



Oregon

Kate Brown, Governor

Public Utility Commission

201 High St SE Suite 100

Salem, OR 97301

Mailing Address: PO Box 1088

Salem, OR 97308-1088

Consumer Services

1-800-522-2404

Local: 503-378-6600

Administrative Services

503-373-7394

August 12, 2016

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OREGON PUBLIC UTILITY COMMISSION
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**RE: Docket No. UE 308 – 2017 Annual Power Cost Update Tariff
(Long Term Hedging)**

Enclosed for electronic filing are the following:
Exhibit 400-401 and Exhibit 500-503.
Exhibit 500 has confidential pages from page 4-14
Exhibit 501 and 502 are confidential

A Certificate of Service and Service list are included with this filing

/s/ Kay Barnes
Kay Barnes
PUC- Utility Program
(503) 378-5763
kay.barnes@state.or.us

CERTIFICATE OF SERVICE

UE 308

I certify that I have, this day, served the foregoing document upon all parties of record in this proceeding by delivering a copy in person or by mailing a copy properly addressed with first class postage prepaid, or by electronic mail pursuant to OAR 860-001-0180, to the following parties or attorneys of parties.

Dated this 12th day of August, 2016 at Salem, Oregon



Kay Barnes
Public Utility Commission
201 High Street SE Suite 100
Salem, Oregon 97301-3612
Telephone: (503) 378-5763

UE 308-SERVICE LIST

CITIZENS UTILITY BOARD OF OREGON	
CITIZENS' UTILITY BOARD OF OREGON	610 SW BROADWAY, STE 400 PORTLAND OR 97205 dockets@oregoncub.org
MICHAEL GOETZ (C) CITIZENS' UTILITY BOARD OF OREGON	610 SW BROADWAY STE 400 PORTLAND OR 97205 mike@oregoncub.org
ROBERT JENKS (C) CITIZENS' UTILITY BOARD OF OREGON	610 SW BROADWAY, STE 400 PORTLAND OR 97205 bob@oregoncub.org
INDUSTRIAL CUSTOMERS OF NORTHWEST UTILITIES	
BRADLEY MULLINS (C) MOUNTAIN WEST ANALYTICS	333 SW TAYLOR STE 400 PORTLAND OR 97204 brmullins@mwanalytics.com
TYLER C PEPPE (C) DAVISON VAN CLEVE, PC	333 SW TAYLOR SUITE 400 PORTLAND OR 97204 tcp@dvclaw.com
S BRADLEY VAN CLEVE (C) DAVISON VAN CLEVE PC	333 SW TAYLOR - STE 400 PORTLAND OR 97204 bvc@dvclaw.com
NOBLE AMERICAS ENERGY SOLUTIONS	
GREGORY M. ADAMS (C) RICHARDSON ADAMS, PLLC	PO BOX 7218 BOISE ID 83702 greg@richardsonadams.com
GREG BASS NOBLE AMERICAS ENERGY SOLUTIONS, LLC	401 WEST A ST., STE. 500 SAN DIEGO CA 92101 gbass@noblesolutions.com
KEVIN HIGGINS ENERGY STRATEGIES LLC	215 STATE ST - STE 200 SALT LAKE CITY UT 84111-2322 khiggins@energystrat.com
UE 308 PGE	
DOUGLAS C TINGEY (C) PORTLAND GENERAL ELECTRIC	121 SW SALMON 1WTC1301 PORTLAND OR 97204 doug.tingey@pgn.com
JAY TINKER (C) PORTLAND GENERAL ELECTRIC	121 SW SALMON ST 1WTC-0306 PORTLAND OR 97204 pge.opuc.filings@pgn.com
UE 308 STAFF	
STEPHANIE S ANDRUS (C) PUC STAFF--DEPARTMENT OF JUSTICE	BUSINESS ACTIVITIES SECTION 1162 COURT ST NE SALEM OR 97301-4096 stephanie.andrus@state.or.us
JOHN CRIDER (C) PUBLIC UTILITY COMMISSION OF OREGON	PO BOX 1088 SALEM OR 97308-1088 john.crider@state.or.us

CASE: UE 308
WITNESS: BEN FITCH-FLEISCHMANN

**PUBLIC UTILITY COMMISSION
OF
OREGON**

STAFF EXHIBIT 400

**Opening Testimony
(Long-Term Hedging)**

August 12, 2016

1 **Q. Please state your name, occupation, and business address.**

2 A. My name is Ben Fitch-Fleischmann and I am a Senior Economist for the Public
3 Utility Commission of Oregon. My business address is 201 High Street SE,
4 Suite 100, Salem, Oregon 97301.

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

6 A. My witness qualification statement is contained in Exhibit Staff/401.

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

8 A. PGE is contemplating the initiation of a long-term natural gas hedging program
9 and has proposed (1) a set of guidelines to govern such a program and (2) a
10 specific long-term contractual arrangement that would provide PGE with direct
11 ownership of natural gas reserves and their associated production assets, and
12 contribute to PGE's rate base. PGE has requested that the Commission
13 approve its proposed guidelines for long-term gas hedging and agree that
14 actions that satisfy these guidelines receive a presumption of prudence.¹

15 This testimony provides Staff's assessment of long-term gas
16 hedging in general and examines PGE's proposed hedging guidelines. The
17 details of the specific long-term "hedge" contract proposed by PGE are
18 addressed separately in Staff witness Lance Kaufman's testimony.

19 **Q. Did you prepare an exhibit for this docket?**

20 A. No.

21 **Q. How is your testimony organized?**

22 A. As follows:

¹ See PGE/100, Tinker-Sims/21 and PGE/200, Sims-Outama/2.

1	Summary of Key Issues	2
2	Issue 1. Why Hedge Natural Gas?.....	4
3	Issue 2. Staff Questions the Prudence of Utility Ownership of Gas	
4	Reserves as a Hedge.....	7
5	Issue 3. Staff Recommends that the Commission Not Approve PGE's	
6	Proposed Guidelines for Long-Term Gas Hedging.....	9
7		

Summary of Key Issues

8 **Q. What are the fundamental issues under consideration?**

9 A. The fundamental issues are framed by the following two questions:

10 (1) Should utilities engage in “long-term” hedging of natural gas?

11 (2) Is it in the public interest for a regulated utility to hedge by investing in
12 natural gas reserves and the associated exploration and production assets?

13 **Q. Please briefly state Staff’s position on these questions.**

14 A. Staff believes that long-term hedges deserve greater scrutiny than short-term
15 hedges because they make longer commitments on behalf of customers, and
16 also because they are more likely to affect the transmission of economically
17 important price signals. Staff questions whether it would be in the public
18 interest for a regulated utility to hedge by engaging in the exploration and
19 production of natural gas.

20 **Q. How is long-term hedging of natural gas related to the public interest?**

21 A. Hedging refers to any method of reducing risk. In this context, the volatility in
22 natural gas prices exposes customers to the risk of paying high rates for
23 natural gas, and utilities attempt to manage this risk. However, it must be noted
24 that there is an inherent trade-off between reducing price volatility and

1 conveying price signals. By insulating customers from market price volatility,
2 natural gas hedging alters the information that customers receive (via price
3 signals) regarding the social value of natural gas in different areas and during
4 different time periods. The economic significance of this trade-off increases
5 with the length of time over which the price volatility is reduced. This is
6 because transient factors (e.g., weather) may drive short-term changes in the
7 price of natural gas, but structural factors (e.g., new technological
8 developments) drive prices over the long term.² Thus, long-term hedging
9 should strike an appropriate balance between (1) reducing certain market price
10 volatility for customers and (2) not interfering with the timely transmission of
11 accurate price signals reflective of structural economic changes.

12 **Q. Could a utility's ownership of natural gas reserves be an appropriate**
13 **hedge strategy?**

14 A. The ownership of natural gas reserves carries risks that are outside the typical
15 experience and expertise of electric utilities. Staff questions whether it would
16 be prudent to manage gas price risk through an arrangement that exposes an
17 electric utility's customers to new and unfamiliar forms of risk, such as the
18 production risk associated with gas reserve ownership, especially if such an
19 arrangement requires a long-term commitment or if more familiar risk
20 management methods are possible.

² Staff appreciates PGE's acknowledgement of the association between "structural shifts due to fundamental changes in supply and demand" and longer-term price volatility. See PGE/100, Tinker-Sims/10.

1 **Issue 1. Why Hedge Natural Gas?**

2 **Q. What does it mean to “hedge” natural gas?**

3 A. Technically, a “hedge” is any action taken to limit a particular risk. In the
4 context of this docket, utilities and their customers face volatile prices for
5 natural gas and they may wish to limit the risk that a utility will need to buy gas
6 during a period of high prices. To limit this risk, utilities may hedge by securing
7 in advance a fixed price for the delivery of gas in the future. It is essential to
8 understand that hedging rarely, if ever, reduces one type of risk without also
9 introducing new types of risk in exchange. Hedging is a strategy for risk
10 *management*, not risk reduction.

11 **Q. What methods are typically used to hedge natural gas?**

12 A. Typical hedging methods include futures contracts for gas and financial
13 instruments tied to gas prices (e.g., swaps or options). Less common methods
14 include the acquisition of storage capacity and “vertical” arrangements in which
15 a utility has direct ownership of natural gas reserves and their associated
16 exploration and production assets, activities, and risks.³

17 **Q. What are the costs of hedging?**

18 A. In addition to the fees charged by parties involved in hedge transactions and
19 the costs of utility resources used to manage hedging programs, hedging
20 raises the possibility of costs created from any new risks introduced by a
21 hedge. The most frequently realized such risk is the risk of a “hedge loss,”

³ “Vertical Arrangements for Natural Gas Procurement by Utilities: Rationales and Regulatory Considerations” by Ken Costello in National Regulatory Research Institute Report No. 16-04, February 2016. Pages 1 to 4. Available at <http://nrri.org/download/vertical-arrangements-for-natural-gas-procurement-by-utilities-rationales-and-regulatory-considerations/>

1 which occurs if the contracted price exceeds the spot market price at the time
2 of delivery, thus causing customers to pay more than they would have paid in
3 the absence of the hedge. Another potential risk is that the counterparty to a
4 hedge may not be able to uphold their commitment (i.e., counterparty
5 performance and credit risk). Utilities are typically aware of these risks and
6 experienced in assessing them and contracting to mitigate them.

7 **Q. Should regulators expect that a utility's hedging activities will decrease**
8 **rates?**

9 A. No. This is because futures market prices “reflect all participants’ money-
10 backed consensus as to the future price of natural gas.”⁴ In other words, to
11 enter into a “hedge” on the belief that one will “beat the market” is purely
12 speculative and akin to holding the view that “while all market participants have
13 equal access to data regarding consumption, production, storage, and other
14 factors, and they have reached a consensus on next year’s futures price, I
15 know better.”⁵ Accordingly, hedging strategies should be predicated on the
16 expectation that fifty percent of hedges will result in hedge losses. Staff
17 appreciates PGE’s reiterations that the purpose of a hedge is not to “beat the
18 market” and thereby reduce rates.⁶ Given these reiterations, however, Staff is
19 puzzled by PGE’s first proposed guideline, which states that the cost of an
20 acceptable long-term hedge must be “at or below the current long-term market

⁴ “Natural Gas Utility Hedging Practices and Regulatory Oversight” by Michael Gettings of RiskCentrix, July, 2015, page 9. Available at http://riskcentrix.com/uploads/3/6/7/5/3675199/natural_gas_utility_hedging_practices_and_regulatory_oversight_published Ug-132019.pdf

⁵ Ibid.

⁶ PGE/100, Tinker-Sims/17 and PGE/100, Tinker-Sims/21.

1 price forecast.”⁷ In other words, PGE’s first proposed guideline is that a hedge
2 should be expected to beat the market. Staff is not opposed to the
3 opportunistic procurement of gas at below-market prices, but such
4 procurement is not the purpose of hedging.

5 **Q. What are the benefits of hedging natural gas?**

6 A. Gas hedging has the potential to reduce volatility in customer rates, thus
7 increasing rate stability and predictability. Of course, other factors also
8 contribute to rate volatility. In Oregon, unlike some states, rates typically
9 change no more than once per year due to the timing of rate cases, power cost
10 updates, and purchased gas adjustments. In other words, the intra-year rate
11 volatility under the current system in Oregon is practically zero.

12 PGE states that gas hedging “is important because customers have
13 indicated that they prefer price stability.”⁸ However, long-term hedging is not a
14 costless activity, and Staff agrees with the National Regulatory Research
15 Institute that the justification of long-term hedging ought to require the utility to
16 “provide evidence, other than conjecture, that customers are willing to pay
17 something for more stable prices over the long term” [emphasis added].⁹

18

⁷ PGE/100, Tinker-Sims/10.

⁸ PGE/100, Tinker-Sims/4.

⁹ NRRI Report No. 16-04, page v.

1 **Issue 2. Staff Questions the Prudence of Utility Ownership of Gas**

2 **Reserves as a Hedge**

3 **Q. Does utility ownership of gas reserves provide benefits to utilities or their**
4 **customers?**

5 A. In their evaluation of this issue, the National Regulatory Research Institute
6 (NRRI) finds that the benefits of reserve ownership to the utility and its affiliates
7 are much more definitive than any (potential) benefits to the utility's customers.
8 While the utility can rate-base the gas-reserves assets, and their affiliates get a
9 reliable cash flow and the chance of higher profits from selling to the utility
10 rather than on the open market, NRRI finds that "no good reason exists to
11 believe that the long-term hedging benefits to customers warrant the
12 substantial efforts that utilities have made to consummate joint agreements" for
13 reserve ownership.¹⁰ NRRI also points out that these arrangements create the
14 possibility of self-dealing between the utility and its affiliate, thus increasing the
15 need for vigilance and oversight by regulators. Staff is persuaded by NRRI's
16 assessment that because "utilities are betting that future natural gas prices will
17 increase based on highly imperfect information, and then structur[ing] a long
18 term plan designed to achieve gas-cost savings," the "vertical arrangements
19 proposed by utilities resemble more of a speculative than hedging activity."¹¹

20
21

¹⁰ NRRI Report No. 16-04, page 41.

¹¹ Ibid, page vii.

1 **Q. Does utility ownership of gas reserves create risks for the utility and its**
2 **customers?**

3 A. Yes, and many of these were investigated in docket UM 1520 (Northwest
4 Natural's Encana deal). NRRI categorizes the major risks as relating to: "(1)
5 gas-production operating cost, (2) level of gas reserves and production (dry
6 holes), (3) liability and incomplete contractual agreement leaving room for
7 opportunism..., [and] (4) counterparty risk."¹² Staff agrees with NRRI that utility
8 ownership of reserves is "a high-risk strategy" that creates risks for customers
9 that are outside the range of expertise typical of an electric utility.¹³ Staff also
10 agrees with CUB that this docket is not the appropriate place, nor does it
11 provide sufficient time, to evaluate the substantial new risks that would be
12 created by PGE's proposed ownership of natural gas reserves.¹⁴

13 **Q. Are there conditions under which it would make sense for a utility to**
14 **participate in the production of fuel, such as gas or coal?**

15 A. Yes. NRRI provides a clear description of these conditions:

16 Transaction cost economics (TCE) predicts the market conditions
17 under which vertical integration is a preferred institutional
18 arrangement over long-term contracting and spot market
19 transactions. When asset specificity, sunk costs, and a high
20 degree of complexity (e.g., the buyer requires a product to have
21 exact specifications of a high technical nature) characterize a
22 trade, vertical integration can be the most efficient alternative. As
23 the contractual process becomes highly complex, for example, a
24 firm might rationally decide to supply a required input internally
25 rather than purchasing it in the marketplace to avoid the high
26 transaction costs associated with contracting.¹⁵

¹² NRRI Report No. 16-04, page vi.

¹³ Ibid.

¹⁴ See CUB/100, Jenks-Hanhan/4-10.

¹⁵ Page iv, NRRI Report No. 16-04.

1 **Q. Are these conditions present for natural gas?**

2 A. No. Both spot and futures markets for natural gas have high liquidity and the
3 cost of using the marketplace is low. Furthermore, the specifications required
4 of natural gas are not of a highly technical and exact nature, as can be the
5 case with other commodities. For example, coal from different parts of the
6 country varies significantly in its mineral composition and heat content,
7 whereas natural gas is regulated to be of a consistent composition and quality.

8

9

10 **Issue 3. Staff Recommends that the Commission Not Approve PGE's**

11 **Proposed Guidelines for Long-Term Gas Hedging**

12 **Q. What guidelines does PGE suggest as sufficient conditions for**
13 **establishing prudence?**

14 A. PGE proposes four guidelines:

- 15 1. The projected levelized cost of gas acquired in a hedge must be at or below
16 the levelized forecast cost of gas used in PGE's IRP.¹⁶
17
18 2. Long-term gas purchase commitments must not exceed an established limit.
19 (PGE proposes that an "appropriate range" for this limit would fall within "15 to
20 30 percent of projected annual average gas burn."¹⁷)
21
22 3. Purchases of gas reserves must be only for reserves that are "proved or
23 probable."
24
25 4. The unit cost of gas from purchases of gas reserves is included in power
26 cost updates only up to a 10 percent deviation from forecast costs and
27 volumes.
28

¹⁶ PGE refers to these respectively as the "long-term projected cost" and "long-term benchmark price."

¹⁷ See PGE/200, Sims-Outama/5.

1 Staff notes that Guidelines 3 and 4 apply exclusively to the ownership of
2 natural gas reserves, and Guideline 4 applies only to the rate-making
3 associated with such ownership and therefore does not actually place any
4 restrictions on, nor offer any guidance for, hedging activities.

5 **Q. Why does Staff oppose the Commission's approval of PGE's proposed**
6 **guidelines?**

7 A. Hedging is a method for managing risk, and risk changes with market
8 conditions. Therefore, hedging activities should be responsive to market
9 conditions and hedging guidelines should reflect this. PGE's proposed
10 guidelines do not do this. Instead, they appear tailored specifically to facilitate
11 the acquisition of gas reserves at this time, rather than an attempt to outline a
12 comprehensive approach to hedging.

13 As detailed under Issue 2, Staff questions the prudence of hedging
14 by investing in natural gas reserves because this would "manage" risk by
15 exposing customers to risks that are unfamiliar to an electric utility and outside
16 its typical expertise. If PGE believes that it is different than other market
17 participants in such a way that it is in a position to procure gas at below market
18 prices through reserve ownership at this time, as PGE seems to imply by
19 referring to itself as a "high-quality, strategic (end-user) purchaser" of natural
20 gas, then Staff believes PGE should explicitly acknowledge this and explain
21 why it believes it is in such a position, relative to other gas purchasers at this
22 time.¹⁸ Because such a justification explicitly hinges on an expectation of

¹⁸ See PGE/100, Tinker-Sims/12.

1 procuring gas at prices lower than those available on the market, this case
2 should not be made in the context of PGE's hedging program.

3 Staff also objects in principle to PGE's proposal to establish
4 guidelines specifically for *long-term* hedging, rather than gas hedging in
5 general. There is neither an obvious nor a theoretically justified distinction
6 between the "short" and "long" term in this context.¹⁹ Thus, the scope of activity
7 covered by "long-term" guidelines is poorly defined and appears arbitrary at
8 this point. Staff also notes that the value of a portfolio that is at risk to price
9 increases is a function of all positions in the portfolio, regardless of their terms,
10 so it is important that short- and long-term hedging strategies, if differentiated,
11 are responsive to each other rather than governed independently.

12 The two guidelines that PGE proposes that do not apply exclusively
13 to reserve ownership (Guidelines 1 and 2) amount only to a restriction that
14 long-term hedges must be expected to produce gas at prices below market
15 forecasts (which PGE explicitly states is not the purpose of hedging) along with
16 a fixed cap on the volume of gas to hedge. Staff finds this to be insufficient. In
17 particular, simply prescribing a fixed percentage of a portfolio to be hedged
18 creates a "lock-and-leave" approach which is at odds with more commonly
19 used hedging strategies, such as the value-at-risk (VaR) approach to hedging,
20 which is used by some utilities and many other companies.²⁰

¹⁹ This issue has affected Docket No. UM 1720, whose scope has expanded from an investigation of Northwest Natural's long-term hedging policy into gas hedging policy more generally.

²⁰ The VaR approach is described in detail with regards to natural gas hedging in "Natural Gas Utility Hedging Practices and Regulatory Oversight" by Michael Gettings of RiskCentrix, July, 2015. The "lock-and-leave" approach is not uncommon among regulated utilities, but it has recently been the

1 A comprehensive set of hedging guidelines would prescribe the
2 hedging activities to be pursued under various market conditions. While PGE's
3 proposal of a particular hedge may in fact be a demonstration of PGE's
4 responsiveness to current market conditions, PGE's proposed guidelines are
5 silent with regards to how hedging activities should respond to market
6 conditions. Yet, the Commission's approval of the guidelines as proposed
7 would create a presumption of prudence for a poorly defined range of activities
8 and do so with no regard for the market conditions under which such activities
9 were undertaken. For these reasons, Staff recommends against the
10 Commission's approval these guidelines.

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

12 A. Yes.

subject of increased skepticism, and its use can plausibly be attributed to the fact that utilities simply pass gas costs through to rate payers.

CASE: UE 308
WITNESS: BEN FITCH-FLEISCHMANN

**PUBLIC UTILITY COMMISSION
OF
OREGON**

STAFF EXHIBIT 401

Witness Qualifications Statement

August 12, 2016

WITNESS QUALIFICATIONS STATEMENT

NAME: Benjamin Fitch-Fleischmann

EMPLOYER: Public Utility Commission of Oregon

TITLE: Senior Economist
Energy Resources and Planning Division

ADDRESS: 201 High Street SE. Suite 100
Salem, OR. 97301

EDUCATION: B.A., Economics and Government, Claremont McKenna College
M.A., Economics, University of Montana
M.S., Economics, University of Oregon
Ph.D., Economics, University of Oregon

EXPERIENCE: I have been employed at the Oregon Public Utility Commission since May of 2016. My current responsibilities include analyses of natural gas hedging practices, renewable portfolio implementation plans, integrated resource plans, and competitive bidding processes.

Prior to working for the OPUC, I was a professor of economics and environmental studies at Oberlin College. Before that, I was an economics instructor at the University of Oregon. I have taught undergraduate courses on microeconomics, macroeconomics, econometrics, environmental economics, and behavioral economics.

From 2006 to 2008, I was an analyst for ICF International and consulted on projects for the US Department of Energy, the US Environmental Protection Agency, and other governmental entities.

CASE: UE 308
WITNESS: LANCE KAUFMAN

**PUBLIC UTILITY COMMISSION
OF
OREGON**

STAFF EXHIBIT 500

**Opening Testimony
(Long-Term Hedging)**

**REDACTED
August 12, 2016**

1 **Q. Please state your name, occupation, and business address.**

2 A. My name is Lance Kaufman. I am a Senior Economist employed in the Energy
3 Rates, Finance and Audit Divison of the Public Utility Commission of Oregon
4 (OPUC). My business address is 201 High Street SE., Suite 100, Salem,
5 Oregon 97301.

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

7 A. My witness qualification statement is found in Exhibit Staff/301.

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

9 A. The purpose of my testimony is to evaluate PGE's proposed gas production
10 investment.

11 **Q. Did you prepare an exhibit for this docket?**

12 A. Yes. I prepared a summary of PGE's revenue requirement forecast in Exhibit
13 Staff/501, consisting of 3 pages. I prepared a summary of Staff's revenue
14 requirement forecast in Exhibit Staff/502, consisting of 3 pages. I provide a
15 copy of PGE's response to Staff Data Requests in Exhibit Staff/503, consisting
16 of 4 pages.

17 **Q. How is your testimony organized?**

18 A. My testimony is organized as follows:

19	Issue 1. Proposed Investment is not Cost Effective	4
20	Issue 2. The Value of the Proposed Investment is Uncertain	9
21	Issue 3. Proposal Adds to PGE's Cost of Capital.....	11
22	Issue 4. Timing of Costs and Benefits are not Matched	19

23 **Q. Please summarize PGE's proposed gas production investment.**

1 A. PGE plans to enter into a natural gas production partnership (“Proposed
2 Investment”) with an existing natural gas producer (“Production Partner”).
3 Through a newly formed affiliate Portland General Gas Supply Company
4 (PGGS), PGE would invest in drilling and developing new gas wells. PGE is
5 proposing to incorporate costs of the Proposed Investment into the 2017
6 Annual Power Cost Update (APCU), which would increase 2017 power costs
7 by \$0.6 million.¹ PGE also requests that the Commission:

- 8 • Approve affiliated interest transactions for the Proposed Investment.
- 9 • Waive the lower of cost or market rules for the Proposed Investment.
- 10 • Approve hedging guidelines that would facilitate PGE’s formulaic
11 investment of approximately \$325 million into well acquisition and
12 development.
- 13 • Allow formulaic recovery of the \$325 million investment through the
14 AUT.

15 **Q. What concerns does Staff have regarding this investment?**

16 A. Staff’s review of the Proposed Investment identified a number of issues:

- 17 • PGE overstates the cost effectiveness of the investment;
- 18 • PGE understates the risk of the investment;
- 19 • The investment may add to PGE’s cost of capital; and
- 20 • The timing of the costs and benefits do not match.²

21 **Q. Please summarize your findings and recommendation.**

¹ See PGE/700, Sims – Tooman/2, line 11.

² See PGE/100, Tinker – Sims/21, lines 15-22.

1 A. I find that the Proposed Investment increases PGE's long term expected power
2 costs. I also find that the Proposed Investment increases PGE's short and long
3 term general business risk. Based on these findings, I recommend that the
4 Commission not approve PGE's requests related to the Production Investment.
5 Should the Commission decide to allow cost recovery of the Proposed
6 Investment, I provide an alternate framework that minimizes negative impacts
7 to ratepayers.

8 **Q. Please summarize your remaining testimony.**

9 A. The remainder of my testimony addresses Staff's issues in the order raised
10 above.

11

ISSUE 1. PROPOSED INVESTMENT IS NOT COST EFFECTIVE

Q. Please summarize why you believe the Proposed Investment is not cost effective.

A. PGE claims that the Proposed Investment is cost effective.³ The workpapers underlying PGE's claim are effectively a net present value (NPV) analysis. The analysis forecasts costs and revenues over the lifetime of the investment and calculates the net present value of the investment using PGE's current cost of capital.⁴ PGE calculates that the investment has a NPV of [REDACTED].

PGE's model relies on forecasts of production costs, production volumes, and commodity prices. PGE over estimates the commodity price of natural gas liquids (NGL) by 100 percent and over estimates the commodity price of oil by nine percent. After correcting for accurate market prices the Proposed Investment's NPV decreases by [REDACTED] [REDACTED] – from [REDACTED] to [REDACTED].⁵ This means that if PGE's production costs and production quantities are as forecast, the Proposed Investment will increase net power cost (NPC) by \$1 for every \$4 invested. If production volume and cost estimates are not correct, the loss could be even greater.

Q. You state that PGE over estimates commodity prices. Please support this claim.

³ See PGE/700, Sims – Tooman/2, lines 3 and 4.

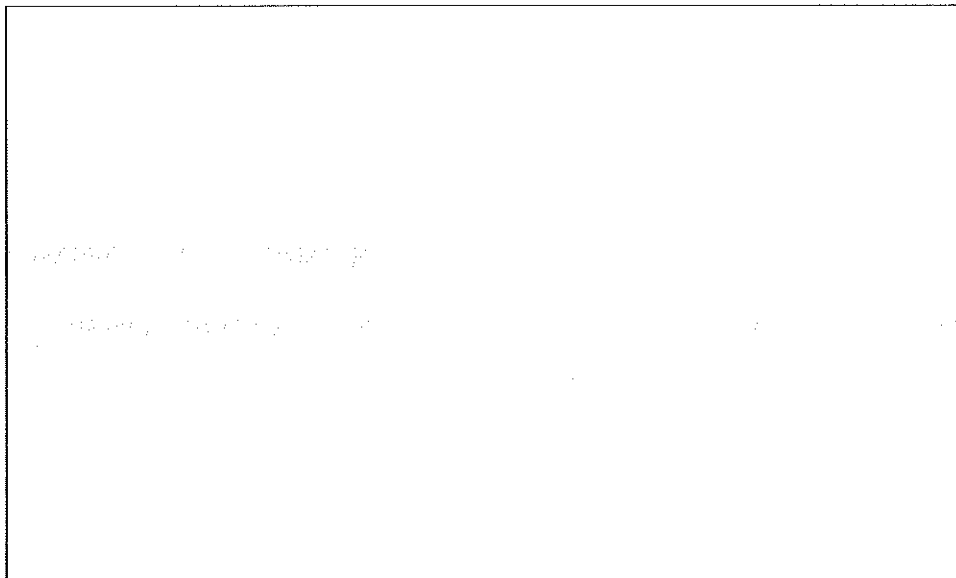
⁴ See Staff/501.

⁵ See Staff/502.

1 A. PGE forecasts production revenues by forecasting an annual sale price for
2 natural gas, NGLs, and crude oil. PGE's forecast of market prices relies on the
3 NYMEX commodity futures market for the first few years and on McKenzie
4 Woods forecasts for the remaining years. PGE's July 15, 2016, Monet Update
5 contains a reasonable natural gas forecast. However, the forecast used for
6 NGLs and crude oil prices is not reasonable. Figure 1 below is PGE's forecast
7 for the production value of the Proposed Investment's oil and NGL.

8 **BEGIN CONFIDENTIAL**

9



10

11 **END CONFIDENTIAL**

11

12 PGE expects to sell both oil and NGL at [REDACTED] per barrel by 2024. In its
13 NPV model, PGE prices both crude oil and NGL price per barrel to be
14 equivalent to West Texas Intermediate (WTI) crude oil. Staff does not dispute
15 PGE's forecast for WTI, but rather the relationship between WTI price index
16 and the price that can be expected for [REDACTED] production. PGE admits that

1 NGL has historically been valued at half the price of WTI crude, stating in
2 response to a Staff Data Request:

3
4 The oil and gas industry commonly uses the oil index price as a
5 frame of reference against historically realized NGL revenues.
6 The operations in close proximity to the proposed transaction
7 have historically realized NGL revenues roughly equivalent to
8 50% of the NYMEX WTI crude oil index price per barrel of
9 NGLs.⁶

10
11 Staff reduces the NGL price used in the NPV model to be equal to
12 50 percent of the forecasted WTI price.

13 PGE values its forecasted crude oil production at the WTI crude oil
14 forecast price. However, PGE's oil production is based in [REDACTED]. Energy
15 Information Agency data⁷ show that oil produced in Texas generally sells for
16 9 percent more than crude oil produced in [REDACTED]. Figure 2 shows the price
17 of [REDACTED] crude relative to Texas crude.

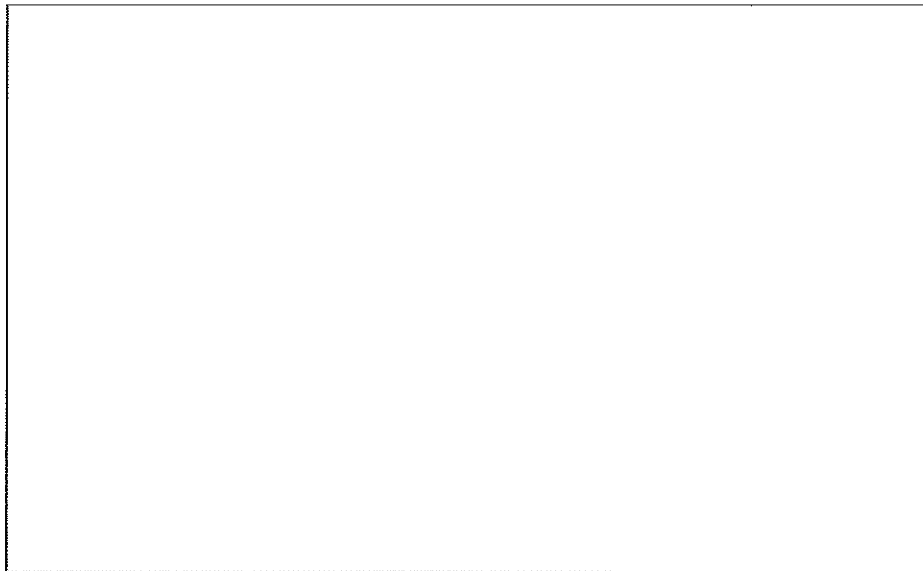
18 **BEGIN CONFIDENTIAL**

⁶ See, Staff/503 (PGE Response to Staff DR 23). PGE's response is also supported by EIA data. On August 8, 2016, propane traded at \$18.06 per barrel, while WTI traded at \$41.83 per barrel. (<https://www.eia.gov/todayinenergy/prices.cfm>, accessed August 8, 2016)

⁷ See, https://www.eia.gov/dnav/pet/PET_PRI_DFP1_K_M.htm accessed 8/2/2016.

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[REDACTED]



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[REDACTED] crude has sold for less than Texas crude oil every month since August 1980. Staff modifies the NPV model to account for the historic relationship between the value of [REDACTED] and WTI crude. Over the last 10 years, [REDACTED] crude has sold at 89 percent of the average Texas price. Staff adjusts the price received for [REDACTED] crude to be 89 percent of the WTI price forecast.

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Q. What is the impact of Staff's changes to production valuation?

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A. The value of the proposed investment is highly dependent on the price received for non-gas sales. Crude oil and NGL account for about half of the production value of the proposed wells. PGE does not use crude oil or NGL, and assumes that they will be sold to the market. As a result, modifying the forecasted crude oil price has a large impact on the value of the investment. The combined impact of correcting the price for the two commodities is a

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1 \$ [REDACTED] in the value of the investment, from [REDACTED] to
2 [REDACTED].⁸

3 **Q. Please explain how production costs are calculated.**

4 A. PGE calculates production cost using a revenue requirement model. The
5 revenue requirement model forecasts operating costs, depreciation, depletion,
6 taxes, and capital carrying costs. Most operating costs are set at a base level
7 and escalated over the production period at an inflation rate of [REDACTED]
8 Other production costs such as transportation are indexed to production
9 volumes. PGE uses current values for property tax rate, income tax rate, and
10 weighted average cost of capital.

11 **Q. Please summarize Staff's analysis of the revenue requirement model.**

12 A. At this time Staff has no objections to the cost side of the revenue requirement
13 model. The annual revenue requirements of PGE's model are provided in the
14 "Total Revenue Reqmts" column of Exhibit Staff/501, Kaufman/2.

15 Staff has reviewed the cost assumptions and mechanics of the model.
16 The mechanics of the revenue requirement model are sound. The cost
17 assumptions that can be easily validated such as tax rate and cost of capital
18 are reasonable. Staff does not currently have a basis to verify the
19 reasonableness of components specific to gas exploration and production.
20 However, a finding that the production cost forecasts are too low would not
21 change Staff's conclusions.

⁸ See Staff/502. Staff also tested the impact of keeping NGL at 100 percent of WTI but adjusting the crude oil price as described above. This resulted in an NPV of negative [REDACTED]

1 **ISSUE 2. THE VALUE OF THE PROPOSED INVESTMENT IS UNCERTAIN**

2 **Q. PGE claims that the production guarantees reduce the Proposed**
3 **Investment's risk. What is the financial impact of triggering the**
4 **minimum production guarantee?**

5 A. With the correct commodity prices, the expected NPV of the project is [REDACTED]
6 [REDACTED]. If production decreases to [REDACTED] of the expected amount,
7 the NPV reduces by [REDACTED] to negative [REDACTED]. Under PGE's
8 proposed commodity prices a production decrease to [REDACTED] reduces NPV
9 from [REDACTED], a reduction of over 100 percent. Even
10 in the optimistic scenario of hitting the production cap of 110 percent, the
11 Proposed Investment has a negative NPV of [REDACTED].

12 **Q. How does a 10 percent reduction in commodity prices used by Staff**
13 **affect the value of the Proposed Investment?**

14 A. A 10 percent reduction in the expected commodity prices reduces the value of
15 the investment from [REDACTED] to [REDACTED]. The
16 optimistic scenario of a 10 percent increase in the expected commodity prices
17 has a [REDACTED].

18 **Q. Does PGE's analysis include any contingency expenses?**

19 A. No. PGE's analysis does not include contingency expenses. If the analysis
20 includes 10 percent adder for contingencies the NPV decreases from [REDACTED]
21 [REDACTED] to [REDACTED]. The optimistic scenario of a 10 percent
22 reduction in expenses has a [REDACTED].

1 **Q. So with respect to all three factors – production quantity, price, and**
2 **cost, the optimistic scenario is still bad for customers?**

3 A. That is correct. Staff adjusted the three factors in customer's favor by
4 10 percent each. For every factor the investment continued to have a negative
5 NPV.

6 **Q. You have evaluated three separate negative scenarios: low production,**
7 **low commodity prices, and unexpected expenses. What is the value of**
8 **the investment if all three scenarios occur simultaneously?**

9 A. If all three negative outcomes occur simultaneously the NPV of the project is
10 negative [REDACTED]. This loss occurs on a [REDACTED] investment, for every
11 [REDACTED].

12 **Q. Are the three scenarios reasonable?**

13 A. Yes, these are reasonable scenarios. A 10 percent reduction in expected gas
14 prices has been a common event over the last decade. Similarly, Commission
15 experience with other projects shows production shortfalls and cost overruns
16 exceeding 10 percent are not unreasonable.

17 **Q. So despite the production guarantee, is there a reasonable scenario**
18 **where PGE loses nearly all the investment?**

19 A. Yes.
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ISSUE 3. PROPOSAL ADDS TO PGE'S COST OF CAPITAL

Q. Please summarize your findings related to the risk of the proposed investment.

A. Staff expects the Proposed Investment will increase risk to PGE investors. The added risk to investors will likely cause PGE's cost of capital, and subsequently customer rates, to increase. The cost effectiveness of the Proposed Investment is highly sensitive to price, production, and cost assumptions. The Proposed Investment and the supporting analysis rely on Production Partner's participation as an operating partner. PGE does not have the expertise to operate the wells. In the event that Production Partner ceases to operate the wells, PGE will have to renegotiate a new contract, at potentially unfavorable terms.

Production Partner Credit Risk

Q. Please provide a succinct background for PGE's Production Partner.

A. [BEGIN CONFIDENTIAL] [REDACTED]
[REDACTED]
[REDACTED]
[REDACTED]
[REDACTED]
[REDACTED]
[REDACTED]

⁹ See "EOG Warns of \$44 Million Hedging Loss" by Paul Ausick in the July 15, 2016, Wall Street Journal (WSJ).

- 1 [REDACTED]
- 2 [REDACTED]
- 3 [REDACTED]
- 4 [REDACTED]
- 5 [REDACTED]
- 6 [REDACTED]
- 7 [REDACTED]
- 8 [REDACTED]
- 9 [REDACTED]
- 10 [REDACTED]
- 11 [REDACTED]
- 12 [REDACTED]
- 13 [REDACTED]
- 14 [REDACTED]
- 15 [REDACTED]
- 16 [REDACTED]
- 17 [REDACTED]
- 18 [REDACTED]
- 19 [REDACTED]
- 20 [REDACTED]
- 21 [REDACTED]

- 1 [REDACTED]
- 2 [REDACTED]
- 3 [REDACTED]
- 4 [REDACTED]
- 5 [REDACTED]
- 6 [REDACTED]
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- 8 [REDACTED]
- 9 [REDACTED]
- 10 [REDACTED]
- 11 [REDACTED]
- 12 [REDACTED]
- 13 [REDACTED]
- 14 [REDACTED]
- 15 [REDACTED]
- 16 [REDACTED]
- 17 [REDACTED]
- 18 [REDACTED]
- 19 [REDACTED]
- 20 [REDACTED]
- 21 [REDACTED]
- 22 [REDACTED]
- 23 [REDACTED]

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[REDACTED]

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[REDACTED]

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[REDACTED]

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[REDACTED]

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[REDACTED]. [END CONFIDENTIAL]

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Q. Is the industry that Production Partner operates in low risk?

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A. No. Between January 1, 2015, and May 16, 2016, 64 bankruptcies have

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occurred in the oil and gas exploration sector.¹⁰ Bankruptcies continue despite

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rebounds in crude prices.¹¹ Associated investment banks have loaned

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substantial money to companies in this industry and these banks now have an

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incentive to arrange transactions in which monies due the coordinating bank or

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investment group are repaid out of new debt obligations of new investors.

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Proposed Investment is not a reasonable hedging instrument

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Q. What is PGE's primary justification for the Proposed Investment?

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A. PGE's primary justification for the proposed investment is to reduce long term

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gas price uncertainty. PGE claims that this is done primarily for the benefit of

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customers.

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Q. How does the Proposed Investment impact customers' rate risk?

¹⁰ See "Oil bankruptcies mount despite crude rebound", CNN, <http://money.cnn.com/2016/05/16/investing/sandridge-energy-oil-bankruptcy/> accessed August 9, 2016.

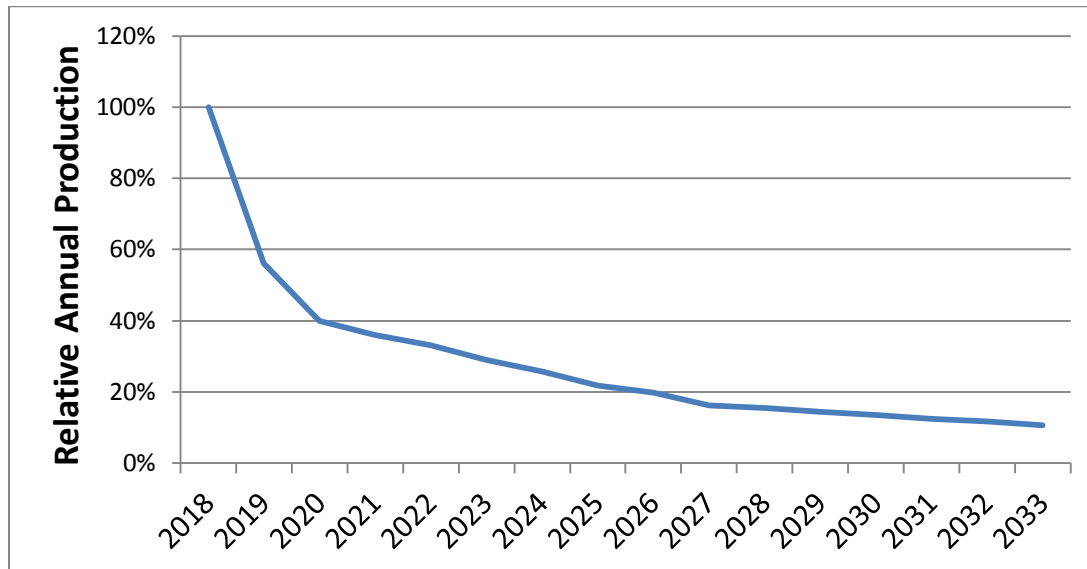
¹¹ See "Oil bankruptcies mount despite crude rebound", CNN, <http://money.cnn.com/2016/05/16/investing/sandridge-energy-oil-bankruptcy/> accessed August 9, 2016.

1 A. The Proposed Investment has an ambiguous impact on risk. There is likely
2 some positive correlation between the value of the proposed investment and
3 natural gas prices. The correlation means that when PGE's gas costs
4 increase, the value of the proposed investment also increases. The correlation
5 is limited; however, because approximately half the production value is tied to
6 oil prices. PGE has failed to provide analysis quantifying the expected
7 relationship between PGE's gas costs and the value of the Proposed
8 Investment.

9 An additional limitation in the value of the Proposed Investment as a risk
10 reduction instrument is that the annual production volumes decline sharply in
11 the first few years of the hedge. Production decreases 60 percent in the first
12 two years of full production, and by 10 years after drilling is complete
13 production reduces to 16 percent of the original level. This means that the vast
14 majority of the value of the Proposed Investment could be hedged with a 10
15 year financial hedging instrument.

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Figure 2 Relative Annual Production Value



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PGE's proposal introduces substantial production cost and liability uncertainty. Neither of these two counteracting forces on PGE's risk has been quantified. This makes the Proposed Investment a relatively ineffective hedge compared to a traditional financial hedging instrument.

Q. If the Proposed Investment does not resemble a financial instrument, what does it resemble?

A. It is very similar to simply purchasing stock in a gas production firm. The value of the stock will increase and decrease with the forward gas price curve.

Q. What disadvantage is there in PGE hedging by purchasing stock in gas production firms?

A. If PGE invests heavily in gas production firms, PGE's cost of capital may increase. Gas production firms have higher costs of capital compared to regulated utility firms.

1 **Q. Do you believe that there is another way for customers to reduce their**
2 **long term gas risk?**

3 A. Yes, PGE is essentially proposing to impose investment in gas exploration and
4 production on its customers. This is a type of investment decision that
5 individual customers can already make on their own. If individual PGE
6 customers feel over exposed to long term gas price risk, they can make
7 investments equivalent to the one proposed by PGE by directly investing in
8 E&P firms.

9 *Cost of Capital impacts to PGE with a Gas E&P Subsidiary*

10 **Q. What is PGE's credit status now?**

11 A. PGE's FMBs are currently rated as:

Moody's: A1

S&P: A-

12 PGE's Unsecured Long-Term Debt is currently rated as:

Moody's: A3

S&P: BBB

13 **Q. Is PGE working towards an S&P upgrade?**

14 A. Yes, PGE filed testimony in 2015 stating "PGE will continue to pursue an
15 upgrade from S&P, which would help lower financing costs for customers
16 through lower pricing on revolving lines of credit and new debt."¹²

17 **Q. Given the differential between Moody's and S&P what would be the**
18 **impact of an S&P upgrade of PGE's credit ratings?**

¹² See UE 294 PGE/1000, Hager – Greene/5, lines 8 to 10.

1 A. Because revolving credit facilities, letters of credit and other financial
2 instruments are based on the higher of S&P vs. Moody's ratings when rating
3 are only one notch apart, PGE would see lower costs in all its financing activity.

4 **Q. And ratepayers would see the benefits?**

5 A. Yes.

6 **Q. What would be the credit impact of PGE forming a natural gas E&P
7 division?**

8 A. Rating agencies would be less likely to upgrade PGE, and would likely review
9 PGE for downgrade.¹³ PGE notes that it has not communicated with credit
10 rating agencies regarding the proposed investment.¹⁴

11 **Q. Would ring fencing fully insulate the pure utility operations of PGE?**

12 A. No. PGE admits that ring fencing cannot fully insulate PGE's utility operations
13 from affiliated interest risk.¹⁵ PGE proposes that any impact on cost of capital
14 be passed on to customers.¹⁶

15 **Q. Suppose after the Proposed Investment PGE's credit rating remains
16 unchanged. Does this mean the investment did not harm ratepayers?**

17 A. No. If the Proposed Investment prevents PGE from receiving a rating upgrade,
18 PGE customers will experience an opportunity cost of not having lower interest
19 rates.

¹³ Regarding its recent sale MDU Resources CEO stated "Exiting the E&P business lowers our risk profile, and it allows us to focus more on growing our other business operations." See <http://www.mdu.com/news/2016/04/05/mdu-resources-completes-sale-of-oil-and-natural-gas-assets> accessed August 8, 2016.

¹⁴ See Staff/503, Kaufman/2.

¹⁵ See Staff/503, Kaufman/3.

¹⁶ See Staff/503, Kaufman/4.

ISSUE 4. TIMING OF COSTS AND BENEFITS ARE NOT MATCHED

Q. PGE claims that the project has a long term cost per therm below the forward price curve for natural gas. Does this mean that all customers are expected to benefit from the investment?

A. Not all customers benefit from PGE's Proposed Investment. According to PGE, the annual cost of the investment will exceed the benefits in the first six years of the project. PGE proposes passing the excess costs to customers in the year that they occur. However, PGE has access to existing medium term hedging products that can provide the same level of cost stability without the sizeable increase in total fuel cost.

The primary customer benefit under PGE's assumptions occurs from 2028 to 2038. This means that current customers are paying higher than market gas prices so that future customers can pay lower than market prices.

Q. Is it possible to appropriately match the costs and benefits of the Proposed Investment?

A. Staff contends that there are no net benefits. However, even for a project with negative net present value, it is possible to more fairly allocate the costs. PGE could defer production costs from periods of relatively higher costs to periods of relatively lower costs.

Q. If the Commission approves cost recovery for this investment, should the Commission approve an increase to PGE's 2017 NVPC?

A. No, even if the Commission approves cost recovery for this investment, the Commission should not approve an increase to PGE's 2017 NVPC. Given that

1 PGE finds a positive net present value for this investment, PGE should
2 structure cost recovery of the project so that customers experience a portion of
3 the gains in every year. This would result in lower power costs for every year
4 of the Proposed Investment.

5 **Q. Given the analysis you have presented what is your proposal?**

6 A. I propose that the Commission exclude costs of the Proposed Investment from
7 PGE's NVPC and deny PGE's request for approval of an AI Agreement with
8 PGGS, and deny PGE's request to waive the rule requiring that transactions
9 pursuant to AI agreements be priced at lower of cost or market. I also
10 recommend that the Commission decline to adopt PGE's proposed hedging
11 guidelines.

12 **Q. If the Company continues with the Proposed Investment do you have**
13 **any recommendations for rate recovery?**

14 A. Yes. If PGE executes the Proposed Investments, PGE intends to also sign a
15 long term gas supply contract with its new affiliate, PGGS.¹⁷ Rather than a
16 cost of service contract, the annual contract price should be shaped so that
17 there is no inter-temporal cost shifting. The price should also be fixed so that
18 the contract results in NPV gas costs \$4 million below what would be achieved
19 with the current forward price curve. A fixed price contract will prevent
20 ratepayers from bearing the burden of any incorrect analysis in PGE's
21 proposal. However, a fixed price contract does not protect customers from
22 cost of capital impacts of the proposed investment. Even after the fact, these

¹⁷ See PGE/100, Tinker – Sims/19, lines 19 and 20.

1 impacts would be difficult to measure. Parties should work together to identify
2 a way to prevent customers from paying any cost of capital increases related to
3 the Proposed Investment.

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

5 A. Yes.

CASE: UE 308
WITNESS: LANCE KAUFMAN

**PUBLIC UTILITY COMMISSION
OF
OREGON**

STAFF EXHIBIT 501

**Exhibits in Support
Of Opening Testimony
(Long-Term Hedging)**

August 12, 2016

Staff/501
Kaufman/1

Exhibit 501 is confidential and is subject to

Protective Order No. 16-137

CASE: UE 308
WITNESS: LANCE KAUFMAN

**PUBLIC UTILITY COMMISSION
OF
OREGON**

STAFF EXHIBIT 502

**Exhibits in Support
Of Opening Testimony
(Long-Term Hedging)**

August 12, 2016

Staff/502
Kaufman/1

Exhibit 502 is confidential and is subject to

Protective Order No. 16-137

CASE: UE 308
WITNESS: LANCE KAUFMAN

**PUBLIC UTILITY COMMISSION
OF
OREGON**

STAFF EXHIBIT 503

**Exhibits in Support
Of Opening Testimony
(Long-Term Hedging)**

August 12, 2016

July 28, 2016

TO: Kay Barnes
Oregon Public Utility Commission

FROM: Patrick Hager
Manager, Regulatory Affairs

**PORTLAND GENERAL ELECTRIC
UE 308
PGE Response to OPUC Data Request No. 023
Dated July 14, 2016**

Request:

Please refer to the file produced in response to OPUC DR 1 named “OPUC_DR_001_Attach D_CONF.xlsx” sheet named “Assumptions” cell F71. Please explain why the forecast for natural gas liquids is identical to the forecast for crude oil. Please provide any supporting documentation.

Response:

Natural gas liquids (NGLs) are molecules in the same hydrocarbon family as natural gas and crude oil. NGLs include many different marketable products such as ethane, propane, butane, isobutane, and pentane. Market conditions determine which NGLs will be processed and sold separate from the oil and natural gas revenue stream. The precise allocation of marketable products can be difficult to determine at any particular time so precise forecasting is problematic. The oil and gas industry commonly uses the oil index price as a frame of reference against historically realized NGL revenues. The operations in close proximity to the proposed transaction have historically realized NGL revenues roughly equivalent to 50% of the NYMEX WTI crude oil index price per barrel of NGLs.

July 28, 2016

TO: Kay Barnes
Oregon Public Utility Commission

FROM: Patrick Hager
Manager, Regulatory Affairs

**PORTLAND GENERAL ELECTRIC
UE 308
PGE Response to OPUC Data Request No. 028
Dated July 14, 2016**

Request:

Please provide all communication between PGE and its credit rating agencies regarding the potential impact of the proposed partnership [for long-term gas hedging].

Response:

PGE does not have any material responsive to this request. PGE and the counterparty are under a strict confidentiality agreement and all details of the proposed transaction are not available to the rating agencies.

July 28, 2016

TO: Kay Barnes
Oregon Public Utility Commission

FROM: Patrick Hager
Manager, Regulatory Affairs

**PORTLAND GENERAL ELECTRIC
UE 308
PGE Response to OPUC Data Request No. 042
Dated July 14, 2016**

Request:

Is PGE immune to all of the proposed affiliate's liabilities including but not limited to financial and environmental liability?

Response:

PGE objects to this data request on the grounds that it seeks a legal conclusion and is vague and ambiguous. Without waiving the foregoing objection, PGE provides the following response:

Under basic corporate law principles, shareholders are not responsible for liabilities of the companies in which they have an ownership interest except in extraordinary circumstances. The term "immune" is not defined but if the question is whether PGE is guaranteed that it could never be liable under any conceivable set of facts or circumstances for financial or environmental liability in connection with PGGS, the answer, based on the foregoing general principle, is "no."

July 28, 2016

TO: Kay Barnes
Oregon Public Utility Commission

FROM: Patrick Hager
Manager, Regulatory Affairs

**PORTLAND GENERAL ELECTRIC
UE 308
PGE Response to OPUC Data Request No. 048
Dated July 14, 2016**

Request:

If PGE's cost of capital increases as a result of the proposed partnership, would PGE propose passing this increased cost on to PGE customers? If no, what mechanisms does PGE propose to insulate PGE customers from the cost of capital impacts?

Response:

In the event that PGE's cost of capital is impacted, PGE would pass the decreased or increased cost on to customers as it would with other regulated investments.