BEFORE THE PUBLIC UTILITY COMMISSION

OF OREGON

UE 335

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

OPENING TESTIMONY OF

DR. BENJAMIN FITCH-FLEISCHMANN

ON BEHALF OF THE

NORTHWEST AND INTERMOUNTAIN POWER PRODUCERS COALITION

June 6, 2018

I. INTRODUCTION

Q. Mr. Fitch-Fleischmann, please state your name and business address.

A. My name is Benjamin Fitch-Fleischmann. My business address is 121 Hickory Street, Missoula, Montana 59801.

Q. Please state your occupation and on whose behalf you are testifying.

A. I am a Senior Economist with Ecosystem Research Group, LLC. I am appearing on behalf of the Northwest and Intermountain Power Producers Coalition ("NIPPC").

Q. Please explain NIPPC's interest in this proceeding.

A. NIPPC is a membership-based advocacy group representing electric market participants in the Pacific Northwest. NIPPC's membership includes independent power producers, Electricity Service Suppliers ("ESS") and transmission companies. An ESS is a third party that provides energy for direct access customers. NIPPC is committed to facilitating cost-effective electricity sales, offering consumers choice in their energy supply, and advancing fair, competitive power markets. NIPPC generally supports direct access because it fosters competitive power markets and competition benefits all consumers by driving prices lower.

Q. Please describe your background and experience.

A. A summary of my education and work experience can be found in NIPPC/101.

Q. What is the purpose of this testimony?

A. This testimony describes several major concerns that NIPPC has with Portland General Electric Company's ("PGE") proposed changes to its direct access program and recommends that the Oregon Public Utility Commission (the

"Commission") deny PGE's proposed changes. I also recommend that the Commission relax the current 300 MWa cap on direct access in PGE's territory by increasing it to 400 MWa or alternatively establishing an annual cap of 50 MWa, and lower the eligibility threshold from 200 kW to 35 kW.

Q. What changes did PGE propose to its direct access program?

A. PGE proposes to significantly increase the transition adjustment charges that customers who switch from PGE's cost of service ("COS") rates to direct access must pay.[1] PGE also proposes certain standards that it suggests would ensure "reasonable" energy scheduling, and then proposes to establish a mechanism to decertify any ESS that does not schedule energy according to those standards.[2]

Q. Please summarize your testimony with respect to PGE's proposal to decertify an ESS based on its scheduling performance?

A. I agree with PGE that an ESS should schedule energy in a manner that is reasonably consistent with the net load of its customers, and that it is theoretically possible that significant differences between loads and the energy scheduled by an ESS could pose challenges for PGE.

However, PGE posits that there may not be energy available on the market for PGE to fill-in when an ESS has under-scheduled energy, which may then create a reliability issue on its system. To avoid this concern, PGE proposes that any ESS who does not meet new energy scheduling standards could be decertified. This would be an excessively severe consequence because PGE's concern is simply misplaced, given how rarely—according to PGE's own metric—ESSs

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1 PGE/1300, Macfarlane-Goodspeed/40, line 1-3.
2 PGE/1300, Macfarlane-Goodspeed/41, line 10-12.

under-schedule the delivery of energy (these frequencies are discussed below) and the relatively small amount of PGE's direct access load. Thus, PGE overstates the degree to which current ESS scheduling may be considered unreasonable. PGE also speculates without evidence about the probability that poor ESS scheduling will harm COS customers and raises misplaced concerns about the potential magnitude of the costs that could result from ESS scheduling imbalances, given that, as PGE explains, the Federal Energy Regulatory Commission ("FERC") approved "[Imbalance Service] Schedule 4R compensates PGE if the energy necessary to cover imbalances is available on the market."[3]

In short, the standards that PGE proposes to trigger decertification of an ESS are arbitrary, unrelated to the potential costs that PGE alleges may be incurred by COS customers, and unsupported by any analysis or evidence.

Q. Is it important that end use customers who choose or are forced to remain on COS rates, and who do not have the ability to purchase power from third parties, are not harmed by cost shifts when another customer switches to direct access?

A. Yes. It is a core principle for NIPPC that customers with the ability to directly access the market not harm the remaining captive customers. I fully support the notion that direct access customers should pay, or be credited for, the benefits or costs that their departure has on remaining COS customers.

Q. How do you respond to PGE's proposal to increase costs to direct access customers?

A. PGE proposes to extend its transition adjustment charge from five to ten years without offering any evidence to suggest that existing transition adjustment

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[3] NIPPC/102, Fitch-Fleischmann/3 (PGE Response to Calpine DR 008.a).

charges are insufficient to compensate COS customers for the impact of a customer choosing to use direct access. Given PGE's forecasts of capacity deficits and load growth, it would be unreasonable to extend the transition charges beyond the current five-year period, as PGE proposes. This is because, under current conditions, the departure of a customer from COS to direct access may very well help PGE *reduce* its need for new resources. Moreover, PGE's generation costs six to ten years out are not yet fixed and thus there is more than enough time for PGE to incorporate expectations about the size of future direct access loads into any decisions about procurements during that time.

Q. What do you recommend?

A. I recommend that the Commission deny PGE's request to increase transition adjustment charges for direct access customers, and I recommend that the Commission direct PGE to incorporate a capacity credit into its transition adjustments to ensure that direct access load is appropriately compensated if in fact its departure benefits PGE's COS customers by helping PGE avoid costs associated with the addition of new generation resources.

I also recommend that the Commission deny PGE's request to establish a mechanism to decertify ESSs. I make this recommendation based on the fact that PGE has not provided any evidence that ESS scheduling causes legitimate concerns about reliability. Furthermore, to the extent that ESS scheduling practices could affect costs to PGE, the Company should rectify this issue under FERC Imbalance Service Schedule 4R, which is the mechanism designed to settle any cost discrepancies associated with ESS mis-scheduling and is therefore the appropriate venue to address this concern.

Q. How is your testimony organized?

A. I first explain PGE's stated concerns and present several calculations, which reveal that PGE has over-stated the reliability-related concerns that it associates with ESS scheduling practices. I then explain how PGE's proposal to increase transition adjustment charges for direct access customers is inappropriate and lacks any supporting evidence and therefore should be denied.

II. <u>PGE's Proposal to Create New Scheduling Standards and Then Decertify ESSs Who Do Not Meet Those Standards</u>

Q. What is PGE's main concern about ESS scheduling?

A. PGE states that "poor scheduling may affect PGE's reliability" and "could contribute to decreased reliability" if ESSs under-schedule at a time when the market "may not have energy available." [4] PGE also expresses the concern that its COS customers "may be harmed by covering the costs of providing energy to make sure the direct access customers are served."[5]

Q. Does PGE believe that FERC-approved Schedule 4R under-collects PGE's actual costs of providing imbalance services?

A. No, PGE agrees that Schedule 4R fully compensates PGE for the costs of providing imbalance services to ESSs.[6]

Q. By what metric does PGE propose to judge an ESS's scheduling performance?

A. PGE proposes to judge ESS scheduling based on the percentage of hours in which the ESS's scheduled energy deviates from its customers' load by more than 20

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4 PGE/1300, Macfarlane-Goodspeed/42, lines 13-14 and 18; NIPPC/102, Fitch-Fleischmann/8 (PGE Response to Calpine DR 016.b).

5 PGE/1300, Macfarlane-Goodspeed/42, lines 11-13.

6 NIPPC/102, Fitch-Fleischmann/3 (PGE Response to Calpine DR 008).

percent. PGE further proposes to establish a mechanism to decertify an ESS if it exceeds this 20 percent threshold during more than 20 percent of the hours in a given month.

Q. Is this an appropriate metric for assessing scheduling performance?

A. No. It is an unfortunate composition of arbitrary thresholds that fails to reflect the harm that a scheduling imbalance may impose on PGE, which should be measured in megawatts ("MW") or megawatt hours ("MWh"). In other words, PGE's proposal to establish a scheduling standard based on the size of an ESS's scheduling imbalance relative to the ESS's load bears no relationship to the actions PGE would need to take to correct the imbalance. For example, if an ESS has a scheduling imbalance during a particular hour of, say, 50 MW, the effect on PGE is the same whether this represents five percent of the ESS's load, or 50 percent, or 100 percent. In each of these cases, PGE would need to correct a 50 MW deviation and the percent relative to the ESS's load is irrelevant. Thus, PGE's proposed scheduling standard is seriously flawed. Despite this problem with PGE's proposed metric, I use this measure in the following analysis to evaluate ESS scheduling because that is the format of data PGE has provided.

Q. Does PGE present evidence that suggests that ESSs frequently under-schedule and thus require PGE to provide additional energy or threaten PGE's reliability?

A. No. In fact, the data that PGE provides suggest that ESSs very rarely under-schedule energy. The following information was provided by PGE:[7]

[7] NIPPC/102, Fitch-Fleischmann/11 (PGE Response to Calpine DR 024).

Percent of Hourly Deviations Greater than 20% where ESS is Short (under-scheduled)					
	17-Dec	17-Nov	17-Oct		
ESS-1	5.4%	0.1%	0.0%		
ESS-2	0.0%	0.0%	0.1%		
ESS-3	0.0%	0.0%	0.0%		
ESS-4	0.0%	0.0%	0.0%		
ESS-5*	N/A	N/A	N/A		
*Proposed scheduling requirement not applicable to ESS with <10 MWa of energy					

The table above shows that for the three months and four ESSs for which PGE provides data, PGE's proposed metric indicates that there was one month in which one ESS was more than 20 percent short, in 5.4 percent of hours. But additional data provided by PGE show that this ESS scheduled a total of only 71 MWh that fell outside the +/- 20 percent band during this month.[8] In no other instances did an under-scheduling error of more than 20 percent occur for any ESS more than 0.1 percent of the time. I also calculate that the total MWh that fall outside PGE's proposed +/-20 percent band for these four ESSs equates to only 0.82 percent of total ESS customer load, on average.[9]

Q. How do ESS scheduling imbalances compare to other sources of scheduling uncertainty that PGE regularly manages?

A. To provide a reference to answer this question, I calculate that during the instances when an ESS scheduling imbalance exceeded the +/-20 percent threshold proposed by PGE, the average excursion outside this band was only approximately 3.65 MW at any given time.[10] By comparison, using PGE's Load

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8 NIPPC/102, Fitch-Fleischmann/1 (PGE First Supplemental Response to Calpine DR 005).

9 NIPPC/103, Fitch-Fleischmann/1

10 Id.

Data for Open Access Same-Time Information System Posting,[11] I calculate that PGE's peak load forecast was off, on average, by approximately 115 MW (or 4.2 percent).[12] In other words, the average ESS error as measured by PGE's proposed metric, of 3.65 MW is quite small compared to PGE's average peak load forecast error of 115 MW.

Q. Does PGE have to settle each individual ESS's imbalance?

A. No, PGE does not need to settle each individual ESS's potential imbalance. It is the *net* position of ESSs in aggregation that PGE must settle, in combination with the rest of PGE's system. Deviations between the energy that ESSs schedule and the loads they serve are just one source of variation among many—including net load and variability in wind and solar production—that PGE regularly balances. Similar to the diversity benefits associated with renewable resources, there is nothing that guarantees that an individual ESS's scheduling imbalance may not in fact be compensating for imbalances or deviations elsewhere on PGE's system.

Q. Does PGE present any evidence about the frequency with which the *net* ESS position is short?

A. No. The only information PGE presents about the net position of ESSs are monthly totals or statistics, which do not indicate how frequently the *net* ESS position is short. However, on average, ESSs delivered *more* energy than their customers use—approximately 3,000 MWh more per month—over the time period for which PGE has provided data.[13] This information cannot be used to

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[11] NIPPC/102, Fitch-Fleischmann/4-6 (Provided in PGE Response to Calpine DR 015, Attachment A).

[12] NIPPC/104, Fitch-Fleischmann/1

[13] Id.

infer the frequency with which the *net* ESS position is short; however, it indicates that the *average* position is long (i.e., ESSs are delivering more energy than their customers are using, on average).

Q. What evidence does PGE present about the frequency with which it has not been able to supply the energy needed to correct an ESS scheduling imbalance?

A. None. PGE stated that to assemble such evidence would be "unduly burdensome."[14]

Q. Does PGE identify any reliability problems that have occurred as a result of ESS scheduling?

A. No. PGE objected to a request for such information on the grounds that it would be "unduly burdensome" and instead explains that "PGE does not investigate reliability events to the level of detail that would be required to assign cause specifically to ESS scheduling behaviors." So, while the premise of PGE's proposal to decertify ESSs for violating a specific scheduling standard is based upon reliability concerns, PGE has presented no evidence at all to demonstrate that its concern is real. Nor has PGE provided any evidence that its existing imbalance tariff is insufficient to fully manage any ESS imbalances that may occur.

Q. Has PGE provided any evidence that any reliability problems could occur as a result of ESS scheduling?

A. No. In addition to not identifying instances of concern revealed by historic scheduling events that could potentially have caused a reliability problem, PGE's testimony and data responses are devoid of any information demonstrating what

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[14] NIPPC/102, Fitch-Fleischmann/7 (PGE Response to Calpine DR 016.a).

manner of ESS scheduling imbalance could theoretically cause a reliability problem.

Q. Given that PGE has not presented *any* evidence supporting its claims that ESS scheduling may cause reliability concerns, and that there is another mechanism through which PGE satisfactorily recovers costs it occurs for providing imbalance services, what do you recommend?

A. I recommend that the Commission deny PGE's request to establish new scheduling standards and deny PGE's request to establish a mechanism to decertify an ESS that does not meet those standards.

III. PGE's Proposal to Increase Transition Adjustment Costs for Direct Access Customers

Q. What is PGE's proposed change to the transition adjustment charges imposed on direct access customers?

A. PGE proposes to effectively double the transition adjustment charges associated with fixed generation costs by extending it from five years to ten years.

Q. What justification does PGE offer for proposing this cost increase?

A. PGE states that it will "help protect remaining COS customers from undue cost shifting."[15]

Q. Does PGE present evidence of any undue cost shifting?

A. No. Instead, PGE points to PGE Exhibit 1308, which simply demonstrates that the fixed generation revenues that it would receive from a customer who opts for long-term direct access would be twice as big if the charges were assessed for twice as long, i.e., ten years instead of five years. It is true, of course, that if PGE collects transition charges for twice as long, the revenues it collects will be twice as much—and if they extended the charges for 20 years, the revenues would be

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15 PGE/1300, Macfarlane-Goodspeed/40, lines 9-10.

four times as much. But, this does not in any way suggest that there is undue cost shifting or that existing transition adjustment charges are insufficient. PGE has only provided analyses of how its revenue would increase under the proposed change; it has not provided evidence of changes in harm or costs to COS customers that would justify the proposed change in revenue.

Q. Does PGE present evidence suggesting that transition adjustments should be charged for ten years, as it proposes, rather than the current five years?

A. No, PGE does not present any analysis that examines what the appropriate time period is for assessing these charges.

Q. Do you believe five years is the appropriate time period over which to assess transition adjustment charges?

A. I believe five years is more than enough time to allow a utility to adjust its portfolio to account for departing direct access customers and thereby avoid incurring costs associated with serving those customers. To extend these charges to the period six to ten years after the direct access customer leaves COS rates, as PGE proposes, would be inappropriate because it would impose charges beyond a sufficient planning window over which a utility ought to be able to manage its procurement plans to account for the departing load.

Q. Does PGE offer any other reasons in support of applying transition adjustments for ten years?

A. Yes, PGE states that to do so would "more closely [align] PGE's Schedule 129 transition adjustments with PacifiCorp's long-term opt-out program."[16]

Q. Do you believe PGE's transition adjustment charges should be closely aligned with PacifiCorp's?

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[16] PGE/1300, Macfarlane-Goodspeed/40, lines 11-12.

A. No. PGE provides no rationale as to why its transition adjustment charges should align with PacifiCorp's long-term opt-out program and PGE provides no evidence that supports the idea that its system and service territory are so similar to PacifiCorp's that their transition adjustments should be aligned.

Q. What do you recommend with respect to transition charges given that PGE is expected to need new resources in the coming years?

A. PGE's projections of load growth and capacity deficits show that PGE expects its capacity deficit to rise from 100 MW in 2021-2023 to over 1,000 MW in 2031.[17] This means that the departure of load from COS rates could help PGE avoid some of the need for new resources. Given this, there may be good reason to re-evaluate whether the five-year period of transition charges is in fact too long and whether PGE's direct access customers should be credited for departing from COS rates. Indeed, if transition adjustments were to be extended beyond five years, it would amplify the importance of re-evaluating whether direct access customers should receive a credit for helping to reduce PGE's capacity needs.

Q. You state that the five-year transition charge may be too long and PGE's direct access customers should potentially receive a credit for departing from COS rates. Please explain.

A. The five-year period for assessing transition charges is more than sufficient to provide a utility with time to adjust their resource procurement plan in response to changes in their COS load. If a utility is considering capacity additions, which could be needed *but for* the departure of some load from COS to direct access, then I recommend that the transition adjustment include a capacity credit to reflect

[17] NIPPC/102, Fitch-Fleischmann/10 (PGE Response to Calpine DR 020, Attachment A).

the benefit provided to the system from a customer switching to direct access and thus reducing the need for incremental generation resources. One way to do this would be to credit the direct access customer based on a comparison of its load profile with capacity values established for comparable variable resources in a utility's most recent Integrated Resource Plan. PGE has recently proposed a capacity credit for customers that elect to take service under its proposed voluntary renewable energy tariff ("VRET"), as filed in Docket UM 1690.[18] In that docket, PGE states that "If PGE is resource deficient at the time of program subscription/resource fulfillment, we propose that participating customers be credited the value of capacity according to the then approved Schedule 201, in addition to the value of energy based on the AURORA market price forecast."[19] This same credit should be applicable to customers taking direct access service. The Commission could also open a separate investigation to consider how to calculate an appropriate capacity credit for PGE's direct access customers.

Q. Do you believe there are any other modifications to PGE's direct access program that would be appropriate at this time?

A. Yes. I believe the Commission should direct PGE to make the following additional modifications: 1) reduce the one MW eligibility requirement to 35 kW; and 2) relax the current 300 MW cap on participation.

Q. Please describe why the eligibility requirement should be reduced to 35 kW.

A. As described in PGE's testimony, PGE's original one MW eligibility threshold was put in place in 2003 "to limit the number of accounts that must be separately

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18 See UM 1690, PGE/200, Sims - Tinker/10.
19 Id., lines 10-13.

tracked, thereby helping to mitigate the administrative burden to PGE."[20] PGE now has significant experience tracking these accounts, and it is reasonable to expect that PGE's computer systems and account tracking ability have improved during the past 15 years. PGE is proposing to use 35 kW as the threshold for its VRET service, which indicates that a 35 kW threshold is not overly burdensome.

Q. Please describe why the participation cap should be increased above 300 MW.

A. This cap was originally put in place as a backstop to ensure that an excessive migration of load from COS to direct access did not cause planning problems or unexpected challenges. As these things have not occurred, it suggests that the cap is unnecessary and that, as PGE's load grows, it would be appropriate to allow for an increasing amount of load to have the option to choose direct access. This is especially important given that the program is almost fully subscribed and may be capped out soon, despite the potential capacity value to the system that would come with additional load moving from COS to direct access. One simple way for the Commission to solve this would be to consider a modest increase in this cap from 300 MWa to at least 400 MWa. I recommend, however, that the Commission instead consider establishing an annual enrollment cap of 50 MWa in order to establish an ongoing mechanism that avoids the need to continually revisit the matter.

Q. Can you summarize your recommendations?

A. Yes. I recommend that the Commission deny PGE's request to increase transition charges for its direct access customers, and I recommend that the Commission

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[20] PGE/1300, Macfarlane-Goodspeed/37, lines 1-2.

direct PGE to credit direct access customers for reducing the need for PGE to acquire new capacity resources. I also recommend that the Commission direct PGE to either establish an annual enrollment cap for direct access of 50 MWa or increase the total cap from 300 MWa to 400 MWa. The cap has not proven necessary and either of these adjustments will help to ensure new customers have the choice of direct access. Lastly, I recommend that the Commission direct PGE to lower the direct access participation threshold to 35 kW.

IV. <u>CONCLUSION</u>

Q. Does this conclude your opening testimony?

A. Yes.

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EXHIBIT NIPPC/101

SUMMARY OF EDUCATION AND WORK EXPERIENCE OF BEN FITCH-FLEISCHMANN

June 6, 2018

Q. **Please describe your educational background and work experience.**

A. I received a B.A. in economics and government from Claremont McKenna College in 2005, an M.A. in economics from the University of Montana in 2009, an M.S. in economics from the University of Oregon in 2012, and a Ph.D. in economics from the University of Oregon in 2015. I am currently Senior Economist with Ecosystem Research Group, LLC, where I work as a consultant for public agencies and private clients on economic and regulatory compliance issues related to energy and the environment. From 2016 to 2017, I was a Senior Economist with the Oregon Public Utility Commission. Prior to that, from 2015 to 2016, I was an Assistant Professor of Economics and Environmental Studies at Oberlin College. From 2012 to 2015 I was an instructor and Ph.D. candidate in economics at the University of Oregon. From 2006 to 2008, I was a consultant for ICF International working on projects for the U.S. Department of Energy, the U.S. Environmental Protection Agency, and other governmental entities. I have taught undergraduate courses on microeconomics, macroeconomics, econometrics, environmental economics, and behavioral economics.

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EXHIBIT NIPPC/102

PGE RESPONSES TO CALPINE DATA REQUESTS

June 6, 2018

May 25, 2018

TO: Greg Bass
Calpine Energy Solutions, LLC

FROM: Stefan Brown
Manager, Regulatory Affairs

PORTLAND GENERAL ELECTRIC
UE 335
PGE *First Supplemental* Response to Calpine Energy Solutions, LLC's Data Request No. 005
Dated May 25, 2018

Request:

Reference PGE/1300, Macfarlane-Goodspeed/42 at Table 8. For each ESS listed and for each month listed in the table, please provide:

(i) MWhs that fell outside the 20% band, and
(ii) total MWhs settled for the month.

Initial Response (dated April 9, 2018):

(i) The following table provides the total MWhs outside the 20% band:

	Dec-17	Nov-17	Oct-17
ESS-1	71.0	18.2	24.6
ESS-2	24.4	0.5	841.5
ESS-3	2,057.2	0.0	14.7
ESS-4	294.0	82.3	279.6
ESS-5*	N/A	N/A	N/A

(ii) The following table provides the total MWhs settled:

	Dec-17	Nov-17	Oct-17
ESS-1	274.1	521.3	250.0
ESS-2	4,773.8	829.0	11,555.5
ESS-3	1,345.2	2,171.4	2,074.8
ESS-4	653.1	191.8	1,099.1
ESS-5*	N/A	N/A	N/A

*Proposed scheduling requirement is not applicable to an ESS with less than ten MWa of energy.

First Supplemental Response (dated May 25, 2018):

Please see PGE's response to Calpine Energy Solutions, LLC's Data Request No. 025 for a correction to Table 8. Using the corrected data, PGE provides the following revision to its initial response above:

(i) The following table provides the total MWhs outside the 20% band:

	Dec-17	Nov-17	Oct-17
ESS-1	71.0	18.2	24.6
ESS-2	4.0	0.0	511.1
ESS-3	2,057.2	0.0	14.7
ESS-4	294.0	82.3	279.6
ESS-5*	N/A	N/A	N/A

(ii) The following table provides the total MWhs settled:

	Dec-17	Nov-17	Oct-17
ESS-1	274.1	521.3	250.0
ESS-2	2,121.7	-1,952.5	8,841.6
ESS-3	1,345.2	2,171.4	2,074.8
ESS-4	653.1	191.8	1,099.1
ESS-5*	N/A	N/A	N/A

April 9, 2018

TO: Greg Bass
Calpine Energy Solutions, LLC

FROM: Stefan Brown
Manager, Regulatory Affairs

PORTLAND GENERAL ELECTRIC
UE 335
PGE Response to Calpine Energy Solutions, LLC's Data Request No. 008
Dated March 26, 2018

Request:

Reference PGE/1300, Macfarlane-Goodspeed/42, stating: "PGE's COS customers may be harmed by covering the costs of providing the energy to make sure the direct access customers are served. PGE must fill in the gaps left by the ESS."

a. Does PGE agree that the purpose of the FERC-approved provisions for network transmission service Imbalance Service Schedule 4R, is to "fill in the gaps " due to scheduling versus actual usage deviations by PGE's network transmission customers, including ESSes? If not, please explain PGE's understanding of the purpose of the FERC-approved Schedule 4R.
b. Please explain how "PGE's COS customers" could be harmed when PGE collects Imbalance Service Schedule 4R charges from each scheduling ESS under the terms of the FERC-approved provisions for network transmission service.
c. Is it PGE's position that FERC-approved Schedule 4R under-collects PGE's actual costs of providing imbalance services?
d. What specific provisions of Schedule 4R are under-collecting PGE's costs for imbalance service that are then being "covered" by COS rates? Please provide all studies, documents and work papers supporting the assertion that Schedule 4R does not recover PGE's costs.

Response:

a. From a financial perspective, Schedule 4R compensates PGE if the energy necessary to cover imbalances is available on the market.
b. PGE's cost of service customers may be harmed if the energy market is not available to provide energy based on poor scheduling practices of an ESS. That harm can come in the form of decreased reliability. If curtailments become necessary, PGE cannot discriminate and curtail the direct access customers served by the offending ESS before other customers.
c. No.
d. See PGE's response to parts (a) and (b) above.

Load Data for OASIS Posting

Date: Date Range (10/01/2017 - 12/31/2017)

SYSTEM ACTUAL LOAD		
Date	**Hour Ending**	**Peak MW**
10/1/2017	20	2329
10/2/2017	20	2495
10/3/2017	20	2494
10/4/2017	20	2485
10/5/2017	20	2481
10/6/2017	9	2418
10/7/2017	20	2218
10/8/2017	20	2367
10/9/2017	20	2534
10/10/2017	20	2605
10/11/2017	20	2621
10/12/2017	20	2593
10/13/2017	9	2557
10/14/2017	10	2513
10/15/2017	20	2443
10/16/2017	8	2649
10/17/2017	19	2641
10/18/2017	19	2561
10/19/2017	19	2646
10/20/2017	11	2538
10/21/2017	19	2465
10/22/2017	20	2428
10/23/2017	20	2560
10/24/2017	20	2538
10/25/2017	8	2535
10/26/2017	20	2478
10/27/2017	8	2415
10/28/2017	19	2228
10/29/2017	19	2405
10/30/2017	20	2597
10/31/2017	8	2735
11/1/2017	19	2612
11/2/2017	19	2681
11/3/2017	19	2660
11/4/2017	19	2593
11/5/2017	18	2647

11/6/2017	19	2900
11/7/2017	18	2992
11/8/2017	18	2996
11/9/2017	18	2767
11/10/2017	18	2670
11/11/2017	18	2483
11/12/2017	18	2555
11/13/2017	19	2800
11/14/2017	18	2766
11/15/2017	18	2901
11/16/2017	18	2920
11/17/2017	18	2781
11/18/2017	18	2651
11/19/2017	18	2777
11/20/2017	18	2776
11/21/2017	18	2754
11/22/2017	18	2629
11/23/2017	12	2461
11/24/2017	18	2480
11/25/2017	18	2649
11/26/2017	18	2719
11/27/2017	19	2942
11/28/2017	19	3027
11/29/2017	19	2922
11/30/2017	18	3020
12/1/2017	18	2843
12/2/2017	18	2796
12/3/2017	19	2878
12/4/2017	19	3127
12/5/2017	19	3069
12/6/2017	19	3029
12/7/2017	19	3103
12/8/2017	8	3142
12/9/2017	18	3008
12/10/2017	19	3151
12/11/2017	19	3351
12/12/2017	8	3352
12/13/2017	19	3264
12/14/2017	18	3268
12/15/2017	18	3236
12/16/2017	18	2903
12/17/2017	20	2852
12/18/2017	18	2944

12/19/2017	18	3059
12/20/2017	19	3139
12/21/2017	18	3331
12/22/2017	18	3153
12/23/2017	19	3060
12/24/2017	18	3178
12/25/2017	18	2924
12/26/2017	18	3369
12/27/2017	18	3221
12/28/2017	18	3096
12/29/2017	18	2839
12/30/2017	19	2682
12/31/2017	18	2887

April 30, 2018

TO: Gregory Adams
Richardson Adams, PLLC

FROM: Stefan Brown
Manager, Regulatory Affairs

PORTLAND GENERAL ELECTRIC
UE 335
PGE Response to Calpine Energy Solutions, LLC's Data Request No. 016
Dated April 17, 2018

<u>Request:</u>

Reference PGE's response to Calpine Solutions' DR 008(b), stating: "PGE's cost of service customers may be harmed if the energy market is not available to provide energy based on poor scheduling practices of an ESS."

a. **Identify all times in the past decade when the energy market has not been available to supply energy in the quantities roughly equivalent to the scheduling errors PGE has experienced with ESSs.**
b. **Identify all reliability problems that have occurred in the last decade related to poor scheduling practices of ESSs, including date, nature of the problem, and PGE's solution to the problem.**
c. **Identify all instances where cost-of-service customers were curtailed due to poor scheduling practices by an ESS (or ESSs), including the date, and amount of cost-of serve load curtailed, and the details of the occurrence.**
d. **Does PGE agree that participation in the Energy Imbalance Market will decrease the likelihood that energy will be unavailable to supply imbalance service required by ESSs' scheduling errors. Please explain the basis for the response.**

<u>Response:</u>

a. PGE objects to this request on the basis that it is overly broad and unduly burdensome. PGE does not align ESS deviations to the requested detailed market information on an hourly basis. Without waiving its objection, PGE responds as follows:

   PGE has a reliability obligation to ensure that the supply of the energy on its grid is balanced to its load. When this does not occur, it can result in voltage problems, frequency deviations, and in the worst case, breaker open curtailments. PGE's obligation under the NERC Reliability Criteria is to avoid these types of events.

   As provider of last resort, when schedule and actual deviations occur, PGE responds by making economic transactions/dispatches, if possible. However, because PGE is responsible for ensuring that load and generation are in constant balance, actions may be taken that are uneconomic if necessary to ensure reliability.

If the energy market (including PGE's own generation) could not cover a sustained under-scheduling error of any size, the grid operator would ultimately have to curtail load after other contingency reserves were exhausted. Because this is not a situation that is desirable to any of the organizations involved, NERC has taken steps to ensure that there are neighboring sources of energy supply that may be called upon during constrained system operations that may normally not be available in the typical markets at substantial cost. This tiered reliability protection has prevented many curtailments in the West, which PGE has exercised as recently as 2016 when market supply was significantly constrained.

b. PGE objects to this request on the basis that it is overly broad and unduly burdensome. The definition of "reliability problems" is unclear as stated in the question. Without waiving its objection, PGE responds as follows:

There are reliability events that trigger multiple levels of response by PGE and the neighboring grid operators and energy suppliers. At this time, PGE does not investigate reliability events to the level of detail to assign cause specifically to ESS scheduling behaviors. However, as provider of last resort, PGE is aware that poor scheduling practices with ESS entities could contribute to decreased reliability and includes this consideration in its planning for load following reserves to ensure these issues are minimal. Thus, a lack of reliability events does not indicate that ESSs are submitting reasonable schedules.

c. As mentioned in response to part (a), PGE is obligated to ensure supply equals demand per the NERC Reliability Criteria. While PGE has not been forced to curtail loads on its system, PGE has triggered criteria set forth in the Reliability Coordinator's Operating Procedure (OP-301) for Capacity and Energy Emergencies to ensure that there is enough supply to meet demand.

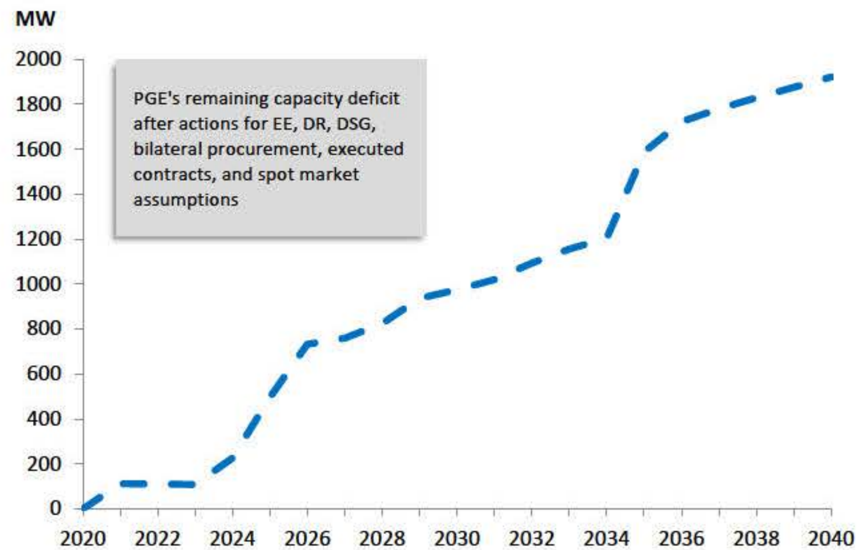
d. PGE objects to this request on the basis that it is seeking opinion and calls for speculation. Without waiving its objection, PGE responds as follows:

No, PGE does not agree. PGE's participation in the Energy Imbalance Market (EIM) provides an additional source of imbalance management to the PGE grid. Before EIM, the PGE grid operators utilized existing generation to balance hourly and 15-minute scheduling discrepancies in real time. The EIM market is using those existing generators as well as neighboring (i.e., non-PGE grid) generators, within the EIM transfer capability available between the neighbors. Thus, the EIM provides a new imbalance supply source. However, this source comes with market design constraints that can heavily influence the economics of the imbalance energy source in ways that have not been previously observed. For example, PGE EIM Entity, i.e. the transmission provider in performance of its role as an EIM Entity under the Market Operator Tariff and PGE's Open Access Transmission Tariff, aims to balance projected load and supply within +/- 1% ahead of each operating hour. During the operating hour, there can be instances when the PGE EIM Entity cannot resolve power balance infeasibilities, and the CAISO market software may apply the power balance constraint at the relaxation parameter value (i.e., $1,000/MWh for under-generation and $-150/MWh for over-generation) to resolve the infeasibility. In these instances, allocation of the cost is dependent on the schedules submitted by an ESS and PGE. If the ESSs have over-scheduled and PGEM generation was forced to back down, under scheduling charges would be applied to PGE load (and customers) and over scheduling credits would be applied to ESSs.

UE 335 PGE Response to Calpine DR No. 020
Attachment 020-A
Page 1

Year	Capacity Need (MW)
2020	0.0
2021	111.8
2022	111.4
2023	108.5
2024	225.7
2025	494.8
2026	732.6
2027	759.5
2028	824.7
2029	937.6
2030	974.9
2031	1019.6
2032	1093.7
2033	1156.3
2034	1204.3
2035	1588.7
2036	1722.4
2037	1780.4
2038	1829.6
2039	1875.7
2040	1921.6

Figure 3: Annual Capacity Deficit



May 21, 2018

TO: Gregory Adams
Richardson Adams, PLLC

FROM: Stefan Brown
Manager, Regulatory Affairs

PORTLAND GENERAL ELECTRIC
UE 335
PGE Response to Calpine Energy Solutions, LLC's Data Request No. 024
Dated May 7, 2018

Request:

Reference PGE/1300, Macfarlane-Goodspeed/42, at Table 8. Please reproduce the table reflecting only the percent of hourly deviations of greater than 20% in the hours where the ESS in question was short (i.e. scheduling and delivering less energy than actual ESS customer load).

Response:

PGE disagrees with this request because an analysis that considers only circumstances of an ESS being short, or long, will disregard the overall impacts of scheduling deviations.

Notwithstanding its disagreement, PGE provides the table below to reflect the requested changes:

	Dec-17	Nov-17	Oct-17
ESS-1	5.4%	0.1%	0.0%
ESS-2	0.0%	0.0%	0.1%
ESS-3	0.0%	0.0%	0.0%
ESS-4	0.0%	0.0%	0.0%
ESS-5*	N/A	N/A	N/A

*Proposed scheduling requirement is not applicable to an ESS with less than ten MWa of energy.

BEFORE THE PUBLIC UTILITY COMMISSION

OF OREGON

UE 335

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

EXHIBIT NIPPC/103

COMPILATION OF DATA FROM PGE RESPONSES

June 6, 2018

Compilation of Data from PGE Responses to DRs							
Added calculations in grey cells							
PGE Reply to Calpine DR 025							
Updated Table 8. Percent of Hourly Deviations Greater than 20%							
	17-Dec	17-Nov	17-Oct				
ESS-1	11.4%	5.5%	6.9%				
ESS-2	0.3%	0.0%	9.3%				
ESS-3	30.5%	0.0%	0.9%				
ESS-4	33.3%	19.2%	38.4%				
ESS-5*	N/A	N/A	N/A				
*Proposed scheduling requirement not applicable to ESS with <10 MWa of energy							
Reply To Calpine DR 024							
Percent of Hourly Deviations Greater than 20% where ESS is Short (under-scheduled)							
	17-Dec	17-Nov	17-Oct				
ESS-1	5.4%	0.1%	0.0%				
ESS-2	0.0%	0.0%	0.1%				
ESS-3	0.0%	0.0%	0.0%				
ESS-4	0.0%	0.0%	0.0%				
ESS-5*	N/A	N/A	N/A				
Reply to Calpine DR 005 - First Supplemental Response							
Total MWhs Outside the 20% Band							
	17-Dec	17-Nov	17-Oct	Average			
ESS-1	71.0	18.2	24.6	37.9			
ESS-2	4.0	0.0	5111.1	1705.0			
ESS-3	2057.2	0.0	14.7	690.6			
ESS-4	494.0	82.3	179.6	252.0			
ESS-5*	N/A	N/A	N/A				
Total	2626.2	100.5	5330.0	2685.6			
As % of Aggregate ESS Load	0.85%	0.03%	1.56%	**0.82%**			
Total MWhs Settled (i.e., net monthly energy scheduled minus energy used)							
	17-Dec	17-Nov	17-Oct	Average			
ESS-1	274.1	521.3	250.0	348.5			
ESS-2	2121.7	-1952.5	8.841.6	84.6		Hours/month	
ESS-3	1345.2	2171.4	2074.8	1863.8		736	
ESS-4	653.1	191.8	1099.1	648.0			
ESS-5*	N/A	N/A	N/A				
Total	4394.1	932.0	3423.9	**2916.7**			
As % of Aggregate ESS Load	1.43%	0.30%	1.00%	0.91%			
				Avg MW outside the +/-20% band			
				3.65			
Reply to Calpine DR 014 - First Supplemental Response							
Aggregate Load Served by ESSs (MWhs)							
	17-Dec	17-Nov	17-Oct				
	307,643.9	308,644.3	341,125.5				

BEFORE THE PUBLIC UTILITY COMMISSION

OF OREGON

UE 335

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

EXHIBIT NIPPC/104

CALCULATIONS FROM DATA PROVIDED IN PGE RESPONSES

June 6, 2018

Calculations from data provided in PGE Response to Calpine DR 015 Attachment A

Added calculations in grey cells	4.20%	Average forecast error (%)
	114.2282609	Average forecast error (MW)

Load Data for OASIS Posting

Date: Date Range (10/01/2017 - 12/31/2017)

SYSTEM ACTUAL LOAD				Forecast Error	
Date	Hour Ending	Peak MW	forecast	MW	%
10/1/2017	20	2329	2456	127	5.45%
10/2/2017	20	2495	2627	132	5.29%
10/3/2017	20	2494	2644	150	6.01%
10/4/2017	20	2485	2647	162	6.52%
10/5/2017	20	2481	2644	163	6.57%
10/6/2017	9	2418	2465	47	1.94%
10/7/2017	20	2218	2356	138	6.22%
10/8/2017	20	2367	2445	78	3.30%
10/9/2017	20	2534	2643	109	4.30%
10/10/2017	20	2605	2694	89	3.42%
10/11/2017	20	2621	2714	93	3.55%
10/12/2017	20	2593	2711	118	4.55%
10/13/2017	9	2557	2589	32	1.25%
10/14/2017	10	2513	2412	101	4.02%
10/15/2017	20	2443	2487	44	1.80%
10/16/2017	8	2649	2664	15	0.57%
10/17/2017	19	2641	2673	32	1.21%
10/18/2017	19	2561	2621	60	2.34%
10/19/2017	19	2646	2707	61	2.31%
10/20/2017	11	2538	2616	78	3.07%
10/21/2017	19	2465	2397	68	2.76%
10/22/2017	20	2428	2503	75	3.09%
10/23/2017	20	2560	2625	65	2.54%
10/24/2017	20	2538	2690	152	5.99%
10/25/2017	8	2535	2667	132	5.21%
10/26/2017	20	2478	2661	183	7.38%
10/27/2017	8	2415	2575	160	6.63%
10/28/2017	19	2228	2440	212	9.52%
10/29/2017	19	2405	2492	87	3.62%
10/30/2017	20	2597	2700	103	3.97%
10/31/2017	8	2735	2727	8	0.29%
11/1/2017	19	2612	2811	199	7.62%
11/2/2017	19	2681	2883	202	7.53%
11/3/2017	19	2660	2877	217	8.16%
11/4/2017	19	2593	2750	157	6.05%
11/5/2017	18	2647	2896	249	9.41%
11/6/2017	19	2900	3078	178	6.14%

11/7/2017	18	2992	3061	69	2.31%
11/8/2017	18	2996	3052	56	1.87%
11/9/2017	18	2767	2941	174	6.29%
11/10/2017	18	2670	2862	192	7.19%
11/11/2017	18	2483	2659	176	7.09%
11/12/2017	18	2555	2715	160	6.26%
11/13/2017	19	2800	2973	173	6.18%
11/14/2017	18	2766	2910	144	5.21%
11/15/2017	18	2901	3007	106	3.65%
11/16/2017	18	2920	2985	65	2.23%
11/17/2017	18	2781	2929	148	5.32%
11/18/2017	18	2651	2788	137	5.17%
11/19/2017	18	2777	2846	69	2.48%
11/20/2017	18	2776	2958	182	6.56%
11/21/2017	18	2754	2842	88	3.20%
11/22/2017	18	2629	2848	219	8.33%
11/23/2017	12	2461	2476	15	0.61%
11/24/2017	18	2480	2626	146	5.89%
11/25/2017	18	2649	2653	4	0.15%
11/26/2017	18	2719	2789	70	2.57%
11/27/2017	19	2942	3013	71	2.41%
11/28/2017	19	3027	3117	90	2.97%
11/29/2017	19	2922	3086	164	5.61%
11/30/2017	18	3020	3101	81	2.68%
12/1/2017	18	2843	3027	184	6.47%
12/2/2017	18	2796	2935	139	4.97%
12/3/2017	19	2878	3035	157	5.46%
12/4/2017	19	3127	3247	120	3.84%
12/5/2017	19	3069	3215	146	4.76%
12/6/2017	19	3029	3218	189	6.24%
12/7/2017	19	3103	3210	107	3.45%
12/8/2017	8	3142	3182	40	1.27%
12/9/2017	18	3008	3017	9	0.30%
12/10/2017	19	3151	3054	97	3.08%
12/11/2017	19	3351	3228	123	3.67%
12/12/2017	8	3352	3350	2	0.06%
12/13/2017	19	3264	3249	15	0.46%
12/14/2017	18	3268	3314	46	1.41%
12/15/2017	18	3236	3274	38	1.17%
12/16/2017	18	2903	3106	203	6.99%
12/17/2017	20	2852	3080	228	7.99%
12/18/2017	18	2944	3218	274	9.31%
12/19/2017	18	3059	3204	145	4.74%
12/20/2017	19	3139	3256	117	3.73%
12/21/2017	18	3331	3408	77	2.31%
12/22/2017	18	3153	3312	159	5.04%
12/23/2017	19	3060	3184	124	4.05%
12/24/2017	18	3178	3224	46	1.45%
12/25/2017	18	2924	2810	114	3.90%
12/26/2017	18	3369	3311	58	1.72%

12/27/2017	18	3221	3260	39	1.21%
12/28/2017	18	3096	3106	10	0.32%
12/29/2017	18	2839	2902	63	2.22%
12/30/2017	19	2682	2857	175	6.52%
12/31/2017	18	2887	3077	190	6.58%