

UE 335 / PGE / 100
Pope – Lobdell

BEFORE THE PUBLIC UTILITY COMMISSION
OF THE STATE OF OREGON

UE 335

Policy

PORTLAND GENERAL ELECTRIC COMPANY

Direct Testimony and Exhibits of

Maria Pope
Jim Lobdell

February 15, 2018

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I. Introduction

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

2 A. My name is Maria Pope. I am the President and Chief Executive Officer of PGE.

3 My name is Jim Lobdell. I am the Senior Vice President of Finance, Chief Financial
4 Officer, and Treasurer of PGE.

5 Our qualifications appear at the end of this testimony.

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

7 A. The purpose of our testimony is to:

- 8 • Describe the context of this filing and our customers' expectations;
- 9 • Discuss PGE's operational excellence and continuous improvement efforts;
- 10 • Summarize the proposed average price increase of approximately 4.8% and
11 discuss our efforts to mitigate the impact of the price increase, in keeping with our
12 long-term strategy of providing affordable and safe energy for customers; and
- 13 • Identify our other key proposals.

14 Our testimony is organized according to these objectives.

15 **Q. Please provide a brief description of PGE.**

16 A. PGE is a vertically-integrated regulated electric utility company. We proudly serve more
17 than 870,000 customers in 51 cities within Oregon, including the City of Portland, which is
18 one of the fastest growing regions in the country. With more than 2,900 employees across
19 the state as of December 31, 2017, we are committed to building a cleaner, more reliable,
20 and more efficient energy future. Given our customers' interests, we have the number one
21 voluntary renewable energy program in the country. Certain cities in our service territory

1 have proclaimed resolutions to move to 100% renewable power, and more than 170,000
2 PGE customers voluntarily participate in our renewable power program.

3 Our service territory includes 4,000 square miles, primarily in and around the Portland
4 and Salem metropolitan areas, and we are headquartered in Portland, Oregon.

5 **Q. Please state PGE’s mission and core strategy.**

6 A. For more than 128 years, we have been delivering safe, reliable and affordable energy to
7 Oregonians. Today, our industry is faced with new challenges driven by changing customer
8 expectations and rapidly evolving technology. In addition to safe, reliable and affordable
9 energy, customers today also want their energy to be cleaner and more secure. By cleaner,
10 we mean that our customers want us to reduce carbon emissions; by more secure, we mean
11 that the grid and our systems are secure from physical and cyber-attacks.

12 During the past year, PGE’s officer team has been working together to update our
13 company strategy to guide us towards achieving the needs and expectations of our customers
14 and other stakeholders. As a result, we have revitalized our Strategic Direction with four
15 key strategies to address our customers’ changing expectations. Our strategies include:

- 16 • **Deliver** exceptional customer experiences;
- 17 • **Invest** in a reliable and clean energy future;
- 18 • **Build** a smarter, more resilient grid; and
- 19 • **Pursue** excellence in our work.

20 **Q. How do you manage the company to PGE’s mission and core strategy?**

21 A. First, employees have to understand and embrace the Strategic Direction and what it means
22 for our work. We have been meeting with employees around the company to discuss the
23 refreshed strategy and answer questions. This is an important piece of building culture and

1 employee buy-in. In terms of the day-to-day work, we use scorecards with clearly stated
2 goals and metrics for evaluating progress against our strategies. The scorecards also include
3 improvement plans for controlling our costs, improving our efficiency, and improving the
4 customer experience.

II. Context and Customers' Expectations

1 **Q. What are your goals for PGE?**

2 A. First and foremost: to deliver safe, reliable, affordable, clean, and secure energy to our
3 customers with excellent customer service while complying with all applicable laws and
4 regulations. Our company values guide how we do this and reflect our commitment to our
5 customers, employees, community, and shareholders. As we are successful, we will: 1) be
6 viewed by our customers as their most trusted energy partner; 2) be a preferred employer,
7 attracting and retaining exceptional employee talent; 3) maintain our standing as a caring
8 and invested community partner; and 4) attract capital investors by offering a competitive
9 return on capital invested and maintaining our investment-grade ratings.

10 **Q. What does your most recent research tell you about your customer expectations and**
11 **priorities?**

12 A. The top three priorities for PGE customer are outage restoration, affordable rates, and
13 generation of energy using environmentally-friendly resources.

14 Additionally, , more than 80% of our customers say that the following are "very
15 important" expectations they have of PGE:

- 16 • Protect grid from cyber-attacks and other threats;
- 17 • Minimize outages; and
- 18 • Provide great customer service.

19 **Q. How are changing customer demographics and the increased reliance on digital**
20 **products affecting your customers' expectations?**

21 A. Our research shows the following characteristics about PGE's customers and electricity
22 customers in the United.States. in general:

- 1 • Millennials and successive generations already comprise about one quarter of
2 PGE's customer base. It's expected that they will comprise half (or more) of
3 Oregon's population within 10 years;
- 4 • Most PGE customers (73%) provide us with a mobile phone number rather than a
5 landline. This demonstrates our customers' preference for mobile devices as a
6 channel of contact and engagement;
- 7 • Younger customers (Millennials/Generation Y) contact their electric utility two to
8 three times as often as customers of other generations; and
- 9 • Younger customers also use a much wider variety of methods/channels to engage
10 with their electric utility.

11 **Q. How important is reliability to your customers and to U.S. electricity customers in**
12 **general?**

13 A. From PGE's participation in the JD Power Electric Utility Business Customer Satisfaction
14 surveys we've learned that:

- 15 • Reliability is one of the most important drivers of customers' satisfaction with
16 their electric utility;
- 17 • The importance of reliability in the JD Power model has increased four
18 percentage points in the last 10 years (2007 model to 2017 model); and
- 19 • When PGE does not meet our customers' reliability and outage restoration
20 expectations, overall satisfaction declines. Performing poorly on reliability and
21 outage restoration today is even more impactful than it was 10 years ago. This
22 indicates customers are less tolerant of shortfalls (have higher performance

1 expectations) today compared to 2007. This pattern is evident for the industry
2 overall and can be more pronounced among PGE customers.

3 **Q. What are you doing to meet your commitments to your customers?**

4 A. We are balancing the safety, service, reliability, and security our customers expect with
5 keeping energy prices affordable. We do this by focusing on:

- 6 • Providing a safe and reliable power supply with resources sufficient to meet peak
7 demands;
- 8 • Replacing infrastructure that has reached the end of its useful life, such that it
9 threatens system reliability and safety;
- 10 • Protecting our system from external physical and cyber threats;
- 11 • Responding quickly to outages, account services requests, and inquiries;
- 12 • Providing excellent customer service; and
- 13 • Implementing programs designed to enhance customer options and experience,
14 and using proven technology to test customer interest and participation, while
15 weighing the costs and benefits.

16 **Q. How do your customers' changing expectations influence the services PGE delivers and**
17 **associated costs?**

18 A. In order to provide the services customers expect, our systems are experiencing significant
19 and continuous evolution, and are now more connected and integrated than ever before. In
20 addition to dedicating more resources to keep the lights on, we also require incremental
21 resources to provide smarter cyber capabilities with safe security platforms. In 2017, our
22 Information Security Program developed a comprehensive, tiered governance model for the

1 security program that encompasses all business units. PGE Exhibit 600 discusses these
2 issues and their incremental costs in more detail.

3 **Q. In addition to the need to respond to changing customer expectations, how do**
4 **economic conditions impact PGE?**

5 A. Economic activity in our service territory has been driving in-migration, growing customer
6 count, and increasing customer connects and demands on our systems. These activities
7 generate an increase in customer calls, especially during outages, and a higher overall
8 volume of work.

9 **Q. How is energy efficiency affecting PGE's load growth?**

10 A. Typically, customer count growth results in load growth. However, as shown in our recent
11 integrated resource plans, energy efficiency is partially offsetting load growth that would
12 otherwise be expected to accompany population and economic expansion. The Energy Trust
13 of Oregon expects to achieve incremental energy efficiency savings of 1.6% of net system
14 load or 34 MWa in 2019, which is in addition to significant non-sponsored energy efficiency
15 savings achieved by our customers.

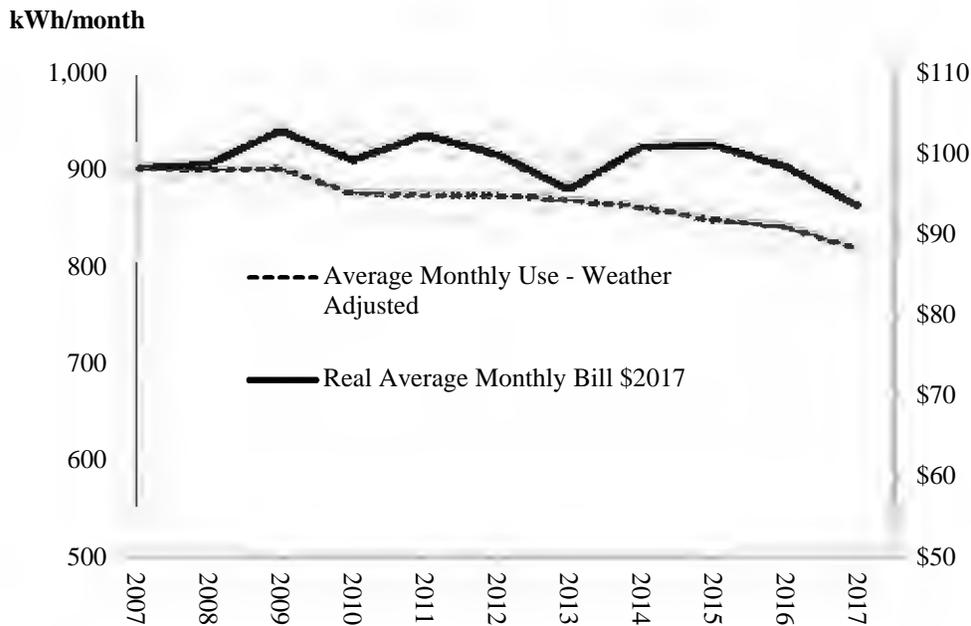
16 **Q. Over the longer term, does modest load growth and increasing energy efficiency create**
17 **regulatory challenges?**

18 A. Yes. Historically for PGE, as well as the industry as a whole, growth in retail loads
19 produced net margin that enabled us to absorb normal inflationary cost increases and
20 incremental fixed costs. As load growth slows, we are faced with a need to increase
21 customer prices, such that forecast revenues and forecast costs are aligned in order to allow
22 for the opportunity to earn a reasonable return and maintain access to lower cost capital
23 markets.

1 **Q. Does PGE support energy efficiency?**

2 A. Yes. We support cost effective energy efficiency because it benefits our customers and our
3 service area in many ways. In addition to being better for the environment, energy
4 efficiency decreases the need for adding new resources to the system, maintain lower costs
5 for customers. Even as the price per kilowatt hour goes up, a reduction in total kilowatt
6 hours used by the average customer helps to offset the bill impact. Figure 1 below, shows
7 that average inflation-adjusted residential bills were roughly the same in 2007 and 2017.
8 Energy efficiency has reduced average monthly residential usage by 9% over the same time
9 period.

Figure 1
Average Residential Use and Bill 2007-2017



III. Operational Excellence and Continuous Improvement

1 **Q. Please discuss PGE’s pursuit of operational excellence.**

2 A. We pursue operational excellence in all aspects of our business. Operational excellence
3 begins with keeping our customers, employees, and the general public safe as it relates to
4 our electric infrastructure, as well as providing excellent customer service and reliability in
5 our transmission, distribution, generation, and power operations. We are working to meet
6 our customers’ expectations, and our customers are taking notice. According to the JD
7 Power 2017 Electric Utility Business Customer Satisfaction Study, our customers ranked us
8 Number one among large electric utilities in the Western region.

9 To deliver the service customers expect and rely on, we have several initiatives to support
10 operational excellence, including:

11 • **Customer Engagement Transformation (CET):** A multi-year implementation
12 of a program focused on process improvements, business strategies, operational
13 efficiencies, employee development, and replacement of our Customer
14 Information System (CIS) and Meter Data Management System (MDMS). PGE
15 Exhibit 900 provides additional details.

16 • **Transmission and Distribution (T&D) system capital investments:** As
17 discussed in Docket No. UE 319 (UE 319), we are increasing capital investments
18 in our T&D system due to increasing customer-driven work and the need to
19 improve our T&D system to keep it safe and reliable. The capital improvements
20 will enable us to meet our goals and our customers’ expectations related to the
21 reliability, safety, environmental stewardship, and cost effectiveness of the T&D
22 system. PGE Exhibit 800 provides additional details.

1 • **Western Energy Imbalance Market (Western EIM) participation:** During
2 2017, PGE joined the Western EIM, which is a real-time wholesale energy market
3 that automatically dispatches the lowest-cost electricity resources, while
4 optimizing use of renewable energy over a large geographic area. We are now
5 focused on Western EIM enhancements, and analyzing participation in the
6 potential expansion of the California Independent System Operator’s day-ahead
7 market. PGE Exhibit 300 provides additional details.

8 • **Information Technology (IT) systems investments:** These systems are
9 becoming increasingly more critical to all aspects of our operations (with
10 increasing scope, reliance, and use) and we expect this trend to continue in 2019
11 and beyond. In addition, the threats against these systems have increased
12 significantly and become more sophisticated and far reaching. As a result, the
13 level, severity, and consequence of the cyber threat to critical infrastructure
14 providers such as utilities is rapidly increasing. PGE Exhibit 600 provides
15 additional details.

16 **Q. In addition to operational excellence, you mentioned continuous improvement. How is**
17 **PGE continuously improving?**

18 A. Continuous improvement is every employee’s responsibility. All management and
19 individual contributors across the organization are constantly tasked with identifying process
20 improvements and opportunities to avoid costs.

21 **Q. Please explain PGE’s continuous improvement cycle.**

22 A. We remain committed to our continuous improvement cycle and to becoming more efficient
23 and effective in our day-to-day activities. The ultimate responsibility to continually

1 improve is with all our officers and managers. These efforts include benchmarking, which
2 we use to help each functional area understand how we compare to peer companies,
3 identifying best practices, determining areas to improve based on a business case, and
4 implementing our operational efficiency and effectiveness initiatives. These changes
5 typically address improvements for people, processes and/or technology. As discussed in
6 prior General Rate Cases (Docket Nos. UE 262, UE 283, UE 294, and UE 319), we conduct
7 periodic benchmarking to identify areas for improvement and best practices. PGE Exhibit
8 101 shows the functional areas scheduled to conduct benchmarking studies in 2018 and
9 2019.

10 **Q. How long will this benchmarking effort continue?**

11 A. We intend to continue this process for the foreseeable future as part of our corporate
12 Strategic Direction. Our continuous improvement process is an ongoing effort with
13 incremental savings or avoided costs expected over multiple years. In the next section of
14 our testimony, we provide examples of the savings included in our 2019 test year revenue
15 requirement.

IV. Summary of Request

1 **Q. Please summarize PGE’s request in this rate case filing.**

2 A. We request that prices be adjusted to yield \$85.9 million of additional revenues, which
3 represents a 4.8% increase overall for cost of service and direct access customers beginning
4 January 1, 2019 (PGE Exhibits 200 and 1300 provide additional details).

5 Additionally, our request includes the impact from the 2017 federal tax legislation¹ (Tax
6 Reform), and new and renewed policy tools to better balance risk and manage price impacts
7 over time, including:

8 1. A request to extend the decoupling mechanism currently slated to expire at the
9 end of the 2019 test year for an additional three years, along with certain
10 modifications to the mechanism as described in PGE Exhibit 1300.

11 2. A request for changes to PGE’s long-term direct access program as described in
12 PGE Exhibit 1300. The changes are:

- 13 • Modify Schedule 129 transition adjustments to reflect fixed generation costs
14 over ten years, with annual updates to fixed generation costs to reflect actual
15 costs; and
- 16 • Allow PGE to petition the Public Utility Commission of Oregon to decertify
17 an Electricity Service Supplier if they do not follow scheduling practices.

18 3. A request to create a balancing account for major storm restoration costs as
19 described in PGE Exhibit 800. PGE has recently experienced greater volatility in
20 year-to-year restoration costs, and our proposal is designed to allow for a better

¹ An Act to provide for reconciliation pursuant to titles II and V of the concurrent resolution on the budget for fiscal year 2018. Public Law Number 115-97.

1 opportunity for PGE to recover its prudently incurred costs and meet our
2 customers' expectations for quick, effective restoration of service, while also
3 managing customer price impacts associated with this greater cost volatility.

4 4. A request, as described in PGE Exhibit 300, to track and true up the forecasted power
5 cost impacts of the difference between:

- 6 • The forecasted online date for new Qualifying Facilities as used in
7 MONET's² Net Variable Power Cost (NVPC) forecast; and
- 8 • The actual on-line date.

9 **Q. What are the primary elements of PGE's filing?**

10 A. Our request is centered on keeping our system safe, reliable, and secure and meeting our
11 customers' expectations for quality service. The specific drivers include:

- 12 • Building a smarter, more resilient grid to support our current customers and
13 growth in our region, while maintaining the safety and reliability our customers
14 count on, including:
 - 15 ○ Strategic Capital Improvements for Customer Risk Reduction – We are
16 upgrading our T&D system, including replacing infrastructure that is reaching
17 the end of its useful life. As described in PGE Exhibit 800, these projects will
18 allow PGE to mitigate significant reliability risks for customers in the T&D
19 system related to aging and environmentally hazardous substation assets,
20 aging conductors in the distribution system, and external causes of service
21 failures in the distribution system (e.g., weather events and vegetation).

² MONET is PGE's Multi-area Optimization Network Energy Transaction model used for power cost forecasting.

- 1 ○ Customer-Driven Capital Work – T&D is seeing an increase in customer-
- 2 driven capital work, primarily in new customer connections. To keep up with
- 3 increasing customer demand, T&D is having to increase its capital labor to
- 4 support the upgrade and expansion of existing infrastructure, as well as
- 5 building new ones (e.g., substations). PGE Exhibit 800 discusses this in more
- 6 detail.
- 7 • Strengthening our IT systems to better guard against cyber-attacks and other
- 8 potential threats. Given the significant increase in threat to the electric sector and
- 9 the consequences of an intrusion, we are accelerating the implementation timeline
- 10 associated with the Information Security Program. At the same time, we are
- 11 embracing and preparing the foundation for expanded cloud-based services. PGE
- 12 Exhibit 600 discusses this in more detail.
- 13 • Upgrading our customer service and billing systems and processes to provide
- 14 better, more secure service to customers. As outlined in PGE Exhibit 900, our
- 15 CET program includes a necessary system upgrade that will allow us to serve our
- 16 customers more effectively and efficiently, and increase protections against cyber
- 17 threats. It focuses on process improvements, business strategies, operational
- 18 efficiencies, employee development, and replacement of our outdated CIS and
- 19 MDMS.
- 20 • An initial NVPC forecast represents an increase of approximately \$39 million.
- 21 PGE Exhibit 300 discusses this in more detail.

- 1 • Higher Property Taxes due to an increase in plant assets, including a full year of
2 Carty Strategic Investment Program, and higher Montana levy rates for Colstrip.
3 PGE Exhibit 200 discusses this in more detail.
- 4 • About \$14 million in reduced revenues based on lower forecasted energy sales.
5 PGE Exhibit 1100 shows our loads are forecasted to decrease in 2019 relative to
6 the forecast used to set prices for 2018. Without resetting prices, we will
7 experience lower revenues and not fully recover our costs.

8 **Q. Please describe the specific impacts of the recent Tax Reform.**

9 A. The Tax Reform includes provisions that directly and indirectly affect PGE's revenue
10 requirement. The most important provision is the lowering of the federal corporate income
11 tax rate from 35% to 21% effective January 1, 2018. This has the immediate effect of
12 reducing PGE's current and deferred income tax expense. Additional impacts on PGE's
13 2019 revenue requirement consist of:

- 14 • Reduction of PGE's accumulated deferred income tax (ADIT) liability;
15 • Elimination of the Domestic Production Activities Deduction;
16 • Adjustment of production tax credits (PTCs) in power costs due to the lower
17 gross-up for taxes; and
18 • Inclusion of the Excess ADIT reversal.

19 PGE Exhibit 200 discusses this in more detail.

20 **Q. Has PGE submitted any other filings in relation to the Tax Reform?**

21 A. Yes. On December 29, 2017, PGE filed for deferred accounting treatment for the expected
22 2017 and 2018 net benefits associated with the provisions implemented through the

1 Tax Reform. Because of the length and complexity of the legislation, PGE will continue to
2 evaluate the Tax Reform's implications.

3 **Q. What actions has PGE taken to mitigate the price increase in this rate case?**

4 A. As our business grows, we work to manage costs and offset the impacts of inflation and
5 other prudent cost increases. To accomplish this, we have taken a number of specific
6 actions including:

7 • Removing 100% of forecasted Officer Long-term Incentive Program costs and
8 50% of all other forecasted incentive compensation costs, even though the entirety
9 of the incentive program benefits customers and is a key part of all investor
10 owned utilities' total compensation.

11 • Removing 50% of certain layers of directors' and officers' insurance.

12 • Requesting a return on equity (ROE) in the lower portion of the range supported
13 by our expert witness Dr. Villadsen. We are proposing a 9.5% ROE consistent
14 with the final result in UE 319, even though interest rates are rising. However, a
15 higher ROE rate would be justified by our expert witness. Dr. Villadsen's range
16 of estimates is between 9.2% and 11.1% and is based on her sample using several
17 methodologies. PGE Exhibit 1000 provides additional details.

18 • Removing certain costs through our rigorous budget process. Additional details
19 are provided below.

20 **Q. You mentioned cost management. How does this rate case reflect your commitment to**
21 **managing your costs?**

22 A. This case reflects the savings achieved through our continuous improvement efforts
23 including some of the ongoing projects discussed above. As described in the Operational

1 Excellence and Continuous Improvement section, our employees' efforts and the use of
2 continuous improvement cycles demonstrate our commitment to managing costs,
3 streamlining processes, learning from others, and creating a culture of continuous
4 improvement at PGE that benefits customers through improved service and reduced long-
5 term cost impacts.

6 At the same time, incorporating cloud-based services in the future will provide us with a
7 new level of flexibility in how we manage and organize our IT capabilities. We expect that
8 utilizing cloud-based services instead of traditional data center services provides more
9 stability and predictability for IT costs. The use of technology has the ability to increase
10 efficiency and reduce enterprise risk, as well as increase financial transparency and enable
11 more informed financial decisions.

12 **Q. Please provide specific examples of how PGE manages its costs.**

13 A. We have provided significant detail in recent years to quantify benefits to customers for the
14 programs, systems, and initiatives being implemented. Please refer to PGE's response to
15 OPUC Data Request No. 558 in UE 319 (provided here as PGE Exhibit 102).

16 Additionally, our 2019 test year includes the following significant cost reductions
17 incorporated into our budget process:

- 18 • Customer Service Operations - CET program related:
 - 19 ○ Reduction of 5.5 full time equivalent employees (FTE) after the systems are
20 stable and operating.
 - 21 ○ Reduction of 5.7 FTEs due to the conclusion of the program management
22 office.
 - 23 ○ Paperless Billing: \$276,000 reduction to the cost of postage and envelopes.

- 1 • T&D: \$1.1 million in lower Contract Labor and Outside Services.
- 2 • Corporate: \$2.5 million annual decrease in the World Trade Center lease
- 3 agreement.

4 **Q. What are the proposed price impacts to various customer schedules in the 2019 test**
5 **year?**

6 A. Similar to UE 319 and due to increases in distribution and IT costs in this rate case,
7 customer classes that use these services more intensively bear a higher burden for the costs,
8 as demonstrated in PGE Exhibit 1300. Table 1 below shows the proposed price changes
9 associated with this case.

Table 1
Estimated Cost of Service Base Rate Impacts Inclusive of Schedule 122

Schedule	Jan. 1, 2019
Schedule 7 Residential	6.3%
Schedule 32 Small Nonresidential	7.1%
Schedule 83 31-200 kW	3.8%
Schedule 85 201-4,000 kW	1.2%
Schedule 89 Over 4,000 kW	2.1%
Schedule 90 100 MWa	3.2%
Cost of Service and Direct Access Overall	4.8%

V. Other Elements of This Filing

1 **Q. What other elements are included in this rate case?**

2 A. Our case includes the following:

- 3 • A forecasted capital structure of 50% equity and 50% debt to allow us to maintain
4 our stable, investment grade credit rating, which will provide the financial
5 strength necessary to allow us access to capital markets, make ongoing investment
6 in our system, and provide access to wholesale fuel and power markets.
- 7 • An increase in the monthly customer charge so that we can recover more of our
8 fixed costs through fixed charges: Residential by \$2.00 per month; small
9 commercial, Schedule 32 single-phase service, by \$3.00 per month; and small
10 commercial, Schedule 32 poly-phase service, by \$6.00 per month. This increase
11 balances the need for fixed-cost recovery, with the principle that the volumetric
12 energy prices provide a price signal for customers to conserve energy.

13 **Q. Will the results of this rate case affect PGE's access to and cost of capital to fund**
14 **investments in the near future?**

15 A. Yes. The results of this case, as filed, will provide us with the opportunity to fund capital
16 investments, meet our financial obligations, and provide an opportunity for our shareholders
17 to receive a reasonable return on their investment. An unfavorable result in this case could
18 lead to higher interest rates on debt issuances and an inability to attract equity capital at a
19 reasonable price, which eventually would raise costs to customers.

1 **Q. Are there other risks of changes to your requested price increase that are not currently**
2 **factored in the costs for the 2019 test year filing?**

3 A. Yes. The Commission is currently running a proceeding to consider changes to the utility
4 business and regulatory models and meet its reporting mandate to the legislature by
5 September 2018, as required by Senate Bill 978. Commission or legislative changes to the
6 business or regulatory models could create substantial impacts on PGE's cost and revenue
7 structures. We have developed the 2019 test year within the context of the current
8 regulatory model and PGE's operations within that model.

9 Additionally, the legislature's short session commenced in February 2018 and the
10 legislature could enact legislation that impacts our business and costs. One key piece of
11 legislation being discussed for action in 2018 is carbon regulation.

VI. Structure of PGE’s Filing

1 **Q. How is PGE presenting this case?**

2 A. We are presenting the following direct testimony:

- 3 • In Exhibit 200, Alex Tooman, Senior Regulatory Consultant, and Marco
4 Espinoza, Senior Regulatory Analyst, summarize the overall 2019 test year
5 revenue requirement, comparing the request with the 2017 actuals. This
6 testimony also discusses our rate base at year-end 2018, plus associated
7 depreciation and amortization, and unbundled results.
- 8 • In Exhibit 300, Managers Mike Niman and Cathy Kim, and Greg Batzler, Senior
9 Regulatory Analyst, provide the initial forecast of our NVPC, discuss updates to
10 parameters and modeling changes, compare the forecast with the final 2018
11 NVPC forecast, and explain why the per-unit expected NVPC have increased.
- 12 • In Exhibit 400, Anne Mersereau, Vice President, Human Resources, Diversity &
13 Inclusion, and Tamara Neitzke, Director of Compensation and Benefits, present
14 our compensation costs for the 2019 test year.
- 15 • In Exhibit 500, Jim Lobdell, Senior Vice President, Finance, Chief Financial
16 Officer and Treasurer, and Greg Batzler, Senior Regulatory Analyst, explain our
17 costs and cost drivers related to corporate support operations, including insurance
18 and research and development.
- 19 • In Exhibit 600, Larry Buttress, Interim Vice President and Chief Information
20 Officer, explains our costs and cost drivers related to IT and cyber security.
- 21 • In Exhibit 700, Bradley Jenkins, Vice President of Power Supply Generation, and
22 Stefan Cristea, Regulatory Analyst, support operations and maintenance (O&M)

1 costs associated with our power supply resources. This joint testimony also
2 discusses recent plant performance.

- 3 • In Exhibit 800, Bill Nicholson, Senior Vice President of Customer Service, T&D,
4 and Larry Bekkedahl, Vice President of T&D, explain our 2019 test year
5 transmission and distribution O&M expenses and capital improvement efforts that
6 will allow us to maintain and enhance our T&D system, discuss our request to
7 modify the current storm accrual, and request the Commission to approve our
8 2017 storm deferral application.

- 9 • In Exhibit 900, Kristin Stathis, Vice President of Customer Service Operations,
10 and Carol Dillin, Vice President of Customer Strategies and Business
11 Development provide a detailed update of the CET program and describe the
12 initiatives that support the customer experience. They also explain customer
13 service O&M costs for the 2019 test year.

- 14 • In Exhibit 1000:
 - 15 ○ Patrick Hager, Manager of Regulatory Affairs, and Chris Liddle, Corporate
16 Finance and Investor Relations Manager & Assistant Treasurer, recommend
17 our cost of capital and capital structure for the 2019 test year; and
 - 18 ○ Bente Villadsen, economist and principal at The Brattle Group, estimates our
19 required ROE and describes the supporting analyses.

- 20 • In Exhibit 1100, Amber Riter, Principal Load Forecasting Analyst, and Alison Lucas,
21 Senior Load Forecasting Analyst, provide the initial load forecast and explain the
22 process and method in forecasting the 2019 test year load.

- 1 • In Exhibit 1200, Robert Macfarlane, Interim Manager, Pricing and Tariffs and
2 Jacob Goodspeed, Senior Regulatory Analyst, describe marginal cost studies for
3 generation, transmission, distribution, customer service, and street lighting.
- 4 • In Exhibit 1300, Robert Macfarlane, Interim Manager, Pricing and Tariffs, and
5 Jacob Goodspeed, Senior Regulatory Analyst, describe how the proposed tariff
6 changes recover our 2019 revenue requirement to achieve fair, just, and
7 reasonable prices for our customers and price changes to various supplemental
8 schedules.

VII. Qualifications

1 **Q. Ms. Pope, please describe your educational background and experience.**

2 A. I am an alumna of the Stanford Graduate School of Business and earned my bachelor's
3 degree from Georgetown University. Prior to joining PGE, I was the chief financial officer
4 of Mentor Graphics Corporation and served in senior operating and finance positions within
5 the forest products and consumer products industries. I joined PGE in 2009 as Senior Vice
6 President of Finance, Chief Financial Officer and Treasurer after serving two years on our
7 board of directors. Most recently, I was the Senior Vice President of Power Supply,
8 Operations and Resource Strategy, overseeing our power supply portfolio, operations —
9 including wholesale power, fuels, marketing, trading and long-term resource strategy — and
10 generation facilities, including 17 thermal, hydro and wind facilities. I entered my current
11 position as President in October 2017 and CEO and member of the board in 2018.

12 I was appointed by Oregon's governor to chair the Oregon Health & Science University
13 governing board, and I serve on the board of Umpqua Holdings Corporation. I have
14 previously served on several other U.S. and Canadian boards.

15 **Q. Mr. Lobdell, please describe your qualifications.**

16 A. I received a Bachelor of Science degree from the University of Oregon in 1984. Since
17 joining PGE as a business analyst in 1984, I have held a variety of positions at PGE and its
18 affiliates. I was senior director of Business Development, director of Internal Audit Services
19 and manager of Financial Risk Management & Pricing, where I provided financial risk
20 management for our wholesale electric and natural gas portfolios. I then served as Vice
21 President of Power Operations and Vice President of Risk Management, Reporting, and
22 Controls & Credit. In 2004, I was named Vice President of Power Operations and Resource

1 Strategy. I entered my current position as Senior Vice President, Finance, Chief Financial
2 Officer, and Treasurer in March 2013.

3 I am a member of the FM Global Advisory Committee, Treasurer of the PGE Foundation,
4 advisory member of the University of Oregon Portland Council, and board member of the
5 ALS Association of Oregon and SW Washington.

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

7 A. Yes.

List of Exhibits

<u>PGE Exhibit</u>	<u>Description</u>
101	Projected Benchmarking Study Schedule
102	UE 319 PGE Response to OPUC DR No. 558

Projected Benchmarking Study Schedule

Dept / Data Year	2018	2019
Finance (F&A)		Planned Benchmark
Transmission & Distribution (T&D)	Planned Benchmark	
Information Technology (IT)		Planned Benchmark
Customer Service		Planned Benchmark
Fleet	Utilimarc	Utilimarc

May 19, 2017

TO: Kay Barnes
Oregon Public Utility Commission

FROM: Patrick Hager
Manager, Regulatory Affairs

**PORTLAND GENERAL ELECTRIC
UE 319
PGE Response to OPUC Data Request No. 558
Dated May 9, 2017**

Request:

Referring to the Company's UE 319 excel work sheet 2014-2018_FTE_W&S_By Operation,RC & Class_01-30-17.xls, at 13-18, UE 294 I PGE I 500, Barnett-Jaramillo/16-17, UE 294 I PGE I 600, Lobdell - Henderson - Tooman I 28 -36, UE 294 I PGE I 800, Nicholson - Bekkedahl I 12, UE 294 I PGE I 900, Stathis - Dillin I 8-13.

Please provide a narrative explaining why the Company's FTE count, including the FTE allocated to the CET deferral, has increased by 302.2 FTE in 2018 over 2016. In the response, please include:

- a. Any and all studies or similar deliverables, whether conducted by consultants or internally, initiated from 2014 to present such as benchmarking studies, management reports, variance analysis, cost report cards, etc. that quantify the gained efficiencies since 2014 and provide evidence that these programs and initiatives are benefiting customers.**

Response:

Narratives explaining the referenced increase in PGE's FTE count have been provided in UE 319 testimony, supporting exhibits, and in numerous responses to data requests. All references to this information is summarized in Attachment 558-A. FTE increases by project will also be provided in PGE's response to OPUC Data Request No. 561, Attachment 561-A.

- a. PGE has provided significant detail in recent years to quantify benefits to customers for the programs, systems, and initiatives being implemented. We summarize these benefits as follows:

1. In PGE's 2014 general rate case (GRC – Docket No. UE 262), we identified significant savings from improvement initiatives. These savings were summarized in PGE Exhibit 201 (provided as Attachment 558-B), which also lists the testimony reference where the savings were discussed in more detail. PGE Exhibit 200 (UE 262, pages 6-10) also included a summary description of the \$15.6 million in annual, on-going savings, which is provided as follows:

PGE has numerous improvement initiatives completed or underway as a result of our benchmarking activities, process improvements, or other activities. Some of these major initiatives are:

- Transmission & Distribution (T&D) Transformation is an effort to improve work processes and leverage technology to improve safety, accountability, standardization, productivity, and efficiency in transmission and distribution. The transformation program projects O&M annual savings of \$3.4 million in 2014. Details can be found in PGE Exhibit 800, Section II.
- Financial Systems Replacement Project (FSRP) replaced PGE's obsolete 26-year old Masterpiece system with a new financial system that enables streamlined workflow and automation of many manual processes. Examples of streamlined workflow include:
 - 40% reduction in cash management processing time; and,
 - Automation of 80% of book-tax adjustments.FSRP, in conjunction with Lean process analysis, allowed for Finance and Accounting (F&A) to realize efficiencies through a net reduction of approximately 11 Full Time Equivalents (FTE) through 2012 and another 4.3 FTEs by 2014. Details can be found in PGE Exhibit 1000, Section II, Part A.
- Procurement Efficiencies via Strategic Sourcing consists of performing spend analysis by utilizing our new financial system (FSRP), identifying business requirements, understanding the marketplace, developing a supply category strategy, evaluating and selecting suppliers, negotiating agreements, developing scorecards to measure supplier performance and then repeating the process to drive continuous improvement. In 2012, PGE negotiated over \$7.6 million of O&M cost savings and \$2.6 million of O&M avoided costs that span multiple years (i.e., \$1.4 million in 2012, \$1.2 million in 2013, \$1.1 million in 2014, and the remaining \$6.5 million after 2014). Details can be found in PGE Exhibit 1000, Section II, Part A.
- Lean Processing in Human Resources – Lean processing is a process improvement methodology that focuses on removing “waste” from processes so that efficiencies in time and resources can be achieved. Waste can be anything from wait time, to errors and re-work, to extra processing. As processes are improved, productive resources can be reallocated to higher-value activities. PGE's Human Resources (HR) has completed 20 Lean processes with more in progress. Details on HR Lean processing efforts can be found in PGE Exhibit 1000, Section II, Part C.

- Employee Benefit Provision Mitigation – Health care reform will have a significant impact on medical plan design and cost as it evolves over the next few years. PGE is monitoring health care reform, and we are evaluating possible future changes to existing benefit plans. In preparation for reform, we have modified many benefit provisions to offset the full effect of increases in benefit costs while maintaining an effective level of benefit support for employees. Some of the benefit changes are:
 - Increasing deductibles and co-pays;
 - Adding additional coinsurance to various plans; and,
 - Offering high deductible plans by each vendor in addition, not in lieu of other offerings.

PGE evaluates if a change in benefit options offered is prudent and if further cost shifting to employees, in terms of out-of-pocket contributions, deductibles and choices of care are appropriate. See PGE Exhibit 500, Section IV for more details on how PGE is working to mitigate benefit cost increases.

- myTime is a web based time collection system (TCS) that will increase accuracy and reduce resources spent on time-keeping processes and payroll. myTime will replace the currently obsolete paper TCS in 2013. PGE projects a reduction in payroll costs of \$1.0 million, which is reflected in wages and salaries in both 2013 and 2014. myTime is explained in more detail in PGE Exhibit 1000, Section II, Part C.
- Information Technology (IT) Vision Design is a roadmap of 15 initiatives directed at improving IT's effectiveness, capabilities, and efficiency over the next three years. Each initiative encompasses one or more of the following six foundational principals: partner with the business; eliminate complexity; source strategically; standardize IT process/procedures; build a strong workforce; and, meet increasing service expectations. Through the 15 initiatives, IT will be able to continue supporting PGE's growing need for technical infrastructure and services while maintaining a relatively flat IT employee count. From 2011 through 2014, we project a net reduction of 7.8 IT FTEs. See PGE Exhibit 600, Section III, Part B for details.
- Generation Excellence. In 2006, PGE's generation organization established the Generation Excellence initiative to focus on improvement efforts such as safety, employee performance, process improvements, and reliability. Generation Excellence has continued to evolve with the establishment of Reliability and Maintenance Excellence (R&ME), which is a comprehensive approach to reliability and maintenance; it encompasses, and better aligns, several sub-initiatives including Reliability Centered Maintenance (RCM) and utilization of our Enterprise Work and Asset Management System (Maximo). R&ME is plant specific and each plant is anticipated to have their strategy in place by the end of 2013. For more detail see PGE Exhibit 700, Section III, Part A.

2. In PGE's 2015 GRC (UE 283), we updated the UE 262 savings plus identified incremental amounts that totaled to \$23.4 million in cumulative annual savings. We summarized these benefits in PGE Exhibit 707 (UE 283) and provide them as Attachment 558-C. Additional detail regarding benefits from the Transmission and Distribution Transformation project (part of PGE's 2020 Vision program) can be summarized as follows:

Maximo, Mobile & Scheduling improves employee safety, heightens accountability, and standardizes our processes, which improves productivity and efficiency in the following ways:

- **Employee Safety:** With mobile devices in the hands of field workers, PGE is able to track work processes being performed and logged when a worker is completing an inspection or doing maintenance work in real-time. The Mobile & Scheduling tools improve employee safety by providing PGE with real-time updates on the location of our field workers and provide a communication link in the field.
 - **Accountability:** Maximo, Mobile & Scheduling provides teams with better accountability data and production information. Supervisors have the ability to review the current status of field crews and details of assigned work. Field workers can update the status of their work, resulting in real-time data for schedulers and supervisors. By having an enterprise wide work and asset management system, we have a clearer, more integrated view of how and where work is being performed within PGE and how to more effectively employ our company personnel and assets.
 - **Productivity:** Productivity should increase as work orders are created in Maximo, and electronically routed and dispatched along with the field workers (including contractors) who are closest to the worksite and possess the appropriate skillset(s) to perform the work. The new technology provides workers with real-time customer and asset information. Mobile & Scheduling tools provide:
 - Optimization of scheduling to reduce travel time and crew costs;
 - An opportunity to re-optimize work schedules dynamically, as needed;
 - Real-time dispatching of work details and status updates; and
 - Automatic asset information updates and work order closures.
 - **Efficiency:** In addition to allowing PGE to track purchasing of inventory stores and materials for work orders, Maximo also provides PGE with the ability to track the rate of use of inventory to optimize stock levels. PGE's goal is to maximize availability of items required for upcoming work while also reducing or removing, as may be appropriate, inventory that is required less frequently or has become obsolete. The reduction in inventory is also expected to reduce the carrying costs associated with that inventory.
3. In PGE's response to OPUC Data Request No. 489, part d, we identified an additional \$3 million to \$5 million in savings associated with PGEs' customer engagement transformation program (CET) based on:

- A reduction of 33 FTEs between 2013 and 2016, which has allowed the customer service organization to reduce its FTE count from 407 in 2012 to the projected 382 in 2018 with some offsetting increases due to other factors such as customer growth.
 - An additional 10.9 FTE reduction is projected in 2019/2020 after the system is stable and operating.
 - Approximately \$1.0 million in non-labor cost reductions due to the paperless billing program. This savings will grow as customer participation in the program increases.
4. In addition to the savings listed above, PGE had also identified additional savings as discussed in the following proceedings:
- In UE 294 (2016 test year GRC, PGE Exhibit 700), PGE reduced its annual production O&M by \$4.5 million based on a change in the maintenance and repair program for the Biglow Canyon wind farm.
 - In UM 1756, PGE deferred for later refund an annual \$1.3 million for the reduced debt cost associated with the issuance of \$140 million in debt in January 2016.
 - In UE 294 (2016 test year GRC, PGE Exhibit 400), PGE discussed the benefits associated with more frequent scheduling and dispatch of PGE's plants. At that time, managing the intra-hour variability of our wind resources on a 15-minute basis (i.e., 30/15 committed scheduling under BPA's Variable Energy Resource Balancing Service) reduced PGE's initial 2016 power cost forecast by approximately \$2.9 million. In UE 319, PGE identified the benefits of moving off of 30/15 committed scheduling as an additional \$2.1 million decrease to PGE's 2018 power cost forecast, net of costs associated with incremental reserve needs to fully self-integrate PGE's owned wind resources.
 - In UE 308 (2017 power cost AUT filing, PGE Exhibit 400) PGE discussed the benefits associated with joining the Western energy imbalance market (Western EIM). The Western EIM is expected to produce several benefits, including sub-hourly dispatch savings, flexible reserve savings, and reliability benefits. Based on a study by Energy + Environmental Economics (E3 – provided as PGE Exhibit 402 in UE 308) the gross savings associated with these benefits was estimated to be \$3.5 million in a 2020 base scenario. In UE 319, PGE provided an updated E3 study (provided as PGE Exhibit 303), which estimated \$5.2 million for similar gross benefits in a 2018 base scenario. Including all costs and benefits associated with Western EIM participation, PGE's net benefit is approximately \$1.0 million in 2018 (see Table 1 of PGE Exhibit 300).

- In UE 189, PGE's submitted its final report to the Commission (November 2, 2012) on actual operational savings derived from PGE's advance metering infrastructure system. The report stated that annual savings totaled \$19.0 million and were expected to increase in 2013.
5. Additional discussion regarding other benefits to customers (i.e., not in the form of hard savings) has been provided in the following testimony as well as regular presentations to the OPUC Staff in advance of each of the past four general rate cases (GRCs).
- i. The 2020 Vision project has been discussed in Information Technology testimony in each of the last five GRCs (PGE Exhibit 600, UE 215; PGE Exhibit 600, UE 262; PGE Exhibit 700, UE 283; PGE Exhibit 600, UE 294; and PGE Exhibit 500, UE 319). Detail regarding benefits can be summarized as follows (see PGE Exhibit 600, UE 215, pages 24-28):
- Current technology obsolescence – Many of the systems that PGE plans to replace have been in service for many years and are either no longer supported by the vendor or will not be supported in the near future. When systems are no longer supported, upgrades and enhancements are no longer provided by the vendor to meet new requirements, patch security threats, or fix bugs. At that point, PGE would have to perform this work in-house at significant cost and risk.
For example, PGE's financial system is 26 years old, the vendor is no longer making enhancements, and we need a system that can accommodate the International Financial Reporting Standards (IFRS) that are currently expected to be required by 2012 (i.e., 2014 but with two prior years of detail). PGE can incur additional costs to upgrade these legacy systems with the new requirements but this means we would not have ongoing vendor support as the technology and user requirements continue to change.
 - Operational efficiencies through process improvement – inefficient and redundant processes will be identified and improved, thereby increasing operational efficiency. Examples of benefits include:
 - Elimination of manual processes, reduction of redundant work, improved workflow, and more efficient reconciliation. In addition, PGE expects to: 1) have a more effective capital and O&M budgeting process, 2) have enhanced ability to forecast multiple scenarios and analyze data, 3) capture PGE's financial commitments and expected cash flows automatically, and 4) strengthen our internal controls by automating current manual controls.
 - Optimization of resources across maintenance, construction, and inspection groups. Currently, resource assignments are assembled manually and dispatched by individual workgroups, limiting the ability for workforce leveling or resource optimization across the organization. A fully integrated work and asset management system, built on standard

business processes, will reduce the amount of manual reconciliation and handling required for scheduling and dispatch. In addition, it will enable PGE to compare and contrast similar work activities by crew or region.

- Improvements in customer service – Customer information can be connected to: 1) the assets associated with providing electric service (i.e., transformers, poles, wires, meters, etc), and 2) the PGE resources responsible for building, maintaining, and repairing those assets. For example, an Asset Management system that is fully integrated with GIS and Outage Management applications, in conjunction with our Smart Meters, can create a foundation for future projects to allow customers to access their service information and the status of restoration efforts in real-time.

Currently, there is no intelligent connectivity model for PGE’s distribution system and outages are determined via “roll ups” of circuit maps. This results in additional time spent diagnosing the outage, incomplete knowledge of the outage boundaries and affected customers, and less than optimal crew dispatching for restoration efforts.

- Improved asset utilization – Currently, PGE does not have the means for a consistent asset management strategy or process, across organizations and individual work groups, to determine how best to utilize our assets. Because departments independently conduct narrowly scoped work on the same assets, without a holistic view of the work required, some re-work and revisits to any given asset may occur. With up-to-date technologies and standardized processes PGE can benefit from “just in time” inventory and we will have more accurate information to identify when critical assets need replacing rather than use a time-based replacement strategy.
- Smart grid connectivity – With PGE’s current fragmented systems, smart grid data will not be available across applications and cannot be fully utilized. Consequently, PGE’s current technology will become a bottleneck to realizing future smart grid potential. By implementing the 2020 Vision program, with process improvement and standardization, PGE can use real-time, smart grid information to optimize PGE’s power delivery system (e.g., transformers and other assets) and realize more dependable and more rapid outage identification.
- Knowledge transfer – Much of PGE’s knowledge of operational practices resides within the individuals currently performing the work. Over the next five to ten years, we anticipate that a significant percentage of our IT workforce will retire. The effort required to migrate work processes from legacy applications to new systems offers a unique opportunity to address how we capture process knowledge and train new employees, so that as much as possible, our historical contexts, policies, and ways of working will not be lost in the labor transition.
- Time to complete – Because the systems will take up to seven years to fully implement and given the needs/benefits identified above, PGE believes it is inappropriate to delay the program beyond the current schedule.

- Based on the last four years of historical costs, PGE estimates that without implementing the proposed projects, the cost of maintaining and upgrading PGE's existing systems over the next five years will be approximately \$44 million. This would maintain current functionality and business processes and provide little or no additional business value, while at the same time would:
 - Leave PGE unable to respond to increasing demands for real-time information, changing customer needs, and increasing regulatory requirements;
 - Impair PGE's ability to pursue business process improvement efficiencies;
 - Require continued significant investment in IT integrations of disparate systems in an attempt to provide the seamless flow of data across applications, such as the data required for and provided by the Smart Grid;
 - Put PGE at risk of losing valuable knowledge currently embodied in long-time employees' understanding of how to work across disparate information systems;
 - Weaken PGE's ability to attract and retain new talent to replace retiring workers;
 - Inhibit PGE's ability to leverage the capabilities of Smart Grid technologies currently being implemented; and
 - Be analogous to paving cow-paths rather than investing in a modern freeway system.

- ii. Information Security provides significant benefits but primarily in the form of avoiding the increasing risk of sophisticated data breaches, data loss, or compromised operations by hackers who could exploit vulnerabilities in PGE's cyber and critical infrastructure assets. We would also face financial penalties due to non-compliance with legal and regulatory requirements. In short, PGE cannot afford to defer this work. The study used to identify the security measures and initiatives from which PGE developed its Information Security Roadmap was provided in confidential work papers to PGE Exhibit 500, UE 319 (see "Risk-based Prioritizations and Updated Security Roadmap").

- iii. Customer Engagement Transformation (CET) program became the last portion of 2020 Vision and was discussed separately in PGE Exhibit 900, UE 262; PGE Exhibit 1000, UE 283; PGE Exhibit 900, UE 294; and PGE Exhibit 900, UE 319. Benefits from CET include:
 - Provide several enhancements that are responsive to customer needs, including the ability for customers to:
 - Make one-time check payments over the phone; currently customers are redirected to the IVR system or the PGE website to make the payment.
 - Enroll in Auto Pay or update bank account information over the phone.
 - Choose the specific date their bill will be due, instead of the bill cycle (date range), helping customers better plan and manage their cash flow.

- Enroll in the Preferred Due Date program with fewer restrictions making it more accessible to customers who could benefit the most.
 - Keep their new account number permanently (when new systems are implemented), even when they move to a different address within PGE's service territory.
 - Support more varied pricing options compared to what is available with our current system.
 - Replace systems that have become technically and functionally obsolete, are not suited for emerging smart grid requirements and changing customer expectations, and must be replaced if PGE is to remain responsive to customers' needs, expectations, and preferences.
- iv. Transmission and Distribution (T&D) strategic capital improvements relate to customer-driven capital work and efforts to improve the T&D system to: 1) replace or upgrade equipment nearing the end of its life; 2) redesign portions of the system to improve reliability; and 3) better prepare for earthquakes, cyber-attacks, and other threats. This effort was guided by a third-party assessor, Black & Veatch (B&V) that PGE hired to review our T&D asset management practices and capabilities. B&V's assessment of T&D – a Publicly Available Specification 55 (PAS-55) – is provided in confidential work papers to PGE Exhibit 800, UE 319. Based on this assessment, PGE created the Strategic Asset Management department (SAM) to develop an annual T&D risk assessment and associated portfolio of recommended risk reduction projects. The objective of SAM's methodology is to consider the negative impacts of service failure on:
- System reliability;
 - Public and worker safety;
 - Environmental stewardship; and
 - Efficient expenditure of funds.

SAM identifies system improvements that demonstrate maximum value to customers in terms of risk reduction. The types of projects include:

- Asset replacement by proactively replacing infrastructure that is operating beyond its life and thus creating reliability, safety, environmental, and cost threats for customers;
- System reconfiguration by shifting loads in the system or reconfiguring system designs to better manage load and can reduce the impacts of service failures on customers should they occur; and
- Grid modernization by installing new types of advanced technologies that can help PGE increase reliability and meet new customer demand (e.g., PGE's Smart Grid initiatives).

UE 319

Attachment 558-A

Provided in Electronic Format only

FTE Data Provided in UE 319 Testimony, Exhibits, and Responses to
Data Requests

UE 319

Attachment 558-B

Provided in Electronic Format only

UE 262; PGE Exhibit 201

UE 319

Attachment 558-C

Provided in Electronic Format only

UE 283; PGE Exhibit 707