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September 5, 2017

Via Electronic Filing

Public Utility Commission of Oregon
Attn: Filing Center
201 High St. SE, Suite 100
Salem OR 97301

Re: In the Matter of PORTLAND GENERAL ELECTRIC CO.
2017 Request for a General Rate Revision
Docket No. UE 319

Dear Filing Center:

Please find enclosed the Cross-Reply Testimony and Exhibit of Bradley G. Mullins (ICNU/500 - ICNU/501) on behalf of the Industrial Customers of Northwest Utilities.

Thank you for your assistance. If you have any questions, please do not hesitate to call.

Sincerely,

/s/ Jesse O. Gorsuch
Jesse O. Gorsuch

Enclosures

BEFORE THE PUBLIC UTILITY COMMISSION
OF OREGON

UE 319

In the Matter of	)
	)
PORTLAND GENERAL ELECTRIC COMPANY,	)
	)
Request for a General Rate Revision	)
	)

CROSS-REPLY GENERAL RATE CASE TESTIMONY OF BRADLEY G. MULLINS

ON BEHALF OF THE
INDUSTRIAL CUSTOMERS OF NORTHWEST UTILITIES

September 5, 2017

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Exhibit ICNU/501 - SB 838 Energy Efficiency System Benefits by Rate Schedule

I. INTRODUCTION

Q. PLEASE STATE YOUR NAME AND ADDRESS

A. Bradley G. Mullins, 333 S.W. Taylor St, Suite 400, Portland, Oregon 97204.

Q. ARE YOU THE SAME BRADLEY G. MULLINS THAT PREVIOUSLY SUBMITTED TESTIMONY IN THIS MATTER?

A. Yes. I previously filed testimony in this matter on behalf of the Industrial Customers of Northwest Utilities ("ICNU").

Q. WHAT IS THE PURPOSE OF YOUR CROSS REPLY TESTIMONY?

A. I respond to the Rebuttal Testimonies of the Staff of the Oregon Public Utility Commission and the Oregon Citizens' Utility Board ("CUB") on the treatment of energy efficiency in the marginal cost of service study of Portland General Electric ("PGE", or the "Company"). Specifically, I respond to Staff witness Dr. Kaufman, who discusses the theory of the Oregon Citizens' Utility Board ("CUB") that large customers, with loads more than one average megawatt ("aMW"), are currently recognizing undue allocation of the system benefits provided by Senate Bill ("SB") 838 energy efficiency funding.[1/] I also respond to Staff witness Mr. St. Brown, who discusses CUB's proposal that customers whose load exceeds 1 aMW should credit small customers for the benefit small customers provide to the system.[2/]

Q. PLEASE SUMMARIZE YOUR TESTIMONY.

A. Contrary to the CUB's theory, there has been nothing presented in this matter showing that large customers are receiving an unfair allocation of the system benefits associated with SB 838 energy efficiency measures. CUB's analysis only identifies a value for SB 838 energy efficiency embedded in rates, and then reallocates this value to customer classes based on SB

1/ Staff/1600 at 2:1-12:2.
2/ CUB/200 at 6:8-7:14.

838 funding levels. It does not consider the impact of SB 838 energy efficiency on the system. As the information presented in Dr. Kaufman's Rebuttal Testimony shows, however, the marginal cost of service study is allocating more than 100% of the benefits of SB 838 energy efficiency to the small customer classes eligible to receive SB 838 energy efficiency funding. I've prepared some additional analysis confirming the results of the Staff analysis, below.

I have also reviewed Mr. St. Brown's Rebuttal Testimony surrounding an embedded cost differential calculation for SB 838 energy efficiency and have concluded that his analysis is largely moot, due to the fact that large customers are prohibited from receiving SB 838 funding. In addition, his analysis applied the embedded cost differential formula to all SB 838 energy efficiency. If such an approach were to be used it should apply only to the SB 838 energy efficiency that is received by large customers with loads greater than one aMW.

II. ALLOCATION OF ENERGY EFFICIENCY BENEFITS

Q. WHAT DID STAFF CONCLUDE WITH RESPECT TO CUB'S THEORY ON SB 838 ENERGY EFFICIENCY?

A. As discussed at length in this matter, the CUB theory is that large customers, with loads greater than one aMW, are currently receiving a portion of the system benefits associated with SB 838 energy efficiency through the rates established in the marginal cost of service study.[3/] After reviewing the CUB arguments, Staff concluded that the CUB theory is not valid under current circumstances.[4/] Like ICNU, Staff concluded that the marginal cost of service study appropriately allocates the system benefits of energy efficiency to the customer classes

[3/] Id.
[4/] Staff/1600 at 4:4-10.

performing the energy efficiency.[5/] It follows that, since large customers may not perform energy efficiency measures using SB 838 funding, the mechanics of the marginal cost of service study prevent the system benefits of SB 838 energy efficiency from being allocated to the rates paid by large customer classes.[6/] Contrary to the CUB theory, the Staff analysis actually showed that large customers are being allocated more costs as a result of SB 838 energy efficiency.[7/]

Q. WHAT WAS THE BASIS FOR STAFF'S RECOMMENDATION?

A. Dr. Kaufman developed a hypothetical where he considered how the marginal cost of service study allocates the system benefits associated with SB 838 energy efficiency.[8/] In that hypothetical, he demonstrated one of the intended outcomes of using long-run marginal costs as the basis for cost allocation in Oregon. As CUB has previously recognized in the context of energy efficiency, a principal objective of using long-run marginal costs as the basis for cost allocation is to provide customers with the appropriate incentive, i.e. *benefit*, associated with performing energy efficiency.[9/] The Staff study demonstrated that, under a wide range of assumptions, the marginal cost of generation study allocates more than 100% of the system benefits associated with energy efficiency to the rate schedule performing the energy efficiency measure.[10/]

5/ Id. at 6:7-7:12 (Dr. Kaufman refers to the rate-spread and rate-design model, which I refer to generically as the marginal cost of service study).

6/ Id.

7/ Staff/1601 at 5 (Showing the change in costs allocated to Schedules 89 and 90).

8/ Staff/1600 at 6:7-7:12.

9/ See In re Northwest Natural Gas Company, dba NW Natural, Request for a General Rate Revision, UG 221, CUB/100 at 12:1-16:24.

10/ Staff/1601 at 1.

Q. WERE YOU ABLE TO CONFIRM THE RESULTS OF STAFF'S ANALYSIS?

A. Yes. Table 1-CR, below, estimates the actual benefits recognized by each rate schedule due to SB 838 energy efficiency. Exhibit No. ICNU/501 has also been prepared to provide further information underlying these calculations.

TABLE 1-CR
Allocation of SB 838 Energy Efficiency System Benefits by Rate Schedule
($000)

Schedule	Actual: With SB 838 EE	Counterfactual: No SB 838 EE	Benefit / (Cost) of SB 838 EE
7	522,296	546,245	23,949
15	842	922	80
32	96,758	101,402	4,644
38	1,725	1,883	159
47	1,523	1,595	72
49	4,649	4,838	189
83	170,912	177,472	6,560
85	169,679	175,882	6,203
89	34,156	34,031	(125)
90	85,399	85,087	(313)
91/95	2,601	3,031	431
92	152	160	8
Total System	**1,090,691**	**1,132,548**	**41,856**
		Assumed SB 838 EE MWh:	1,178,778
		Assumed SB 838 Marginal Cost ($/MWh):	35.51

Q. PLEASE SUMMARIZE THE RESULTS OF TABLE 1-CR.

A. Table 1-CR estimates total system benefits of approximately $41.8 million associated with SB 838 energy efficiency. This amount is based on the SB 838 energy efficiency levels assumed CUB's testimony, adjusted to include Staff's provision for 12% capacity contribution in relation to the marginal cost of capacity.[11/] Notwithstanding these benefits, the amount of cost

[11/] See Staff/1700 at 9:2-4.

allocated to small customers as a result of SB 838 energy efficiency declined by $42.3 million.[12/] Thus, more than 100% of the system benefits of SB 838 energy efficiency are currently being recognized by small customers.

Q. HOW DID YOU ESTIMATE TOTAL SYSTEM COSTS IN THE COUNTERFACTUAL?

A. Similar to Staff's model, marginal cost data was used to estimate what system costs would have been in the counterfactual scenario. Under the marginal cost approach, one estimates what the total system costs would have been in the absence of SB 838 energy efficiency by adding to the known system costs the marginal energy and capacity cost savings associated with SB 838 energy efficiency. While I view this is an acceptable approach, it is still an estimate. It is not possible to know the actual cost of resources that the Company might have acquired in the absence of the SB 838 energy efficiency. It is possible that the actual resources the Company would have acquired would have been more expensive than suggested by the current long-term marginal cost curves, in which case customers over 1 aMW would have been allocated even more system costs.

I also assumed a 12% capacity contribution for energy efficiency based on my understanding of the Staff testimony. This is a parameter that represents a large source of uncertainty with respect to determining the system benefit of energy efficiency. I would note however, that even if the analysis were to assume 100% capacity contribution, the analysis still shows that large customers are not being allocated any system benefit in connection with SB 838 energy efficiency.

[12/] Obtained by summing the benefit allocated to all rate schedules other than Schedules 89 and 90.

Q. HOW DID YOUR ANALYSIS DETERMINE THE COST ALLOCATION BETWEEN RATE SCHEDULES?

A. For my analysis, I assumed that each rate schedule has performed SB 838 energy efficiency in proportion to the degree to which each rate schedule funds energy efficiency. That is, since residential customers pay 56.5% of SB 838 funding, I assumed that the residential class performed 56.5% of SB 838 energy efficiency. In CUB Exhibit 202, it shows, however, that small customer classes are only performing 35.8 % of SB 838 energy efficiency. This indicates that residential customers are probably paying for more energy efficiency than the benefit they are receiving, although it is the other small customers that are receiving the benefits of that energy efficiency, not large customers.

Q. ARE THE RESULTS IN TABLE 1-CA SURPRISING?

No. The marginal cost of service study functions by allocating the embedded cost of generation, based upon the long-run marginal cost that each rate class produces on the system. It works under the assumption that, if on the margin, the load of a customer class is contributing a certain percentage the total system costs, that customer class should be allocated the same percentage of embedded costs.[13/]

Presently, the marginal cost of generation is less than the embedded cost of generation. In the context of the marginal cost of service study, this means that a reduction in loads and demand due to energy efficiency will result in a reduction in the system costs allocated to a rate schedule by an amount greater than the long-term marginal energy and capacity benefit of that energy efficiency. The fact that marginal costs are lower than embedded costs is also not surprising, at least with respect to generation, as there are a number of costs embedded in

[13/] See In re Investigation of Methods for Estimating Marginal Cost of Service for Electric Utilities, Docket UM 827.

customer rates from older plant that exceed what a new (i.e., marginal) generation resource would cost. This also suggests that it is unlikely the marginal cost will exceed the embedded cost in the future, and thus potentially provide system benefits to large customers from SB 838 energy efficiency were this to occur.

Q. DOES YOUR ANALYSIS INDICATE THAT LARGE CUSTOMERS ARE BENEFITTING FROM SB 838 ENERGY EFFICIENCY?

A. No. Since the benefits that small customers receive from reduced allocation exceeds the system benefits of SB 838 energy efficiency, it means that large customers must pay more in rates as a result of the SB 838 energy efficiency being performed by small customer classes.

There is an important distinction to realize in terms of the certainty of the analysis with respect to customers over 1 aMW and customers under 1 aMW, however. Because we know that customers over 1aMW do not receive any funding from SB 838, we also know that they are not receiving the system benefits associated with this energy efficiency, as the above analysis, and Staff's analysis, shows. We do not, however, know the extent to which customer classes under 1 aMW are benefitting from or subsidizing each other. CUB's testimony indicates that a residential customer who installs an energy efficiency measure shifts costs to other residential customers.[14/] It may also be the case that, if residential customers are paying more into the SB 838 fund than they receive from it, and vice versa for commercial customers, there are cross subsidies occurring. Those issues, however, are not relevant to CUB's position in this case, which relates exclusively to supposed subsidies to customers over 1 aMW. Because we know that these customers are not receiving any funding from SB 838, the above

[14/] CUB/200 at 16.

analysis conclusively confirms that they are not receiving any system benefits and are, in fact, being allocated greater system costs.

Q. ARE THERE OTHER REASONS WHY CUB'S CONCERNS RELATED TO COST ALLOCATIONS BETWEEN CUSTOMER CLASSES UNDER 1 AMW IS PROBLEMATIC?

A. Yes. While there has been a lot of data presented in this matter to reasonably estimate the total system costs in the counterfactual scenario, determining the allocation impacts to customer classes in the counterfactual requires data underlying the actual energy efficiency that each rate schedule has performed using SB 838 funds. The Energy Trust of Oregon ("ETO"), however, does not track SB 838 energy efficiency by rate schedule. The lack of SB 838 energy efficiency data by rate schedule makes it practically impossible to develop a reasonable estimate of how costs would be allocated among these rate classes in the counterfactual scenario. That is why both the Staff analysis and my analysis rely on hypotheticals. Thus, even if the SB 838 allocations to customer classes under 1 aMW were relevant, there is insufficient data for CUB to support any claim of inequity. Again, however, the most important point is that these hypotheticals are only relevant with respect to an analysis of cost-shifting among customer classes below 1 aMW. They do not impact the analysis of whether customers over 1 aMW are receiving a system benefit from SB 838 energy efficiency.

Q. ARE THERE CIRCUMSTANCES IN WHICH STAFF BELIEVES AN ALLOCATION CHANGE MIGHT BE NECESSARY TO ADDRESS THE REQUIREMENTS OF SB 838?

A. Staff describes two scenarios in which there might be a need to address equity concerns between large and small customer energy efficiency funding. First, Staff suggests that if the marginal cost of energy and capacity were to increase significantly, large customers could receive some benefits from SB 838 funding. Staff notes that this first scenario is unlikely,

since these marginal costs would need to more than double from their current level. Second, Staff also suggests that, if the ETO were to modify its current practice of using SB 838 funding to fund large customer energy efficiency, that could also lead to a scenario where the cost allocation methodology might need to be changed.

Q. DO YOU AGREE WITH THESE SCENARIOS?

A. I agree that if the marginal system cost were to increase significantly and unexpectedly, such that marginal costs exceeded embedded system costs, then large customers might receive some allocation benefits from SB 838 energy efficiency. I disagree, however, that this unlikely scenario would require a change to the allocation methodology. Any system benefits allocated to large customers would be incidental to the marginal cost of service study and would appropriately be considered an indirect benefit. It would be asymmetrical and inequitable to allow large customers to pay additional system costs under the current construct, but prohibit them from receiving additional system benefits if circumstances change.

Q. IF LARGE CUSTOMERS WERE TO RECEIVE SB 838 ENERGY EFFICIENCY FUNDING, WOULD THAT BE A REASON TO CONCLUDE THAT LARGE CUSTOMERS ARE RECEIVING ALLOCATION BENEFITS?

A. It is a moot point, since large customers are prohibited from receiving SB 838 energy efficiency funding under the law and no party has suggested that this prohibition is being violated. As I understand the Staff position, it is basically arguing that under the scenario where large customers are provided with SB 838 energy efficiency funding, some of the simplifying assumptions necessary to estimate the cost allocation in the counterfactual can no longer be made. At that point, one can no longer assume that large customers do not perform energy efficiency measures with SB 838 energy efficiency for the purposes of disproving the CUB theory. Notwithstanding, there is insufficient class level energy efficiency data to

determine whether large customers are receiving any indirect benefits under such a hypothetical, where the funding limitations are change.

Q. ARE THERE OTHER INCREMENTAL BENEFITS OF ENERGY EFFICIENCY NOT INCLUDED IN THE STAFF MODEL?

A. Staff suggests that its model did not consider the cost of RPS compliance, transmission and distribution costs.[15/] CUB's rebuttal testimony makes similar allegations regarding the myriad other factors that it might have considered in its analysis of the system benefits of energy efficiency.[16/] The marginal cost of service study, however, is already designed to capture all of the incremental benefits of energy efficiency, with the exception of the benefits not included in the cost of service for the Company. The cost of RPS compliance, for example, is already reflected in the marginal cost of energy in the marginal cost of generation study. This was a change that Staff requested and the Company adopted in Docket UE 294. Similarly, the incremental benefits of transmission, distribution, and other miscellaneous costs are also already accounted for separate from generation in the marginal cost of service study. Other potential benefits CUB identifies, such as lower market prices and reduced environmental compliance costs, are insufficiently known and measurable at this time to include in an analysis of system benefits. Further, in Opening Testimony, CUB's analysis was focused only on the system cost of generation production, and did not argue that the cost allocation of these other system costs was being performed in an unfair manner. Accordingly, no analysis has been done in this matter to determine cost impacts of SB 838 energy efficiency on these other cost categories, which may have differing marginal cost profiles than generation.

15/ Staff/1600 at 11:4-11.
16/ CUB/200 at 2:4-4:24.

III. STAFF'S ALTERNATE COST DIFFERENTIAL MODEL

Q. HAVE YOU REVIEWED STAFF'S ALTERNATE COST ALLOCATION MODEL?

A. Yes. Mr. St. Brown proposes an allocation approach he refers to as an embedded cost differential, similar to what is currently done with respect to the embedded cost differential used by PacifiCorp for the purposes of interjurisdictional cost allocation.[17/]

Q. WHEN WOULD THE STAFF MODEL APPLY?

A. Staff basically argues that an embedded cost differential approach might be reasonable, but only if large customers were able to receive energy efficiency funding through SB 838 funds.

Q. IS IT POSSIBLE FOR LARGE CUSTOMERS WITH LOADS GREATER THAN 1 AMW TO RECEIVE SB 838 ENERGY EFFICIENCY FUNDING?

A. No. Large customers are prohibited from receiving energy efficiency incentive funding through SB 838 funds. Accordingly, the Staff model is largely moot.

Q. NEVERTHELESS, ARE THERE PROBLEMS WITH THE STAFF MODEL?

A. There are several problems with Mr. St. Brown's model. Foremost, the Staff model applies the cost differential formula against the entire amount of SB 838 energy efficiency, even though Staff has demonstrated that all of the benefits of SB 838 energy efficiency are being recognized by small customers through the marginal cost of service study, as long as those large customers do not receive any funding from SB 838. Accordingly, if an approach such as Staff's were to be used, it would need to be restricted to cover only the incremental energy efficiency funding that large customers receive from SB 838 funds, in the event that the law changed to make it possible for large customers to receive SB 838 funds.

17/ Staff/1700 at 1:11-19.

Under the Staff model, it demonstrated that large customers do not receive benefits from SB 838 energy efficiency as long as they don't receive any incentive funding from SB 838 funds. Once a single dollar of SB 838 funds is received by large customers, however, it would trigger the full effect of the cost differential formula Staff proposes, even though the benefit of the incremental dollar of SB 838 energy efficiency is relatively small. Accordingly, if Staff's approach were to be used, it should only reallocate the system benefits of the incremental energy efficiency savings achieved by large customers using SB 838 funds.

Q DOES THIS CONCLUDE YOUR CROSS-REPLY TESTIMONY?

A. Yes.

BEFORE THE PUBLIC UTILITY COMMISSION

OF OREGON

UE 319

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	)
PORTLAND GENERAL ELECTRIC COMPANY,	)
	)
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	)

EXHIBIT NO. ICNU/501

SB 838 ENERGY EFFICIENCY SYSTEM BENEFITS BY RATE SCHEDULE

	(a) Actual: With SB 838 EE				(b) Counterfactual: No SB 838 EE				(b) - (a) Rate Class Benefits of SB 838 EE			
Sch.	**Load**	**Demand (MW)**	**Marginal Cost %**	**Allocated Gen. Cost ($000)**	**Load**	**Demand**	**Marginal Cost %**	**Allocated Gen. Cost ($000)**	**Load**	**Demand**	**Marginal Cost %**	**Allocation Benefit / (Cost) ($000)**
7	8,078,715	1,729	47.89%	522,296	8,744,238	1,738	48.23%	546,244.53	665,523	9	0.34%	23,949
15	17,540	2	0.08%	842	19,898	2	0.08%	921.81	2,357	0	0.00%	80
32	1,670,046	279	8.87%	96,758	1,798,389	281	8.95%	101,401.51	128,343	2	0.08%	4,644
38	32,198	4	0.16%	1,725	36,323	4	0.17%	1,883.45	4,125	0	0.01%	159
47	22,769	6	0.14%	1,523	24,773	6	0.14%	1,594.90	2,004	0	0.00%	72
49	70,046	17	0.43%	4,649	75,349	17	0.43%	4,838.07	5,303	0	0.00%	189
83	2,986,909	477	15.67%	170,912	3,170,290	480	15.67%	177,472.24	183,381	3	0.00%	6,560
85	3,065,104	449	15.56%	169,679	3,239,882	452	15.53%	175,881.72	174,778	2	-0.03%	6,203
89	659,052	82	3.13%	34,156	659,052	82	3.00%	34,031.27	0	-	-0.13%	(125)
90	1,672,622	200	7.83%	85,399	1,672,622	200	7.51%	85,086.68	0	-	-0.32%	(313)
91/95	54,173	7	0.24%	2,601	66,901	7	0.27%	3,031.20	12,728	0	0.03%	431
92	3,040	0	0.01%	152	3,276	0	0.01%	160.37	236	0	0.00%	8
	18,332,214	3,251	100.00%	1,090,691	19,510,992	3,267	100.00%	1,132,548	1,178,778	16	0.00%	41,856