



Portland General Electric Company
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PortlandGeneral.com

February 19, 2013

E-mail / US Mail

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Oregon Public Utility Commission
Attention: Filing Center
550 Capitol Street NE, #215
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**Re: UM 1610 -- INVESTIGATION INTO QUALIFYING FACILITY CONTRACTING
AND PRICING**

Attention Filing Center:

Enclosed for filing in UM 1610 are an original and five copies of:

Direct Testimony of Portland General Electric Company:

- **PGE Exhibit 200 Macfarlane / Bettis**

This document is being filed by electronic mail with the Filing Center. Hard copies will be sent via US Mail. An extra copy of this cover letter is enclosed. Please date stamp the extra copy and return it to me in the envelope provided.

This document is being served upon the UM 1610 service list.

Sincerely,

A handwritten signature in black ink, appearing to read "R. Dahlgren". The signature is fluid and cursive, written over a white background.

Randall J. Dahlgren
Director, Regulatory Policy & Affairs

RJD:jlt

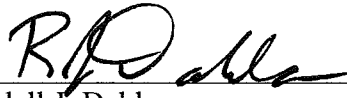
encls.

cc: UM 1610 Service List

CERTIFICATE OF SERVICE

I hereby certify that I have this day caused **PORTLAND GENERAL ELECTRIC'S**
MAP DIRECT TESTIMONY to be served by electronic mail to those parties whose email
addresses appear on the attached service list for OPUC Docket No. UM 1610.

Dated at Portland, Oregon, this 19th day of February, 2013.



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**SERVICE LIST 2/19/13
OPUC DOCKET # UM 1610**

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**BEFORE THE PUBLIC UTILITY COMMISSION
OF THE STATE OF OREGON**

**UM 1610
Investigation into Qualifying Facility
Contracting and Pricing**

PORTLAND GENERAL ELECTRIC COMPANY

Direct Testimony of
Robert Macfarlane
Ty Bettis



Portland General Electric

February 19, 2013

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I. Introduction and Summary

1 **Q. Please state your name and position with Portland General Electric Company (PGE).**

2 **A.** My name is Robert Macfarlane. I am an analyst in Pricing and Tariffs. My qualifications
3 are listed in Exhibit PGE 100.

4 My name is Ty Bettis. I am the Manager of Merchant Transmission & Resource
5 Integration. My qualifications are listed in Section II of this testimony.

6 **Q. What is Mechanical Availability Percentage (MAP)?**

7 **A.** MAP is a measure of the reliability of the renewable facility. It acts as a guarantee that the
8 unit will be available (ready to start, in working order) for a minimum agreed upon
9 percentage of time.

10 A purchase power agreement often requires the seller to specify how many MWhs the
11 plant is expected to produce each year. This output estimate can be expressed as the
12 mechanical-availability guarantee. Such an availability guarantee requires that the
13 qualifying facility (QF) be physically capable and available to produce a full output of
14 electricity a certain percentage of the time, after excluding hours lost to force majeure and a
15 certain amount of scheduled maintenance. The MAP encourages developers to maintain the
16 readiness of their equipment for the duration of the power purchase agreement (PPA).

17 **Q. Please provide a brief description of PGE's current Mechanical Availability
18 Percentage (MAP) requirement.**

19 **A.** As currently contained in Schedule 201, Standard Contract Power Purchase Agreement For
20 Intermittent Resources:

1 “Seller represents and warrants that the Facility shall achieve the following
2 Mechanical Availability Percentages (‘Guarantee of Mechanical
3 Availability’)

4 3.1.10.1 Ninety-one percent (91%) for the first Contract Year;

5 And

6 3.1.10.2 Ninety-five percent (95%) beginning Contract Year two and extending

7 throughout the remainder of the term.”

8 **Q. Does PGE recommend changes to the MAP?**

9 A. PGE recommends retaining a 91% MAP in Contract Year 1, and a 95% MAP beginning in
10 Contract Year 2 and extending to the end of the term. We do, however, recommend an
11 explicit recognition of planned maintenances as described below.

12 **Q. How were the percentages determined and why are they appropriate?**

13 A. The recommended MAP is in line with industry standards as demonstrated below and cited
14 in footnotes 1-5.

15 **Q. As currently written, is there a planned maintenance exception in PGE’s MAP?**

16 A. No.

17 **Q. Does PGE recommend a planned maintenance exception as part of the MAP?**

18 A. Yes. PGE recommends allowing up to 200 hours per unit for planned maintenance during
19 the year. The availability for the MAP calculation is then based on the remaining hours.

20 **Q. How does PGE propose “availability” be calculated?**

21 A. Calculation of “availability” should be aggregated on a turbine-by-turbine basis, rather than
22 on a project-wide basis. To clarify, if one turbine (of a multiple turbine farm) is down for
23 maintenance, but others are available, the entire plant would not be considered
24 “unavailable.” To demonstrate, we recommend a calculation similar to PacifiCorp’s, shown
25 below:

1 % Availability = $\{[(H \times N) - (\text{Sum of Downtime Hrs for } N \text{ Turbines})] / (H \times N)\} \times 100\%$

2 H = Number of hours in contract year (minus planned maintenance)

3 N = Number of turbines in the facility

4 Planned maintenance outages would not be considered part of “downtime hours” for this
5 calculation.

6 **Q. What would be considered “planned maintenance?”**

7 A. Outages scheduled 90 days in advance, with PGE’s prior written consent.

8 **Q. Is PGE’s proposal more lenient than the current MAP?**

9 A. Yes, based on total annual hours the maintenance carve out and remaining percentage
10 provide an actual MAP equivalent to 88.9% in the first year and 92.8% in all other years.
11 This compares with the current percentages of 91% in the first year and 95% in all
12 subsequent years.

13 **Q. Does PGE’s 2011 Renewable Implementation Plan cite a 92% mechanical availability
14 expectation for PGE’s Biglow Canyon Wind project?**

15 A. No. Table 3 in the 2011 Renewable Implementation Plan refers to a generic combined cycle
16 combustion turbine (CCCT) alternative to Biglow Canyon. This apparently has been
17 misinterpreted as an availability factor for the Biglow Canyon Wind project. However, 92%
18 represents the annual average expected availability of a CCCT, based on reductions for
19 scheduled maintenance and an allowance for forced outages. The 92% availability figure
20 referenced does not reflect a forecast or estimate of Biglow Canyon’s availability.

21 **Q. Is PGE’s proposed MAP achievable?**

22 A. Yes. PGE’s MAP is written to provide incentive for the efficient operation of renewable
23 QF facilities. PGE’s own wind resource – Biglow Canyon – has been able to consistently

1 achieve 95% availability without a planned maintenance exception. Further,
2 95% availability is well in line with the industry standard.

Table 1

	Phase I	Phase II	Phase III
2008	* 92.8%		
2009	96.8%	* 97.5%	
2010	95.9%	98.3%	* 92.8%
2011	96.3%	97.5%	97.4%
2012	98.5%	98.8%	98.6%

Table 1: historical availability data on the three phases of the PGE-owned Biglow Canyon wind farm. The availability percentage includes the hours actually available divided by the number of hours in the month (with no planned maintenance exception).

*First year of operation

3 **Q. Please provide evidence that a 95% MAP with a maintenance exception is within the**
4 **“industry standard.”**

5 A. In Stoel Rives’ “The Law of Wind: A Guide to Business and Legal Issues¹,” the following
6 recommendation on Mechanical Availability Guarantees is provided:

7 Typical mechanical-availability guarantees provide for a guarantee of a
8 mechanical-availability percentage in each contract year of 95 percent. The
9 mechanical availability percentage is a fraction, the numerator of which is the
10 actual number of hours in the contract year during which the turbines were
11 mechanically available for operation, and the denominator of which is the
12 theoretical number of hours during the contract year in which the turbines
13 could have been mechanically available to produce electricity.

14 Further, a survey of manufacturer data (footnotes 2,3,&4 below²³⁴) shows that major
15 companies estimate a 97% availability factor per turbine (all available hours) if the

¹ http://www.stoel.com/Files/LawOfWind_06.pdf.

² <http://www.huronwind.com/main.php?page=data>.

³ http://www.geenergyfinancialservices.com/press_room/publications/GEA14954C15-MW-Broch.pdf.

⁴ <http://www.ge-energy.com/wind>

1 QF elects to allow the manufacturer to perform maintenance. Vestas even goes so
2 far as to offer liquidated damages if 97% availability is not maintained⁵.

II. Qualifications

3 **Q. Mr. Bettis, please state your educational background and qualifications.**

4 A. I received both a Bachelor of Science degree in Business Administration and Master of
5 Science degree in Management and Organizational Leadership from Warner Pacific College.

6 I have been employed by PGE for 24 years, the last 14 years in Power Operations.
7 During my time in Power Operations, I have worked as a Prescheduler, Day-Ahead Power
8 Trader, Transmission Analyst, Variable Energy Resource Integration Analyst, and most
9 recently as the Manager of Merchant Transmission & Resource Integration. I also served as
10 the Project Manager of PGE's first two Wind Integration Studies. Currently, I am the Vice-
11 Chair of the WECC's Variable Generation Subcommittee and a member of the Board of
12 Directors for the Utility Variable-Generation Integration Group (UVIG).

13 **Q. Does this conclude your testimony?**

14 A. Yes.

⁵ <http://www.vestas.com/en/wind-power-plants/operation-and-service/service.aspx#/vestas-univers>.