORE ACCURATE TO INCLUDE A DEMAND CHARGE IN AN ELECTRIC PRICING STRUCTURE THAN IT IS TO CONSTRUCT A PRICING STRUCTURE BASED ON KILOWATT HOURS?<sup>37</sup>**

A. Yes. Mr. Beach states on page 18 of his testimony, lines 20-21 that “a customer with a demand of 4 kW is really just using 1 kWh of energy every 15 minutes.” This assumes that the customer has a load factor of 100 percent, *i.e.*, that the load shape is flat. That is rarely going to be the case for residential loads. TASC witness Monsen acknowledges that the Companies’ costs fall into at least three separate categories: fixed, demand and energy based. Developing a pricing structure that tracks these categories of costs is inherently more accurate than a more attenuated structure. For the same reason, a two-part electric pricing structure is inherently more accurate than a one-part pricing structure.

**18. Q. DO YOU AGREE WITH WITNESS MARCUS (PAGE 4, LINES 6-11) THAT SOLAR SHOULD BE TREATED LIKE ANY OTHER COMMODITY, NOT REQUIRING THE PAYMENT OF FIXED CHARGES OR STANDBY CHARGES?**

A. No. Solar customers are connected to the grid and have to pay for their use of it. The analogy with buying vegetables while growing some of your own is invalid for that very reason. Currently, electricity cannot be stored in an

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<sup>37</sup> Beach Direct at 18, line 23.

1 effective, affordable way for most customers. Solar customers are partial  
2 requirement customers and should pay for the valuable and necessary grid  
3 services that they receive. Mr. Gilliam’s testimony recognizes the need for  
4 these grid services. “For example, when a refrigerated air conditioner turns on,  
5 there is a spike in demand that can be quite high relative to a typical PV array  
6 as shown Chart 1 below.”<sup>38</sup>

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8 **19. Q. WITNESS MARCUS (PAGE 11, LINES 19-23) SUGGESTS THAT IF A**  
9 **DECISION IS MADE TO ROLL OUT DEMAND CHARGES TO**  
10 **RESIDENTIAL CUSTOMERS, “THE ELECTRIC UTILITY SHOULD**  
11 **TELL AFFECTED CUSTOMERS NOT TO TURN THEIR TOASTER,**  
12 **HAIR DRYER AND MICROWAVE ON AT THE SAME TIME ON**  
13 **WINTER MORNINGS, TO BUY GAS STOVES AND GAS DRYERS**  
14 **INSTEAD OF ELECTRIC STOVES AND DRYERS THAT COULD**  
15 **CAUSE DEMAND CHARGES TO SPIKE UP; TO BUY MORE**  
16 **EFFICIENT AIR CONDITIONERS THAT USE LESS**  
17 **INSTANTANEOUS POWER; NOT TO INVEST IN WEATHERIZING**  
18 **THEIR HOUSES.” DO YOU AGREE WITH HIS**  
19 **RECOMMENDATIONS?**

20 A. Yes, to a certain extent. I believe that customers who are choosing to install a  
21 PV array on their rooftop and who therefore will be moved on to a rate  
22 structure that includes a demand charge should be provided information about  
23 the demand of their major loads and provided tips on how to prevent the  
24 simultaneous running of several of the major loads. However, advising them  
25 to replace their electric appliances with gas appliances simply because they  
26 are now on a demand rate would not be reasonable. Customers have to make

27 <sup>38</sup> Gilliam Direct at 14.

1 their own decisions on what is cost-effective and what is not cost-effective  
2 when making their appliance purchase decisions. With a demand charge, they  
3 would be paying a lower price for the consumption of electric energy and that  
4 would have to be factored into the appliance purchase decision. Similarly, they  
5 may still find it cost-effective to weatherize their homes because the energy  
6 charges will still be there for running their electric air conditioning and gas  
7 charges will still be there for gas space heating. It is also important to  
8 recognize that the firms selling a product – *e.g.*, entities that sell distributed  
9 renewable generating systems – have an even greater responsibility than the  
10 electric utilities to educate customers about the consequences of their selection  
11 of an optional, partial requirements service.

12  
13 **20. Q. DO YOU AGREE WITH THE CLAIMS BY SOUTHERN NEVADA**  
14 **HOME BUILDERS WITNESS REN ANDERSON THAT NV**  
15 **ENERGY’S RATE PROPOSAL VIOLATES THE RATEMAKING**  
16 **PRINCIPLE OF EFFICIENCY?<sup>39</sup>**

17 A. No. As explained earlier, cost reflective rates will provide the correct price  
18 signal to promote efficiency. Dr. Anderson’s contention is that the proposed  
19 rates discourage residential consumers from buying new solar homes because  
20 they are too complex to explain. That overlooks the fact that buying a new  
21 home is a complex interaction that requires mastery of a number of  
22 complicated topics such as financing, building materials, design, number of  
23 stories, and so on. It is hard to imagine that solar customers, who are already  
24 familiar with the concepts of capacity since the size of their solar panels is  
25 expressed in kW, are unable or uninterested in investing the relatively small  
26 amount of time needed to understand the proposed new rate. Dr. Anderson

27 <sup>39</sup> Direct Testimony of Ren Anderson on Behalf of Southern Nevada Home Builders, p.6

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does not provide support for his contention. Both examples that he gives of declining solar home sales arise not because of the proposed new NEM rate but because of *uncertainty* over the future of the NEM rate and the federal income tax credit.<sup>40</sup> Delaying NEM rate changes to the next GRC will prolong this uncertainty.

**21. Q WHAT ARE YOUR RECOMMENDATIONS TO THE COMMISSION?**

A. I recommend that the Commission approve the standard and optional rates for NEM2 customers that have been proposed by the Companies. As I have argued in my testimony, the proposed rates are a significant improvement over the NEM1 rates. The NEM1 rates, which are largely volumetric in nature, do not reflect the cost structure of delivering electricity to customers which Bonbright informs us is the “most widely accepted canon of fair pricing, the principle of service at cost.”<sup>41</sup> Consequently, they send out inefficient price signals and also create inequities between NEM customer and non-NEM customers by creating a revenue shift from the former to the latter. The NEM cap has been reached, and NEM1 rates have achieved their objective, which was to stimulate customer interest in rooftop panels. They have outlived their usefulness, and it is time to replace them or be subject to what Bonbright called “the tyranny of the status quo.”<sup>42</sup> The NEM2 rates are progressive and forward-looking tariffs that satisfy the Bonbright criteria of efficiency, equity and gradualism. They are clearly laid out in terms that should be understandable to NEM2 customers. They will let prospective NEM2 customers make informed choices about whether or not to install rooftop solar panels without creating a situation where they end up being subsidized by non-

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<sup>40</sup> Direct Testimony of Ren Anderson on Behalf of Southern Nevada Home Builders, p.6  
<sup>41</sup> Bonbright, second edition, 397.  
<sup>42</sup> Bonbright, second edition, 187.

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NEM customers. In sum, the Companies' proposals should be approved, since they take into consideration the principles of rate stability, efficiency, equity, as well as the principles of simplicity, understandability, public acceptability and feasibility of application.

**22. Q. DOES THIS CONCLUDE YOUR PREPARED REBUTTAL TESTIMONY?**

A. Yes, it does.

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AFFIRMATION

STATE OF California )  
COUNTY OF San Francisco ) ss.


I, AHMAD FARUQUI, do hereby swear under penalty of perjury the following:

That I am the person identified in the attached Prepared Testimony and that such testimony was prepared by me or under my direct supervision; that the answers and information set forth therein are true to the best of my knowledge and belief; and that if asked the questions set forth therein, my answers thereto would, under oath, be the same.



AHMAD FARUQUI

Subscribed and sworn to before me  
this 3rd day of November, 2015.



*Please see attached document*

NOTARY PUBLIC

**CALIFORNIA JURAT WITH AFFIANT STATEMENT**

**GOVERNMENT CODE § 8202**

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- See Statement Below (Lines 1-6 to be completed only by document signer[s], *not* Notary)

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Signature of Document Signer No. 1

Signature of Document Signer No. 2 (if any)

A notary public or other officer completing this certificate verifies only the identity of the individual who signed the document to which this certificate is attached, and not the truthfulness, accuracy, or validity of that document.

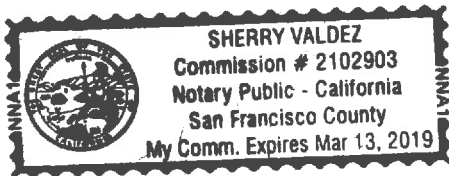
State of California  
 County of San Francisco

Subscribed and sworn to (or affirmed) before me  
 on this 3rd day of November, 2015,  
 by \_\_\_\_\_  
Date Month Year

(1) AHMAD FARUQUI

(and (2) \_\_\_\_\_),  
Name(s) of Signer(s)

proved to me on the basis of satisfactory evidence  
 to be the person(s) who appeared before me.



Signature \_\_\_\_\_  
Signature of Notary Public

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 Place Notary Seal Above

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