

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

UE 286

Net Variable Power Cost

PORTLAND GENERAL ELECTRIC COMPANY

Rebuttal Testimony and Exhibits of

*Mike Niman
Terri Peschka
Patrick G. Hager*

June 16, 2014

Net Variable Power Costs

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I. Introduction

1 **Q. Please state your names and positions with Portland General Electric (PGE).**

2 A. My name is Mike Niman. My position at PGE is Manager, Financial Analysis.

3 My name is Terri Peschka. My position at PGE is General Manager, Power Operations.

4 My name is Patrick G. Hager. I am the Manager of Regulatory Affairs at PGE.

5 Our qualifications were previously provided in PGE Exhibit 500 in Docket No.

6 UE 283.

7 **Q. What is the purpose of your testimony?**

8 A. The purpose of our testimony is to address the testimonies of the Public Utility Commission
9 of Oregon (OPUC) Staff, the Industrial Customers of Northwest Utilities (ICNU), and the
10 Citizens' Utility Board of Oregon (CUB) filed separately in this docket.

11 **Q. What specific issues will you address in your testimony?**

12 A. We will address the following issues:

- 13 • ICNU's proposal to exclude 315 MW of the Beaver point-to-point (PTP) transmission
14 contract (Beaver PTP Contract) with Bonneville Power Administration (BPA) for
15 rights on the South of Allston path from the Trojan substation to PGE load because
16 ICNU claims it is not used and useful based on ICNU's incorrect assumptions of
17 PGE's transmission rights, uses, and obligations.
- 18 • ICNU's proposal to forecast 2015 Net Variable Power Costs (NVPC) as if PGE had
19 elected to self-integrate its wind resources at the April 2014 BPA mid-rate-period
20 election for Variable Energy Resource Balancing Service (VERBS) rather than
21 modeling PGE's actual election made for VERBS 30/60 committed scheduling.

1 **Q. What is your recommendation regarding OPUC Staff's proposal to modify the UE 228**
2 **stipulation?**

3 A. We recommend the Commission accept OPUC Staff's proposal to modify the UE 228
4 stipulation so that it does not apply to the load forecast in a power cost docket filed with a
5 general rate case

6 **Q. Has a settlement been reached on any of the issues identified by OPUC Staff, ICNU,**
7 **and CUB in their testimonies?**

8 A. Yes. PGE, OPUC Staff, ICNU, and CUB held settlement conferences on June 4 and
9 June 13 to discuss the issues identified in each party's opening testimony filed in this
10 docket. A partial settlement was reached regarding the following issues:

- 11 • ICNU's proposal to modify the modeling of thermal plant dispatch in PGE's MONET
12 model;
- 13 • ICNU's proposal to modify the forecast of 2015 Colstrip incremental wheeling
14 expense;
- 15 • ICNU's proposal to modify the forecast of 2015 Montana Beneficial Use Tax
16 expense;
- 17 • ICNU's proposal to model the Tucannon PTP transmission credits from BPA for the
18 entire 2015 test year.
- 19 • ICNU's proposal to modify the estimated energy output for the Tucannon River Wind
20 Farm (Tucannon); and,
- 21 • OPUC Staff's proposal to modify the 2015 electric and gas market forward curves.

22 PGE anticipates that the stipulation and supporting testimony will be filed by June 27, 2014.

II. ICNU's Proposed Adjustments

A. Beaver Point-to-Point Transmission Contract

1 **Q. What is ICNU's position regarding PGE's contract with BPA for transmission rights**
2 **on the South of Allston path (Beaver PTP Contract).**

3 A. ICNU's position is that 315 MW of the 531 MW Beaver PTP Contract is not used and useful
4 and it was imprudent for PGE to renew the Beaver PTP Contract for the entire 531 MW of
5 transmission rights on BPA's system for 2015 through 2020.¹

6 **Q. Is ICNU's description of PGE's transmission rights from Beaver, Port Westward 1,**
7 **and Port Westward 2 correct?**

8 A. No. ICNU's analysis assumes that PGE was the sole (i.e., 100 percent) owner of the Trojan
9 Nuclear facility (Trojan) and that PGE had transmission rights on our own system for the
10 1,130 MW name plate capacity of Trojan. In fact, PGE owned only 67.5 percent of Trojan
11 and did not have 1,130 MW of transmission rights in addition to the 531 MW Beaver PTP
12 Contract.

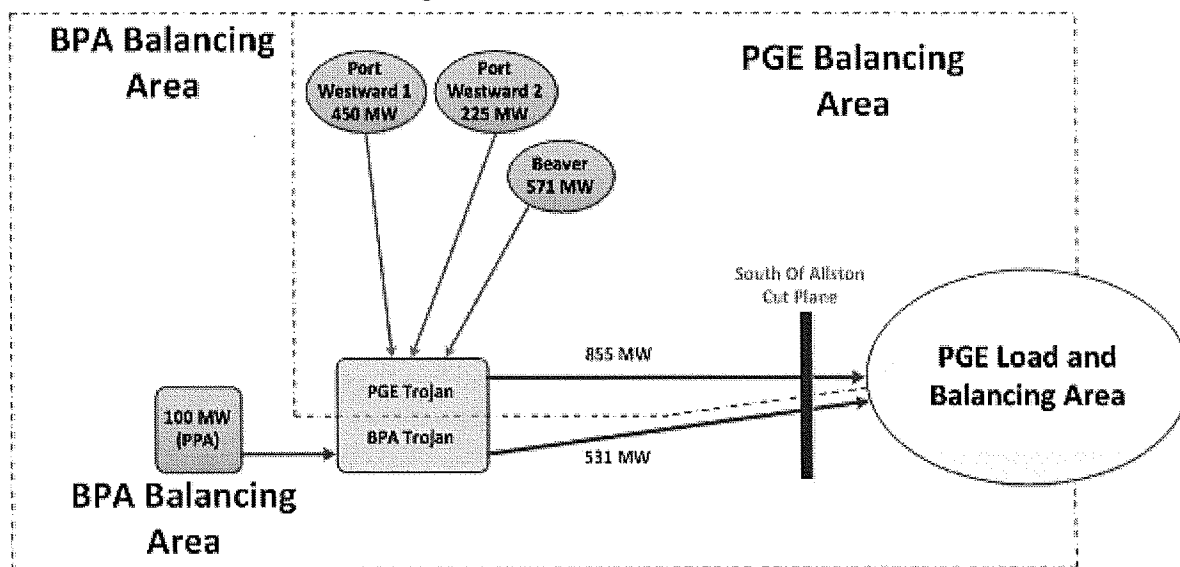
13 **Q. What are PGE's transmission rights from Beaver, Port Westward 1, and**
14 **Port Westward 2 to PGE's load and Balancing Area?**

15 A. While ICNU effectively assumes 1,661 MW of transmission rights for PGE, Figure 1 below
16 depicts PGE's transmission rights from the Trojan substation where Beaver,
17 Port Westward 1, and Port Westward 2 interconnect to the grid.²

¹ ICNU/100 Mullins/15 at 2-5.

² 1,661 MW is the sum of 531 MW and 1,130 MW.

Figure 1 - West-Side Transmission



1 As shown in Figure 1 above, PGE has 855 MW of rights on PGE’s transmission system
2 and 531 MW of rights on BPA’s transmission system. Due to the South of Allston path Cut
3 Plane, PGE’s rights on both BPA’s and PGE’s systems are subject to curtailment and
4 reduction, depending on the overall path rating, the season of the year, and other operational
5 factors.

6 **Q. Are these transmission rights used for other purposes besides delivering output from**
7 **the Beaver and Port Westward plants?**

8 A. Yes. PGE has a long-term Power Purchase Agreement (PPA) for 100 MW that is delivered
9 to PGE’s system via the Beaver PTP Contract. Additionally, PGE uses available
10 transmission rights for path management, short-term market purchases, and redirects.

11 **Q. Did ICNU’s analysis consider any of these other uses?**

12 A. No.

13 **Q. What goals does PGE have in its transmission planning?**

1 A. PGE has two goals for transmission planning: (1) maintain sufficient firm transmission
2 capacity to deliver generation to load, and (2) ensure that PGE has sufficient transmission
3 capacity to support a one-in-ten peak load event over the planning horizon. These goals are
4 often difficult to balance due to congested BPA transmission paths, delayed reinforcement
5 projects, five-year transmission rollover timeline requirements, expected generation start
6 dates, and changing forecasts. Because of these difficulties, PGE uses a portfolio approach
7 to managing its transmission portfolio in order to achieve its goals.

8 **Q. Figure 1 above indicated that PGE has 40 MW of remaining transmission rights. Are**
9 **these remaining transmission rights used by PGE?**

10 A. Yes. PGE's west-side transmission rights cross the South of Allston Cut Plane (more
11 generally, the I-5 corridor). This transmission path is one of the most used, constrained, and
12 difficult to acquire of BPA's transmission paths. Given the ability to redirect transmission
13 service on BPA's system, any transmission capacity that PGE has above a resource's
14 requirements can be redirected to any number of generation projects or suppliers to meet
15 PGE's Load Serving Entity (LSE) obligations.³ PGE uses the remaining transmission rights
16 to manage curtailment or derations on the South of Allston path, for redirects to meet other
17 transmission needs necessary to support PGE's portfolio, and for access to the Northwest
18 market.

19 **Q. Is the entire Beaver PTP Contract used and useful?**

20 A. Yes. Not only does PGE use the entire Beaver PTP Contract, but it also provides value to
21 our customers by supporting PGE's west-side generation resources, supporting a long-term

³ Due to its physical location and resource mix, PGE is must maintain a balanced transmission portfolio to ensure that its reliability and compliance obligations as an LSE are met.

1 PPA, enabling access to the Northwest market, enabling redirects to meet other transmission
2 needs to ensure reliability, and for path management.

3 **Q. Was it prudent for PGE to renew the 531 MW Beaver PTP Contract through 2020?**

4 A. Yes. Without the Beaver PTP Contract, PGE would not have sufficient transmission rights
5 to deliver generation to load, we would be more limited in our access to energy markets, and
6 our ability to maintain a reliable system for our customers would be reduced significantly.
7 By renewing the 531 MW Beaver PTP Contract, PGE ensured that the generation from our
8 resources and contracts would be reliably delivered to our system, that we have access to
9 Northwest markets, and that we are able to maintain future roll-over rights on the 531 MW
10 Beaver PTP Contract to continue to support PGE's generation and transmission portfolio.⁴

B. Wind Integration

11 **Q. Please summarize ICNU's proposal regarding wind integration.**

12 A. ICNU proposes that PGE model its 2015 NVPC to reflect the estimated net benefit of self-
13 integration as if PGE had elected to self-integrate Biglow Canyon and Tucannon for the
14 April 2014 BPA mid-rate-period election. This 2014 election would mean that PGE would
15 self-integrate beginning October 1, 2014, through September 30, 2015.

16 **Q. What election did PGE make for the April 2014 mid-rate-period election?**

17 A. As part of the BP-14 BPA rate case, BPA allowed VERBS customers to make a mid-rate-
18 period election in April 2014 for service beginning on October 1, 2014, and ending on
19 September 30, 2015. PGE decided to not self-integrate its wind for the reasons we discuss

⁴ According to BPA's Reservation Priority, Version 9 business practice, "All subsequent Renewal Requests received on or after October 3, 2008 must be for five years or longer for the Renewal Request to have Reservation Priority rights..."

1 below. As a consequence, PGE elected the 30/60 committed scheduling option for BPA's
2 VERBS for both Biglow Canyon and Tucannon.

3 **Q. Can you please briefly explain BPA's VERBS and 30/60 committed scheduling?**

4 A. Yes. Currently, Biglow Canyon Wind Farm is a part of BPA's Control Area. When
5 Tucannon begins operations it will also be a part of BPA's Control Area. Under BPA's
6 Tariff, BPA offers VERBS to customers with Variable Energy Resources (VERs), such as
7 wind, within BPA's Control Area. VERBS provides capacity reserves for regulating,
8 following, and imbalance:

- 9 • Regulating reserves are held for the moment-to-moment differences between
10 generation and load.
- 11 • Following reserves are held for the larger differences that occur over longer periods
12 of time within the hour.
- 13 • Imbalance reserves are held for differences between scheduled and actual generation
14 for the hour.

15 Under the 30/60 committed scheduling option, PGE submits a schedule 30 minutes
16 before the next hour for the forecast of the plant's output during the next hour. The forecast
17 is based on BPA's persistence forecast, which is the one minute average of generation from
18 29 to 30 minutes after the current hour. For example, PGE would submit a schedule for
19 Biglow Canyon at 2:30 pm for generation that will occur from 3:00 pm to 4:00 pm. The
20 schedule is based on a forecast that is derived by taking the average of Biglow Canyon's
21 generation from 2:29 pm to 2:30 pm.

22 **Q. Can you please briefly explain what ICNU is referring to as self-integration in their**
23 **testimony?**

1 A. Yes. In the context of ICNU’s testimony, self-integration means Biglow Canyon and
2 Tucannon would be metered as if they were located within PGE’s Control Area and PGE
3 would be solely responsible for all variations in generation (i.e., no longer a part of BPA’s
4 Control Area and not being integrated by BPA VERBS). In order to manage this variation,
5 PGE would need to hold additional reserves on our generators that would be capable of
6 responding to the three types of differences (i.e., regulating, following, and imbalance) and
7 be able to change the output of those generators accordingly with minimal notice.

8 **Q. In practice, is it required that PGE self-integrate all aspects of both Biglow Canyon
9 and Tucannon?**

10 A. No. PGE can choose to self-supply wind integration services in whole or in part. For
11 instance, we could elect to have a certain phase of one of our wind farms integrated through
12 BPA and could self-integrate the others. In the past, BPA had offered the wind integration
13 choice as an “either/or” scenario: either integrate fully through BPA or fully self-integrate or
14 procure from a third party. We could also choose to self-supply generation imbalance while
15 continuing to rely on BPA to provide the others. PGE continues to evaluate the available
16 options and pursue the least-cost, least-risk option for our customers.

17 **Q. Why did PGE elect to continue to use BPA VERBS 30/60 committed scheduling?**

18 A. There were three major drivers that led PGE to elect BPA VERBS 30/60 committed
19 scheduling:

- 20 1) The long period required for development, implementation, and testing of necessary
21 systems, software, and equipment;
- 22 2) Integration of wind must be accomplished at the portfolio level; and,

1 3) Uncertainty regarding available election options and developing markets, specifically a
2 robust sub-hourly market.

3 **Q. Can you provide more detail on the first driver identified above regarding necessary**
4 **systems, software, and equipment?**

5 A. Yes. PGE participated in BPA's 30/30 Committed Intra-Hour (CIH) Pilot Program during
6 October 1, 2011 through September 30, 2013. The 30/30 CIH Pilot Program required
7 participants to schedule their wind generation with BPA on a 30-minute basis rather than the
8 standard hourly basis. PGE's participation in the 30/30 CIH Pilot Program helped us
9 identify areas within our traditional system operations model that we must develop and
10 expand in order to successfully move toward self-integration.

11 The 30/30 CIH Pilot Program also identified a need for PGE to determine the
12 operational abilities of each generation asset, specifically thermal plants, and the impacts of
13 increased movement and cycling on these assets. After our experience with sub-hourly
14 scheduling of wind resources, PGE began to develop a plan that included the installation of
15 Automatic Generation Control (AGC) on additional generation assets, improved data and
16 communication systems, and dynamic load and dispatch tools. PGE is currently in the
17 process of implementing this plan under the Dynamic Dispatch Program (DDP). The DDP
18 consists of the following sub-projects:

- 19 • Plant Data (PI) Consolidation – Consolidates current generating plant PI systems and
20 expands a centralized PI system to include data from all generating plants.
- 21 • Cycling Cost Studies & AGC Telemetry Installation – PGE is conducting studies on
22 PGE's thermal resources to determine their cycling capabilities and the costs
23 associated with using them for integration (wear and tear, forced outage rates, etc.).

1 Based on the outcome of the cycling cost studies, PGE will install AGC at the
2 appropriate thermal plants.

- 3 • Dynamic Dispatch Tool – Develop a tool(s) that can simultaneously optimize the
4 PGE system for reliability requirements and economic dispatch of the plants. This
5 will support PGE’s ability to (a) self-integrate wind, (b) schedule wind sub-hourly,
6 (c) participate in an EIM, and (d) automatically dispatch plants more efficiently to
7 load.

8 Exhibit 201 contains a timeline of the DDP. Given the complexity of the DDP, it will
9 not be completed in time for the October 1, 2014 VERBS start date that corresponds to the
10 April 2014 mid-rate-period election due to the extensive work and testing needed to ensure
11 reliable service and to minimize the risk to various systems and generation assets. We
12 expect the DDP to be completed by October 1, 2015.

13 **Q. Please provide more detail on the second driver identified above regarding integration**
14 **of wind at the portfolio level.**

15 A. Integration of wind requires a coordinated effort across PGE’s entire resource portfolio due
16 to the high and rapid variability of wind and the increasing amount of wind generation in
17 PGE’s portfolio.⁵ Once PGE elects to self-integrate wind, PGE’s Control Area Operator
18 will be solely responsible for maintaining the reliability of PGE’s system given the increased
19 variability due to wind. Without proper preparation of PGE’s systems, additional AGC
20 capable generating facilities, and sufficient balancing resources, PGE and its customers
21 would be exposed to significant costs and risk for non-compliance with industry and region
22 reliability standards. Port Westward 2 is only one of the resources required to manage the

⁵ Tucannon will add approximately 267 MW of wind to PGE’s system.

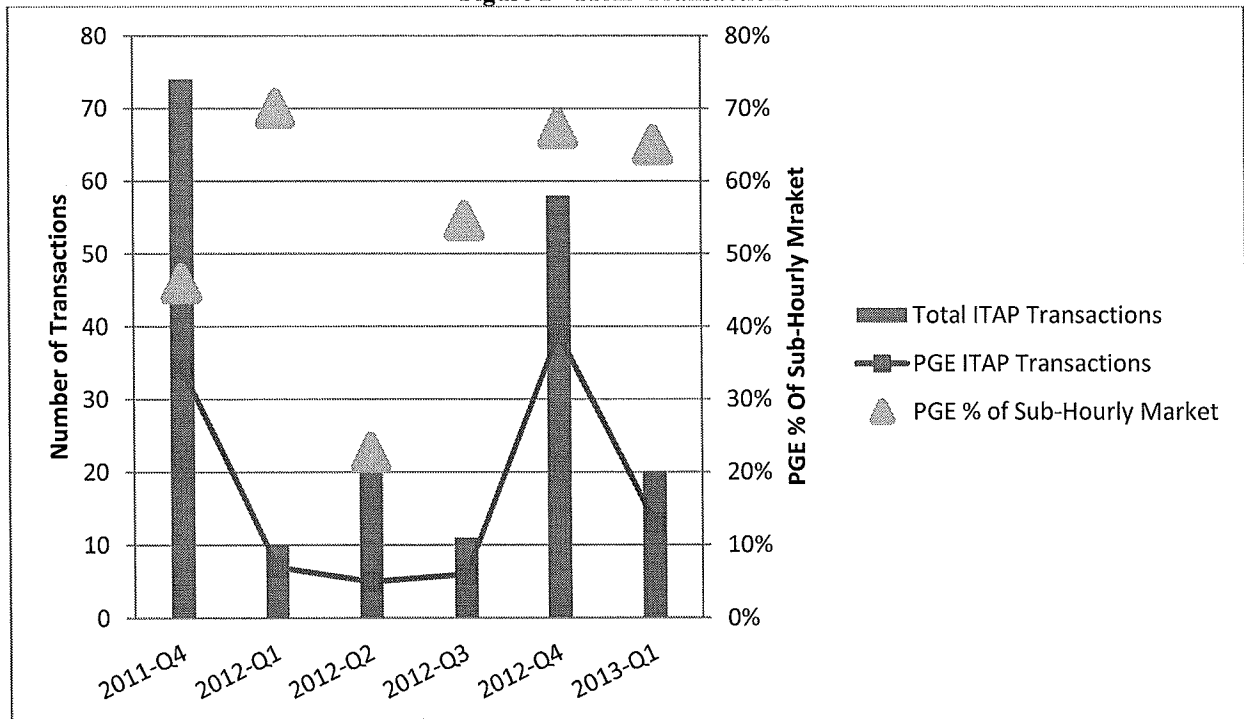
1 variability of load and the increased variability of wind to ensure efficient and reliable
2 operation of PGE’s Control Area. Although Port Westward 2 is a highly flexible resource, it
3 is not the singular balancing resource, but rather an important piece in PGE’s generation
4 fleet. In order to ensure a coordinated effort across PGE’s portfolio, AGC must be installed
5 on more generation assets and the operating range of each generation resource must be
6 accurately determined. Advanced tools are needed to plan and coordinate the dispatch of
7 generation assets. As stated above, these are the primary tasks of the DDP, which PGE is
8 currently implementing.

9 **Q. Please provide more detail on the third driver identified above regarding uncertainty.**

10 A. During the 30/30 CIH Pilot Program, PGE participated in the Interchange Transaction
11 Accelerator Project (ITAP), which is a trading platform designed to facilitate a sub-hourly
12 energy and capacity market. We found that the sub-hourly market was underdeveloped and
13 illiquid, with PGE representing a significant portion of the sub-hourly transactions that
14 occurred.⁶ Figure 2 below provides a quarterly summary of the total ITAP transactions and
15 the percentage of those transactions involving PGE.⁷

⁶ PGE continues to participate in ITAP and continues to represent a significant portion of the transactions that occur.
⁷ Presented at the December 2013 UE 266 VERBS workshop.

Figure 2 - ITAP Transactions



1 As discussed at the UE 266 VERBS workshops, ITAP and the sub-hourly market
 2 continue to develop. Regional entities provided feedback to the ITAP vendor and entered
 3 into a trial in April 2014 to evaluate the available capacity in the region. This capacity trial
 4 showed significant weakness in the sub-hourly market and ITAP. The ITAP vendor has
 5 since determined that significant revamping of ITAP is required and will be implementing
 6 changes throughout 2014 and 2015. Without an efficient market and scheduling platform,
 7 sub-hourly market participation and scheduling is exceptionally difficult for a region that
 8 traditionally relies on hourly bilateral scheduling. As a result, there is an increased reliance
 9 and strain on system resources to manage increased variability due to wind generation.

10 **Q. How does a sub-hourly market help to integrate wind?**

11 A. Currently, the Northwest market is an hourly market with a bi-lateral structure. An hourly
 12 market is used to integrate wind by allowing participants, such as PGE, to engage in

1 transactions that reduce the hour-to-hour variability of wind resources by procuring the
2 necessary capacity or energy for each hour. By definition, the hourly market is unavailable
3 within the hour and requires participants to use their own resources, regardless of
4 economics, to integrate the within hour variability of wind generation. A sub-hourly market
5 facilitates transactions within the hour that can be used to manage the system impact of wind
6 variability during other periods of the hour and allows participants to make the most
7 economic choice for integrating wind within the hour. During the 30/30 CIH Pilot Program,
8 PGE participated in ITAP to access the sub-hourly market, but due to the lack of liquidity in
9 the sub-hourly market and the existing hourly bi-lateral market structure of the Northwest,
10 PGE had to rely substantially on its own system to balance intra-hour load and wind
11 variations.

12 **Q. Was the sub-hourly market the only source of uncertainty PGE was facing at the time**
13 **of the April 2014 mid-rate-period election?**

14 A. No. At the time of the April 2014 mid-rate-period election, it was unclear if BPA would be
15 able to permit 15-minute scheduling on their system. In addition, the necessary BPA
16 business practices were not developed or vetted nor would they be available for comment or
17 review until after the mid-rate-period election. As discussed at the March UE 266 VERBS
18 workshop, PGE could not explicitly model the 15-minute VERBS scheduling option
19 because of the significant policy unknowns and as such represented a substantial risk.⁸ PGE
20 also faced uncertainty regarding the developing Energy Imbalance Markets (EIM) in the
21 Northwest, such as the requirements for participation, business practices, regulation, and
22 what role an EIM would play in wind integration.

⁸ Confidential Exhibit 202 provides the presentation from the March 2014 VERBS workshop. The presentation was also provided by ICNU in Confidential Exhibit ICNU/102.

1 **Q. Did PGE discuss the available election options, its analysis of those options, the results**
2 **of the analysis, the drivers identified above, and its final election with interested**
3 **Parties?**

4 A. Yes. In the stipulation reached in our last AUT filing (Docket No. UE 266), PGE agreed to
5 meet with parties at least twice to present our analyses regarding the April 2014 mid-rate-
6 period election.⁹ PGE presented both quantitative and qualitative analyses regarding the
7 topics outlined in the stipulation and discussed these major drivers in detail with other
8 Parties in that docket including ICNU, OPUC Staff, and CUB.¹⁰

9 **Q. Has PGE had sufficient time to develop the systems needed for self-integration?**

10 A. No. As we stated above, integrating wind resources is accomplished through a coordinated
11 effort using a portfolio of resources. Several necessary systems, equipment, and tools must
12 be developed, upgraded, tested, and implemented in order to ensure reliability and the
13 effective coordination of PGE's generation resources, communication and data systems,
14 power operations personnel, and Control Area personnel. Following PGE's participation in
15 BPA's 30/30 CIH Pilot Program, PGE began final development of a plan, the DDP, which
16 would coordinate and facilitate the work needed to develop, upgrade, test, and implement
17 the necessary systems, equipment, and tools. PGE began participation in BPA's 30/30 CIH
18 Pilot Program in the fourth quarter of 2011. As PGE gained experience with the 30/30 CIH
19 Pilot Program and the sub-hourly market, PGE began work on initial projects, which would
20 later be consolidated into what is now the DDP, in the first quarter of 2012. PGE anticipates
21 completing and implementing all phases of the DDP by October 1, 2015, in time for the next
22 BPA rate period.

⁹ UE 266 Stipulation Pg. 3-4

¹⁰Exhibit 203 provides the presentation from the December 2013 VERBS workshop. See Confidential Exhibit 202 for the March 2014 VERBS presentation.

1 **Q. Was the sole function of Port Westward 2 to integrate PGE’s wind resources?**

2 A. No. PGE’s 2009 Integrated Resource Plan (IRP) identified a need for capacity resources
3 including 200 MW of flexible capacity:

4 “PGE requests acknowledgement of up to 200 MW of flexible capacity resources
5 by year-end 2013 to fill a dual function of providing capacity to maintain supply
6 reliability during peak demand periods and providing needed flexibility to address
7 variable load requirements and increase levels of intermittent energy resources.”¹¹

8 PGE’s IRP was acknowledged by the Commission on November 23, 2010. As stated in the
9 excerpt above, PGE sought a resource capable of providing capacity for peak demand and
10 load following, not just the integration of variable energy resources.

11 **Q. Is Port Westward 2 able to integrate all of PGE’s wind resources?**

12 A. No, not by itself. PGE’s ability to integrate wind requires more resources than
13 Port Westward 2. As stated above, the integration of wind resources is conducted on a
14 portfolio basis and requires a coordinated effort. As we discussed with OPUC Staff, CUB,
15 ICNU, and RNP during the UE 266 BPA VERBS workshops, PGE is taking a systematic
16 and methodical approach to prepare for wind integration beginning in October 2015.

17 **Q. When is the next election opportunity for BPA VERBS?**

18 A. The next BPA VERBS election will be April 2015 for service beginning on October 1, 2015
19 and ending on September 30, 2017. At this time, BPA is in the workshop phase of
20 developing their BP-16 Rate Case and has not decided if it will offer an April 2016 mid-
21 rate-period election opportunity for service beginning on October 1, 2016 and ending on
22 September 30, 2017.

23 **Q. Is PGE preparing its systems and resources?**

¹¹ PGE’s 2009 IRP (dated November 5, 2009.), pg. 325.

1 A. Yes. PGE is currently developing and implementing the necessary systems, equipment, and
2 operational procedures for integrating wind into PGE's Control Area. PGE included an
3 estimate of the integration benefits for the fourth quarter of 2015 in our April 1 NVPC
4 update filing because October 1, 2015, is the earliest date that PGE can make a change to its
5 current BPA VERBS election. Also, by October 1, 2015, PGE will have approximately
6 eight months of operational experience with the reciprocating engine technology at
7 Port Westward 2 and anticipates completing DDP by that date.

8 **Q. Was PGE's decision to elect 30/60 committed scheduling for the April 2014 mid-rate-**
9 **period election prudent?**

10 A. Yes. PGE elected the 30/60 committed scheduling option for the BPA VERBS April 2014
11 mid-rate-period election for the following reasons:

- 12 1) The development, implementation, and testing of necessary systems, software, and
13 equipment was not complete in time for the mid-rate-period election;
- 14 2) Integration must be accomplished at the portfolio level; and,
- 15 3) There was significant uncertainty regarding available election options and developing
16 markets.

17 **Q. Is it appropriate to model NVPC for the entire 2015 test year based on self-**
18 **integration?**

19 A. No. As discussed in our previous response, 30/60 committed scheduling was the prudent
20 election for October 2014 through September 2015. PGE is continuing to pursue the least-
21 cost, least-risk option for integrating its wind resources; however, as detailed above, several
22 processes must be completed and implemented in order to ensure reliable service for
23 customers and prudently manage risk.

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

2 A. Yes.

List of Exhibits

<u>PGE Exhibit</u>	<u>Description</u>
201	Dynamic Dispatch Program Timeline
202C	March 2014 VERBS Workshop Presentation
203	December 2013 VERBS Workshop Presentation

Timeline of the Development of PGE's Dynamic Dispatch Program (DDP)*

*End dates for future completion are estimates

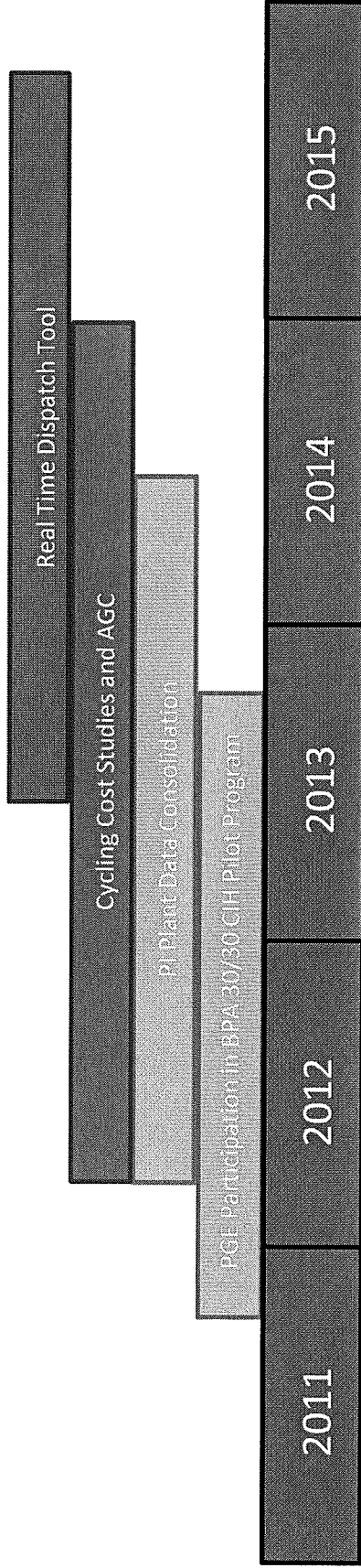
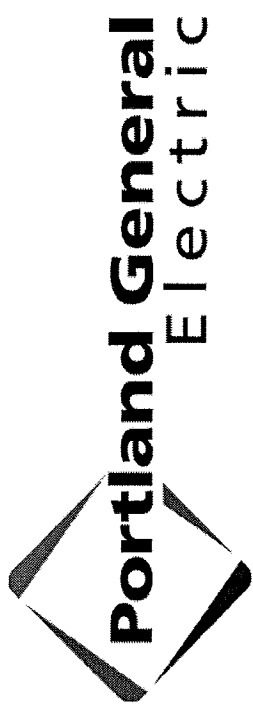


Exhibit 202

Confidential and Subject to Protective Order No. 14-043

UE 286 / PGE / 203
Niman - Peschka - Hager / 1

BPA VERBS Election Workshop Dec 17, 2013



Introduction

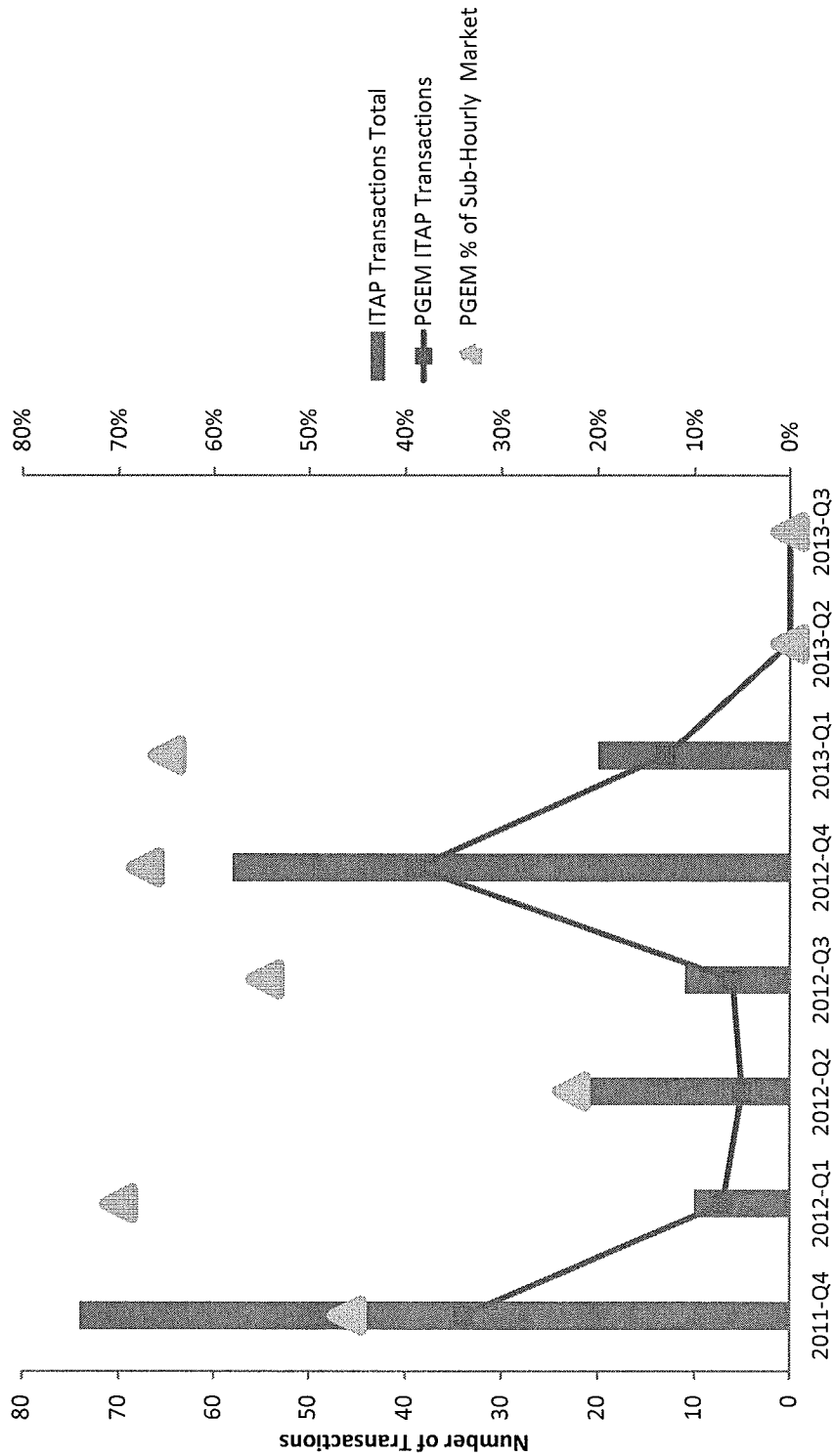
UE 286 / PGE / 203
Niman - Peschka - Hager/2

- Pursuant to a stipulation in UE 266 – PGE Net Variable Power Cost (NVPC and Annual Update Tariff (AUT)) PGE agreed to present to interested parties the following information:
 - Assumptions underlying the cost benefit analysis for the April 2014 mid-rate-period election
 - Rough Magnitude of System value of BPA discounted rates
 - Rough magnitude of additional costs and risks, incremental to shorter scheduling or self-supply
 - Assessment of whether any additional costs or risks expected for the rate period could be justified in light of longer term costs savings and other system benefits
- It remains PGE's Long-term strategy to reliably integrate current and future VERs with a hybrid approach (combination of various integration mechanisms)

Overview

- Review Assumptions for mid-rate-period election
 - Sub-hourly market assumptions
 - Capacity needs assumptions
 - EIM Activities assumptions
- Provide updates on system upgrades
 - Dynamic dispatch tool
 - Cycling cost studies
 - AGC upgrades
- Additional Costs / Risks for mid-rate-period elections
 - Plant Cycling Cost Study
 - Operation of facilities outside of market pricing for reliability
 - Potential cost risks

Sub-Hourly Market History



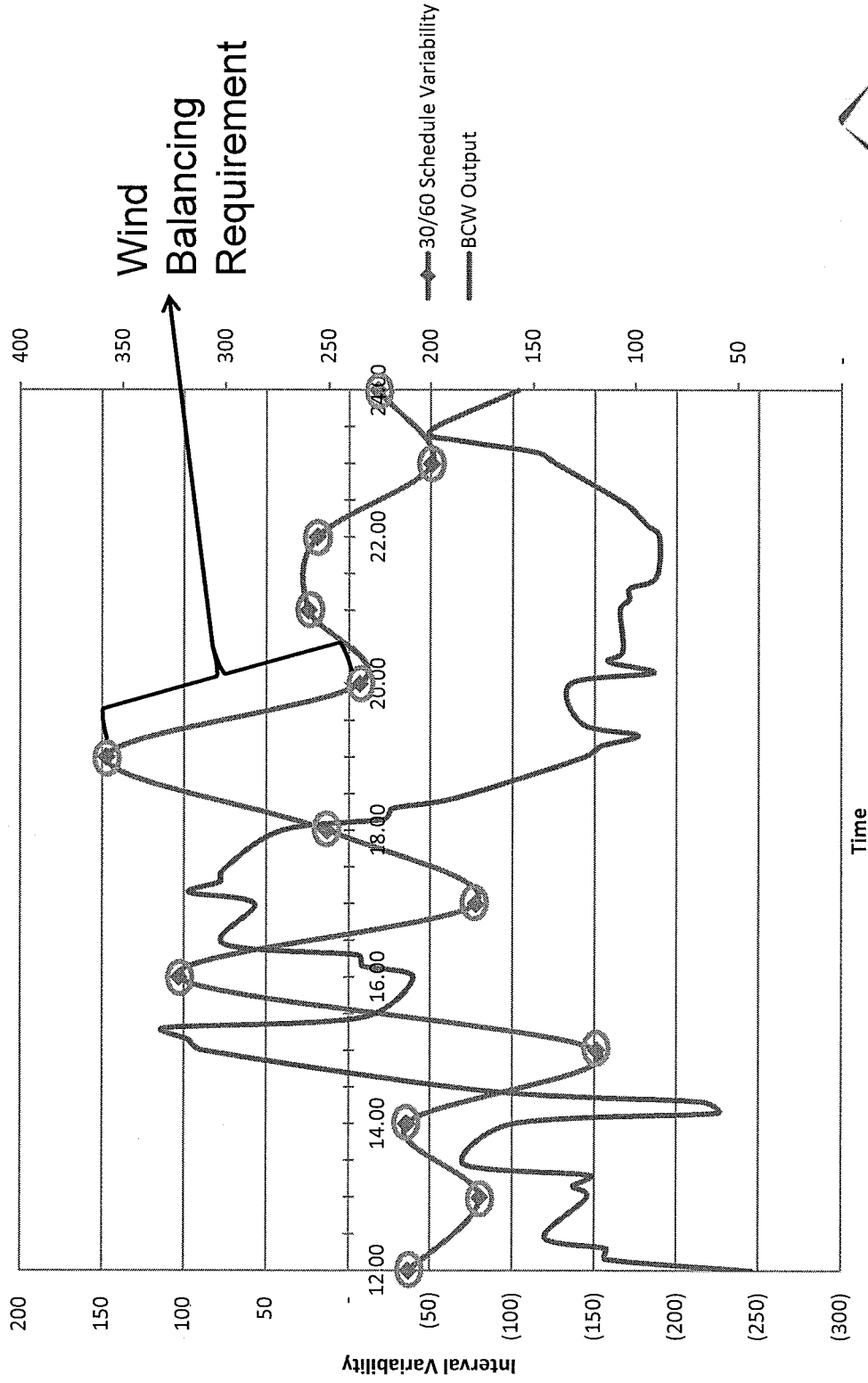
Sub-Hourly Market Assumptions

- Availability and requirements surrounding sub-hourly (15-minute) scheduling
 - BPA has no 15-minutes business practice to date
 - BPA's system software and testing will be incomplete by election deadline
 - Impacts of BPA's "Pre-emption and Competition" and "Managing Hourly Firm Sales" are unclear at this time
- BPA limitations on sub-hourly transmission
 - Non-Firm transmission hourly blocks for sub-hourly schedules
 - Availability of sub-hourly scheduling business practice or other proposals
- Trading platform status
 - Electronic trading platform is critical for sub-hourly market success
 - ITAP updates and cost unclear at this time
 - ITAP usage statistics and abilities remain limited
- Conclusion
 - Participants are unlikely to commit large quantities of capacity or energy to an undeveloped market in the 2014-2015 mid-rate-election period

Capacity Needs Assumptions

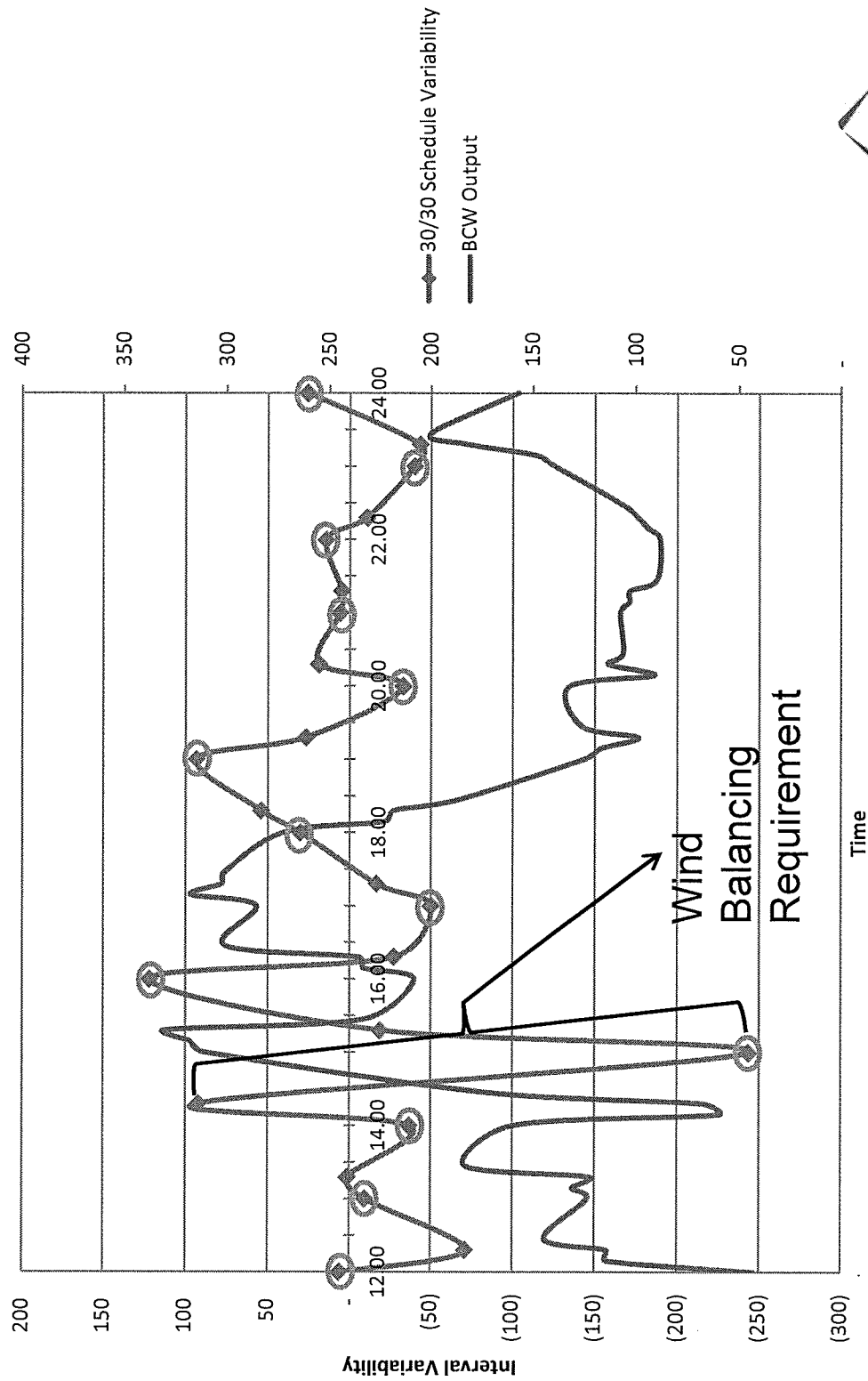
UE 286 / PGE / 203
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30/60 Wind Variability (October 1, 2013)



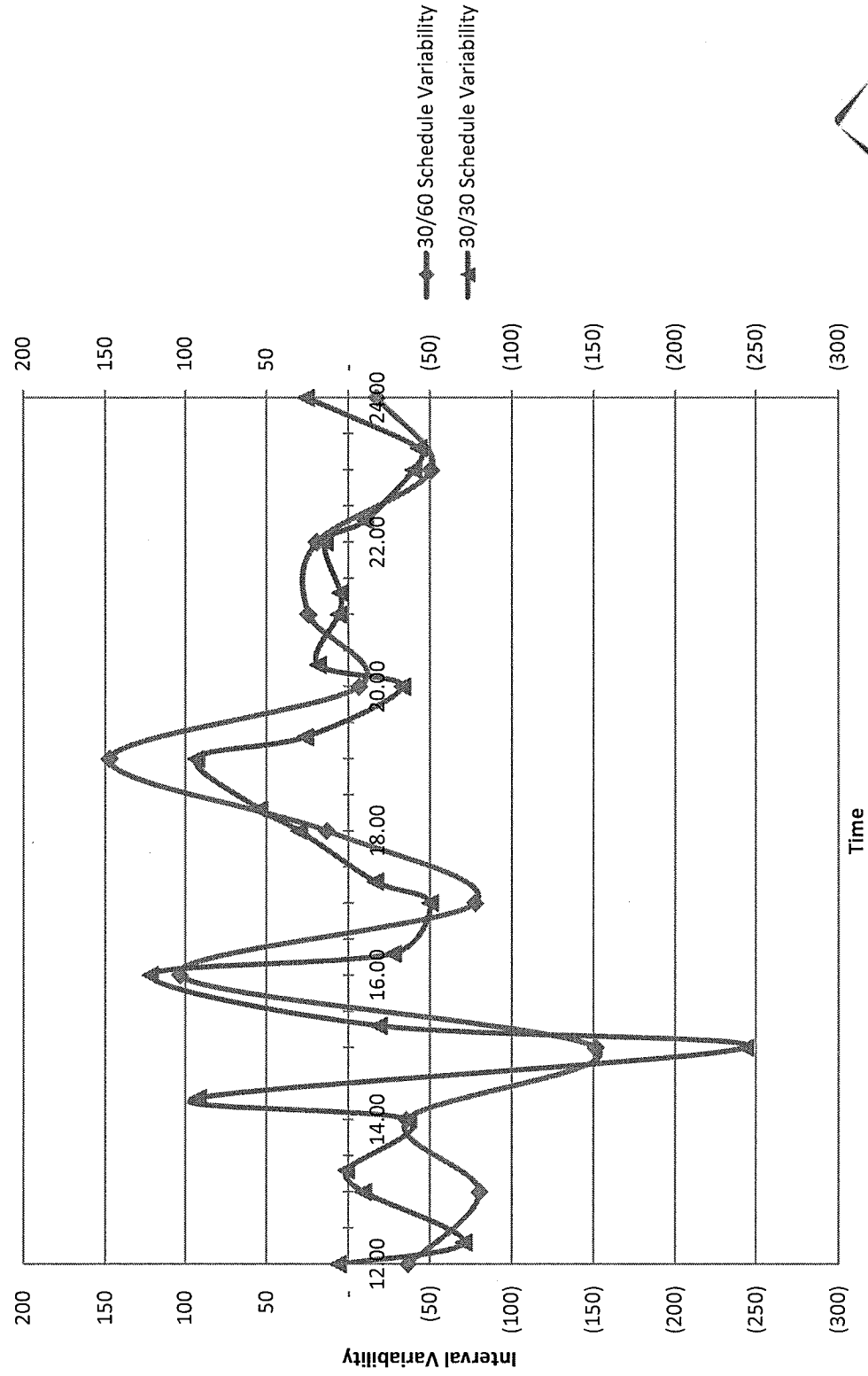
Capacity Needs Assumptions

30/30 Wind Variability (October 1, 2013)



Capacity Needs Assumptions

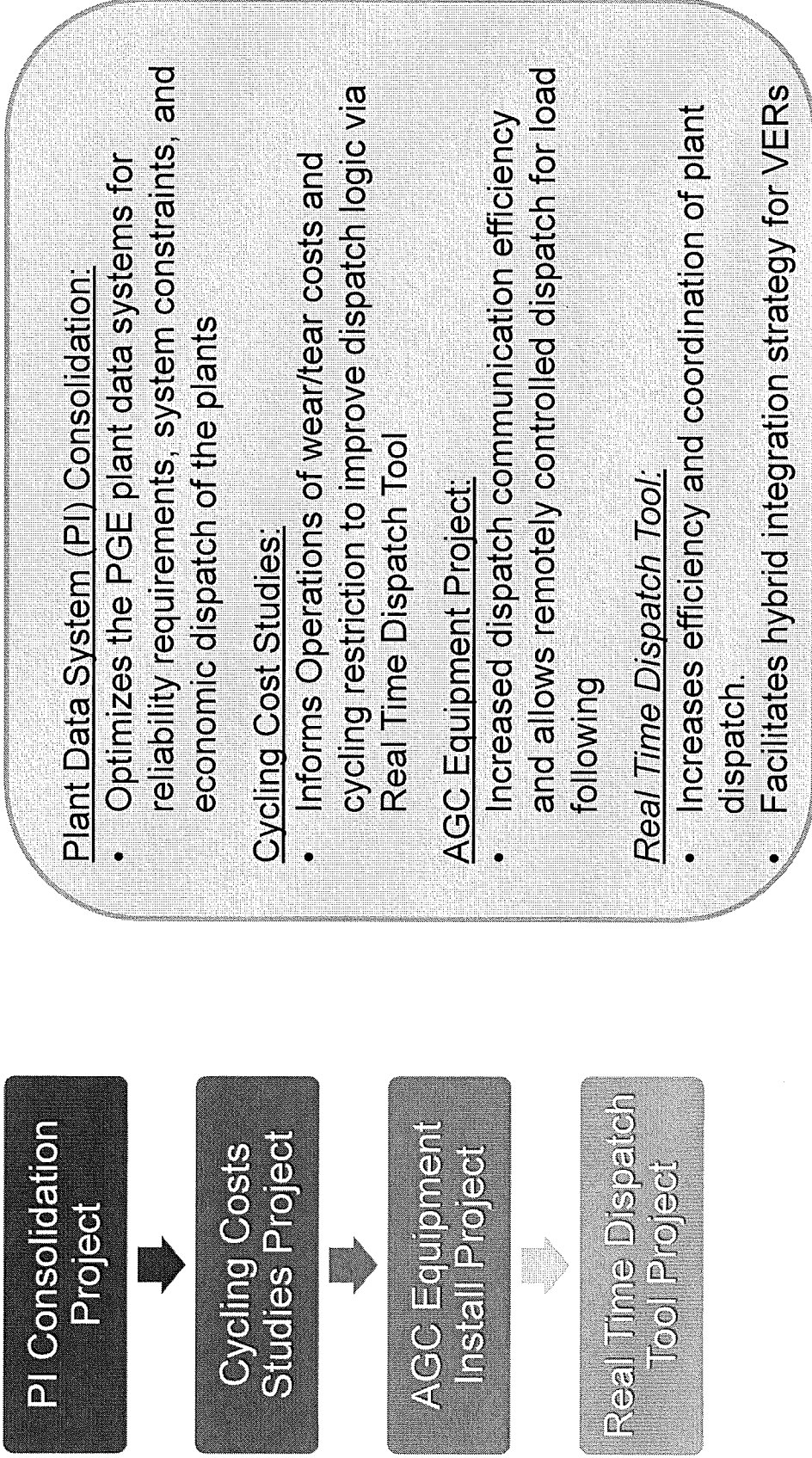
30/60 v. 30/30 Wind Variability (October 1, 2013)



System Improvements Overview

- Status of system improvements that will be available to improve PGE's within-hour flexibility
 - PW 2 and Tucannon River Wind are under construction
 - Expected PW2 operational date: Q1 2015
 - Dynamic Dispatch Tool
 - Plant Data System (PI) Consolidation Project
 - Cycling Cost Studies
 - AGC Equip Generating Resources
 - Real Time Dispatch Tool Project
 - EIM Update

Projects Within the Dynamic Dispatch Program



EIM Market Update

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- Objectives of Northwest Power Pool - Members Market Assessment and Coordination Committee (NWPP-MC)
 - Manage Variable Energy Resource Operational Impacts
 - Share Regional Balancing Diversity and Capabilities
 - Enhance Reliability of Transmission Constraint Management
- Status of NWPP-MC
 - Phase 2 (Complete) Review of tools and cost / benefits estimates
 - Phase 3 Seeking funding commitment from the region
 - Updates in Early 2014
 - Develop Enhanced Operational tools and Increased Regional Coordination
- Status of PAC/CAISO EIM effort
 - PGE is actively participating in the CAISO-PAC stakeholder process

Additional Costs to Shorter Scheduling

- Plant cycling cost study
 - 1st set of results Q1 2014
 - 2nd set of results later 2014
- Operation of facilities for reliability
 - Reserving facilities for reliability purposes
 - Uneconomic operation for reserve capacity
- Potential risk
 - Limiting maximum VERs generation
 - BPA purchase charges for direct assignment
 - Reliability risks for meeting load net wind

Benefits of Delaying Shorter Interval Scheduling

- Focus on system investments
 - Dynamic Dispatch Program implementation and launch
 - Preparation for EIM markets
- Locational diversity of Biglow Canyon and Tucannon River
 - Operating experience needed to justify modeled expectations
- More AGC capable units available
 - More AGC capable units allow smaller single plant movement
 - Improvements in thermal stress and reduced wear and tear

2014-2016 Region Project Timeline

	2014	2015	2016
NWPP MC Phase 3	Regional Infrastructure Upgrades		
NWPP MC Phase 4	Resource Sufficiency Standard		
NWPP MC Phase 5	SCED RFP	SCED/EIM Program Implementation	
PAC/CAISO EIM	◆ New Entity Opt In*	◆ New Entity Go Live*	
	◆ PacifiCorp Go Live		
BPA Initiatives*	30-min Intra-hour	STAR AFC Project	
	◆ 15-min Intra-hour*		
RC Initiatives*	Short-Term Comp	Limit Hourly Sales	Future Rate Cases
	◆ Next Day Planning other flow-based tools	◆ ECC Go Live	

◆ = Internal Decision Points / Off-Ramps

* Estimated Date Ranges

◆ = External Milestones

◆ = Mid-rate-election for 2015



Review

- ✓ Review Assumptions for mid-rate-period election
 - ✓ Sub-hourly market assumptions
 - ✓ EIM Activities
 - ✓ Capacity needs assumptions
- ✓ Additional Costs / Risks for mid-rate-period elections
- ✓ Provide updates on system upgrades
 - ✓ Dynamic dispatch tool
 - ✓ Cycling cost studies
 - ✓ AGC upgrades

Questions

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Questions??



CERTIFICATE OF SERVICE

I hereby certify that I have this day caused **UE 286 PORTLAND GENERAL ELECTRIC REBUTTAL TESTIMONY**, by electronic mail to those parties whose email addresses appear on the attached service list for OPUC Docket No. UE 286.

DATED at Portland, Oregon, this 16th day of June 2014.



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