

**EXH. DRK-1T
DOCKETS UE-22 ___/UG-22 ___
2022 PSE GENERAL RATE CASE
WITNESS: DAN'L R. KOCH**

**BEFORE THE
WASHINGTON UTILITIES AND TRANSPORTATION COMMISSION**

**WASHINGTON UTILITIES AND
TRANSPORTATION COMMISSION,**

Complainant,

v.

PUGET SOUND ENERGY,

Respondent.

Docket UE-22 ___

Docket UG-22 ___

PREFILED DIRECT TESTIMONY (NONCONFIDENTIAL) OF

DAN'L R. KOCH

ON BEHALF OF PUGET SOUND ENERGY

JANUARY 31, 2022

PUGET SOUND ENERGY

**PREFILED DIRECT TESTIMONY (NONCONFIDENTIAL) OF
DAN'L R. KOCH**

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1 **PUGET SOUND ENERGY**

2 **PREFILED DIRECT TESTIMONY (NONCONFIDENTIAL) OF**
3 **DAN'L KOCH**

4 **I. INTRODUCTION**

5 **Q. Please state your name, business address, and position with Puget Sound**
6 **Energy.**

7 A. My name is Dan'l Koch, and my business address is Puget Sound Energy, P.O.
8 Box 97034, Bellevue, Washington 98009-9734. I am employed by Puget Sound
9 Energy ("PSE" or the "Company") as Vice President, Operations.

10 **Q. Have you prepared an exhibit describing your education, relevant**
11 **employment experience, and other professional qualifications?**

12 A. Yes, I have. It is Exhibit DRK-2.

13 **Q. What are your duties as Vice President, Operations, for PSE?**

14 A. As Vice President, Operations, for PSE, I am responsible for delivering customer
15 and system work including engineering and project delivery as well as electric
16 operations, vegetation management and construction management.

1 **Q. What topics are you covering in your testimony?**

2 A. My testimony provides a high-level overview of PSE's electric and natural gas
3 operations and provides a more detailed discussion of the Energize Eastside
4 transmission project.

5 First, I provide a high-level overview of how PSE invests in the ongoing
6 operations and maintenance of the electric and natural gas infrastructure in place
7 throughout PSE's service territory. This includes a description of how PSE
8 approaches its core function of providing safe, clean, and reliable gas and electric
9 services for our customers in compliance with state and federal regulations. PSE
10 focuses on four key objectives addressing safety, system integrity, growth, and
11 operational excellence.

12 Next, I explain the methodical approach PSE uses to prioritize natural gas and
13 electric transmission and distribution projects so that PSE's investments provide
14 the greatest benefit to customers today and into the future. This includes PSE's
15 approach to system modernization of both its gas and electric systems. PSE's
16 operations strategies are designed to meet evolving customer expectations, federal
17 and state standards, and Washington State policy goals that include environmental
18 stewardship, economic development, and equitable allocation of the benefits of
19 advanced technologies to all PSE customers.

20 Third, my testimony addresses the Energize Eastside transmission project for
21 which PSE seeks recovery in this multiyear rate plan. I provide an overview of

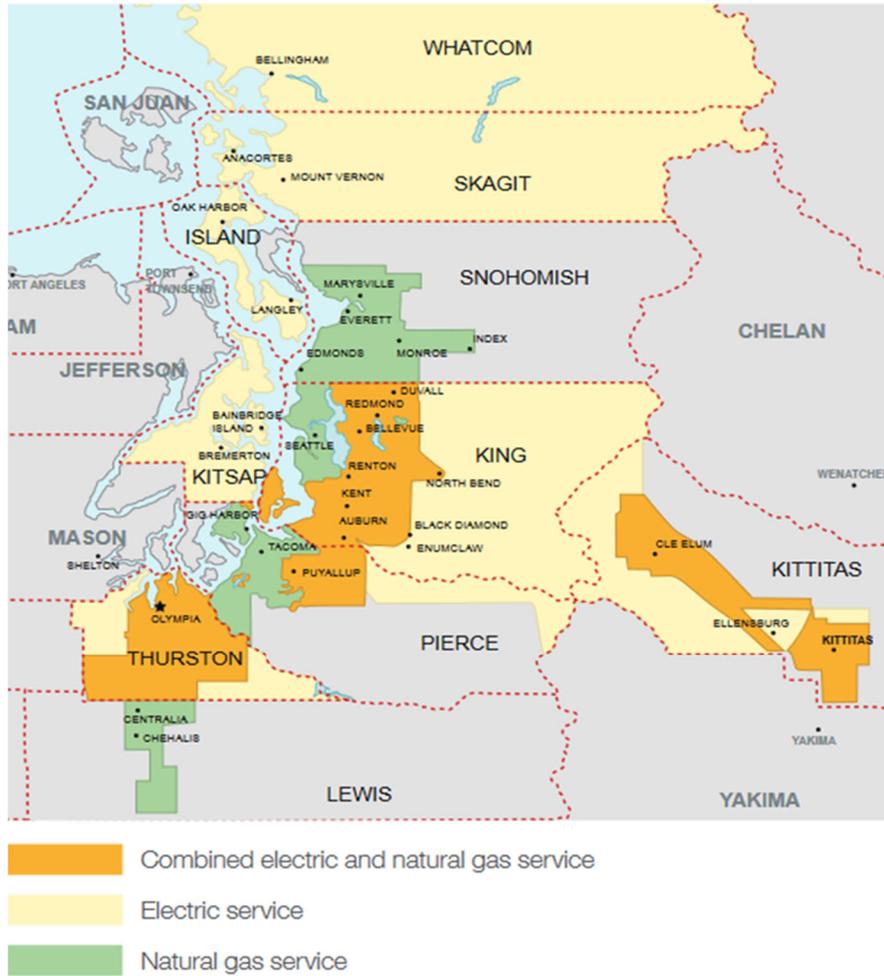
1 this important transmission project that addresses a transmission capacity deficit
2 on the Eastside. I address the significant processes PSE has undertaken to study
3 the need for the project and evaluate alternatives to meet the need. I discuss how
4 PSE has communicated with customers and the community about the need for the
5 Energize Eastside project and how PSE has used customer feedback to improve
6 the project. I address the project's operations, costs, and scope and discuss the
7 plant that will serve customers during the rate plan period. Finally, I address the
8 substantial benefits that the Energize Eastside project provides to PSE's
9 customers, including reliability enhancements and facilitation of PSE's clean
10 energy goals.

11 **Q. Please describe the PSE natural gas and electric service territories and**
12 **customers.**

13 A. PSE provides service to over 850,000 natural gas and approximately 1.2 million
14 electric customers in partially overlapping service territories that total
15 approximately 6,000 square miles in the Puget Sound region of Western
16 Washington. PSE's service territory is illustrated in Figure 1, below.

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Figure 1: PSE Service Territories



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Q. Please describe the PSE natural gas and electric energy delivery systems.

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A. PSE’s delivery systems are designed to meet peak demand on those coldest of winter mornings as well as a growing peak demand during the summer months where electric system capacity is reduced. Over time, PSE has experienced increases in peak load demand. PSE’s recent peak electric load was 5,039 megawatts (“MW”) and peak hourly gas load was 1,581,160 therms. PSE also

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1 experienced its highest summer peak electric load on record of 4,336 MW in June
2 2021.

3 PSE delivers this peak natural gas load through approximately 26,000 miles of
4 pipeline system (mains and services) supported by 553 pressure regulating
5 stations and integrating 17,263,362 therms of renewable natural gas. On cold
6 mornings, PSE augments its natural gas delivery with compressed and liquefied
7 natural gas and manually adjusts valves and set points to optimize pipeline
8 operations. Some of PSE's gas infrastructure currently in service is over 50 years
9 old; it is managed and maximized through robust continuing surveillance
10 processes and risk management requirements and technics. Demand is forecasted
11 to continue to increase, however at a much slower rate than historically.

12 PSE delivers this peak electricity across 26,438 miles of transmission and
13 distribution system supported by 353 transmission and distribution substations.
14 The electric grid integrates electric resources through approximately 12,000 net
15 metered solar customers and will support 102 MW of distributed energy resources
16 ("DER") through the multiyear rate plan by proactive modernization and non-wire
17 alternatives that enable a cleaner energy supply. Some of PSE's electric
18 infrastructure currently in service is over 80 years old; PSE maximizes and

1 leverages assets beyond their expected life cycles as a result of focused
2 maintenance practices. Demand is forecasted to continue to increase.¹

3 **Q. Please describe the organization of the Operations function within PSE and**
4 **the number of PSE employees working in Operations.**

5 A. PSE employs approximately 1,100 employees in its Operations function and
6 augments field crews through seven service provider contracts to perform
7 construction, maintenance, and operations of PSE’s electric and gas delivery
8 system. The work these employees and contractors perform includes planning the
9 system and addressing new and modified customer service requests, engineering
10 and constructing improvements, monitoring real time operations, and responding
11 to equipment and vegetation maintenance issues and emergencies. This work
12 includes capital investments—adding new assets or replacing assets—and
13 expenses focused on operations and maintenance of assets.

14 **Q. Is PSE proposing to increase the level of spending for the Operations**
15 **function over the course of PSE’s proposed rate plan?**

16 A. Yes. PSE’s past level of spending on Operations functions, which has been
17 challenged most recently by events like COVID-19 and related financial
18 constraints, will not allow PSE to deliver on key objectives of customers and
19 regulatory interests such as reliable clean energy. In fact, the electric delivery

¹ See *In the Matter of Puget Sound Energy’s Draft 2021 Electric Integrated Resource Plan*, Docket UE - 200304, 2021 Final Integrated Resource Plan (Apr. 1, 2021).

1 performance trend is likely not to improve until the final year of the rate plan due
2 to the tight financial constraints that have been in place, as discussed in more
3 detail in the Prefiled Direct Testimony of Kazi K. Hasan, Exh. KKH-1CT.

4 Increased integration of distributed energy resources and energy use associated
5 with electric vehicles as well as modernization of pipeline operations will require
6 more investment in some key areas over the course of the multiyear rate plan.

7 Performance measures set as part of the rate plan must be consistent with the
8 allowed recovery for historical and forward-looking investments. More detail
9 regarding the investment that we are requesting to meet performance measures
10 and expectations is described in the Prefiled Direct Testimony of Catherine A.

11 Koch, Exh. CAK-1T. It will be important to have flexibility in Operations plans
12 and spending in order to adapt and achieve the outcomes set forth in the
13 performance measures and evolving expectations, and to address events outside
14 PSE's control including pace of customer adoption of new technology and
15 programs (e.g., distributed energy resources, demand response), inflation, and
16 other circumstances outside of PSE's control.

17 **Q. What can customers expect as a result of the programs the Operations**
18 **function will support over the term of PSE's proposed rate plan?**

19 A. PSE customers should expect that PSE will make prudent decisions using robust
20 processes and expending available funds in a practical way to bring maximum
21 benefits all the while strengthening the infrastructure used to provide safe,
22 reliable, and resilient power and gas service. Customers can also expect PSE to

1 make sound investments in the systems that will meet customers' changing needs
2 as new technologies and services continue to evolve and become available. An
3 example is PSE's implementation of Advanced Distribution Management System
4 to enable distributed energy resources and Volt/VAR optimization.

5 **Q. Do other witnesses in this case address the Operational investment needs?**

6 A. Yes. The testimony of Catherine A. Koch, Exh. CAK-1T, describes the process of
7 determining customer and operational needs that drive infrastructure
8 improvements and how solutions are decided. Her testimony also describes the
9 programmatic plan to deliver the key objectives that I describe, including more
10 details regarding performance challenges and how the multiyear rate plan will
11 deliver improvements needed to support the evolving operations of the electric
12 and gas delivery system. The Prefiled Direct Testimony of Roque B. Bamba, Exh.
13 RBB-1T, explains how programs and projects are implemented and the control
14 practices employed from initiation to project close-out.

15 **II. PSE CONTINUES TO FOCUS ON PROVIDING SAFE, CLEAN, AND**
16 **RELIABLE SERVICE FOR ITS CUSTOMERS**

17 **A. Overview of PSE's Operations Philosophy and Key Objectives**

18 **Q. Please provide an overview of PSE's operations philosophy.**

19 A. PSE is dedicated to delivering safe, clean, and reliable energy to its customers. To
20 meet these goals, PSE is focused on five primary objectives from an operations
21 perspective: (1) prioritize customer and public safety, (2) provide excellent energy

1 delivery service to PSE’s customers and communities, (3) pursue enhancements
 2 to reliability and resilience by making investments that modernize the grid to meet
 3 current and emerging needs, (4) pursue enhancement that allow for alternative
 4 fuels while maintaining pipeline safety and reliability, and (5) pursue operational
 5 excellence by establishing a continuous improvement mindset among all PSE
 6 Operations professionals. These pillars of PSE’s approach to utility operations are
 7 addressed in greater detail in the balance of my testimony and in the testimony of
 8 Catherine A. Koch, Exh. CAK-1T.

9 **Q. How will PSE’s focus on these priorities serve the interests of customers?**

10 A. Achieving these objectives will yield material benefits to customers. The table
 11 below provides examples of these benefits for each operational priority.

12 **Table 1. PSE Operations Objectives and Customer Interests**

Objective	Customer Interests
Customer and public safety	<ul style="list-style-type: none"> • Infrastructure is safe for the public and those who work around it. • Customers and the public have the information they need to stay safe around natural gas and electricity. • Robust preparedness and response by PSE when an emergency occurs.
Customer growth and service needs	<ul style="list-style-type: none"> • Provide gas and electric energy services to new and existing customers under normal and peak conditions according to tariffs and service quality expectations.
Grid modernization	<ul style="list-style-type: none"> • Infrastructure is actively monitored, maintained, and managed to reliably perform as designed and in compliance with codes and standards. • Implement modern grid capabilities to improve system reliability, resiliency, flexibility, and efficiency. • Infrastructure enables PSE to meet CETA through modern tools and integration of DERs.

Objective	Customer Interests
Pipeline modernization	<ul style="list-style-type: none"> • Infrastructure is actively monitored, maintained, and managed to reliably perform as designed and in compliance with codes and standards. • Implement modern materials that enable clean fuel alternatives.
Operational excellence	<ul style="list-style-type: none"> • Continuously improve and deploy best practices to operate efficiently and reduce costs. • Provide service in a timely manner. • Use cost effective technology, clean alternatives, and methods to save energy.

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Q. How do recent events in the gas and electric industry reinforce the importance of PSE’s objectives?

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A. Recent extreme weather events—such as the February 2021 winter storms affecting Texas north to Minnesota, and the extreme heat and heat dome affecting the Pacific Northwest in the summer of 2020 and 2021—underscore the importance of maintaining the safe and reliable operations of the natural gas and electric systems, as well as the importance of adequate resource planning. Similarly, the increasing prevalence of wildfires reinforces the need for vigilance when addressing electric system safety, reliability, and resiliency.

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The recent physical and cyber threats to the Colonial Pipeline and other critical national infrastructure highlight the need to relentlessly monitor and protect against damage to PSE’s natural gas and electric system. Additionally, the Merrimack Valley explosions in 2018 demonstrates the importance of a robust gas distribution integrity management program. These events highlight the

1 importance of maintaining safe and reliable systems while transitioning to cleaner
2 energy sources.

3 **Q. What new challenges is PSE facing with respect to its Operations work?**

4 A. Three noteworthy and new challenges that PSE has had to address—and is still
5 facing—are (1) the effect of the COVID-19 pandemic on PSE’s gas and electric
6 operations, (2) the increasing threats of wildfires in PSE’s service territory, and
7 (3) extreme heat events that cause extraordinary demand for energy. These events
8 have created significant and novel operating challenges, including challenges
9 related to workforce health and safety that arise during these events, as well as
10 infrastructure limitations. These challenges reinforce the need for flexibility in
11 plans to adapt effectively, meet customer needs, and leverage new assets such as
12 recent investments in AMI.

13 **Q. Please discuss the challenges that COVID-19 presents.**

14 A. PSE witness Kazi Hasan describes the financial challenges that COVID-19 has
15 brought, and the Prefiled Direct Testimony of Carol L. Wallace, Exh. CLW-1T,
16 discusses PSE’s work to support the community through CACAP funds and other
17 initiatives, in which PSE has been a leader.

18 From an operational standpoint, PSE faced the challenges of converting to a
19 predominately remote work force since March 2020. This brought new
20 opportunities to advance processes such as greater use of IT systems to

1 communicate with colleagues and external partners. However, PSE also
2 immediately felt constraints on the ability to complete construction and
3 maintenance activities in order to maintain a safe work environment as well as
4 restrictions set by jurisdictions, contractors, and customers.

5 PSE has continued to adapt to changing safety guidelines and vaccine
6 requirements. The economic impacts from COVID-19 that have impacted
7 customers have subsequently created uncertainty in projected investments needed
8 to support customer requests, which have been more variable than historically.
9 Abnormal traffic flows have affected PSE's response capabilities for outage and
10 emergency response. Data suggests an increase in accidents even during COVID-
11 19 "stay at home" periods, which created challenges for PSE emergency
12 personnel traveling to outage and emergency locations.

13 Nevertheless, PSE's operations have been adaptive and responsive throughout the
14 pandemic. I am proud of PSE's strong, community-focused service, and
15 customer-committed Operations workforce. As we move forward, the
16 uncertainties that COVID-19 has created will continue to impact operational work
17 and our ability to rely on historical data to predict future investment and
18 operational processes. This means that we must continue to be flexible and
19 adaptive to new conditions.

1 **Q. Please discuss the threat of wildfires that PSE faces.**

2 A. Wildfires are a rising threat to PSE and the communities we serve as the climate
3 changes. In early 2019 PSE began making plans to address the emerging threat of
4 wildfires that have plagued California and the West Coast. Historically, wildfire
5 risk for PSE had been limited to central Washington in PSE's service territory.
6 The Labor Day fires of 2020 revealed the increasing risk and the potential for
7 fires west of the mountains.² PSE's initial Wildfire Mitigation and Response Plan,
8 filed with the Commission July 2021, is focused on enhancing situation
9 awareness, fault reduction and protection, operational procedures and emergency
10 response, and communication and outreach with customers and communities.³
11 Wildfires present an evolving operational risk for which PSE will monitor and
12 adapt as necessary to maintain safe and reliable gas and electric service. The need
13 to address changing circumstances may require modification to PSE's investment
14 plans over the course of the rate plan period.

15 **Q. Please discuss the challenges that extreme heat events present.**

16 A. During the extreme heat events that took place in 2020 and 2021, PSE
17 experienced a multitude of heat related outages caused by stress to trees that
18 failed and impacted overhead lines, equipment at or above its normal operating

² Q13 Fox, *Evacuations ordered in parts of Pierce, Thurston counties as wildfires destroy homes* (Sept. 8, 2020), available at <https://www.q13fox.com/news/evacuations-ordered-in-parts-of-pierce-thurston-counties-as-wildfires-destroy-homes>.

³ PSE has participated in two open meetings to discuss wildfire risk and mitigation efforts and provided a Wildfire Mitigation Plan. See *In the Matter of Utility Wildfire Preparedness*, Docket U-210254, PSE's 2021 Wildfire Mitigation Plan (July 2, 2021).

1 limits (temperature and load), and sagging lines that contacted vegetation. PSE
2 also experienced a high number of service transformer failures resulting in
3 unplanned repair and replacement work that put additional strain on operations
4 field personnel who were unable to sustain a high cadence of activity due to the
5 extreme conditions but worked safely to restore power to customers as quickly as
6 possible. Overall, PSE's system performed well under the extreme conditions, and
7 PSE did not need to intentionally shed load to preserve equipment or avoid
8 cascading failures. However, an understanding of service transformer loading and
9 peak demand obtainable from AMI will allow for greater resiliency for similar
10 events in the future.

11 **Q. Are there other challenges PSE faces from an operational perspective that**
12 **make flexibility important in the multiyear rate plan?**

13 A. PSE plans for events that can be reasonably predicted. However, unexpected
14 conditions do arise periodically. In some instances, cost increases may result from
15 changes in plans or timing. These costs tend to involve unexpected municipal
16 permitting requirements, easement acquisition charges, rights-of-way fees,
17 franchise fees, and other expenses such as general delay impacts.

18 As PSE implements the Clean Energy Implementation Plan ("CEIP") and deploys
19 demand side management, distributed energy resources, and other conservation
20 efforts, it will require responsive performance when and where such programs are
21 deployed. Load growth projections may vary as a result, and current forecasts

1 suggest an increasing electric summer peak. These dynamic and uncertain energy
2 demands and price-responsive behavior will require flexibility in deploying
3 investments in thoughtful and adaptive ways.

4 **Q. Please explain how PSE identifies and quantifies the level of spend required**
5 **to operate, maintain, and expand the electric and natural gas system.**

6 A. PSE's 2021 Integrated Resource Plan ("IRP") forms a foundation for load and
7 resources from which PSE builds plans and quantifies needs. The IRP forecasts
8 energy resources needed to meet overall system demand. Since CETA and the
9 IRP determines that some of these resources will need to be distributed energy
10 resources, these resources will also be leveraged to offset some distribution
11 infrastructure investments based on the resulting localized load flow. However, as
12 previously discussed, PSE's spending must be flexible and able to adapt to
13 address new, emerging, and evolving challenges and priorities as well as customer
14 choice. In order to remain flexible and pivot when needed, PSE manages planned
15 and unplanned work categorized as discretionary and non-discretionary. For
16 discretionary activities, PSE has flexibility regarding scope, schedule, and budget.
17 PSE can evaluate risks and tradeoffs as part of the Company's business planning
18 and annual budgeting process. Non-discretionary activities are generally dictated
19 by others or requirements relative to timing and or scope. PSE's annual budget
20 process aims to provide sufficient resources and dollars to manage non-
21 discretionary activities in accordance with good utility practice. Non-discretionary
22 work takes priority over discretionary work.

1 The core services work is generally non-discretionary in nature, meaning
2 investment level will need to adapt to outside demands, and responsiveness is a
3 priority. For example, it is required that PSE complete public improvement
4 projects as obligated, provide for public and customer safety, and address
5 customer growth. Additionally, some grid modernization and most pipeline safety
6 enhancements respond to federal and state requirements for the safety and
7 integrity of the bulk electric system and the gas delivery system. Over 36 percent
8 of PSE's operations work is non-discretionary and subsequently quantified
9 through historical trends, load forecasts, and known requirements. PSE witness
10 Catherine A. Koch further discusses the planned and unplanned, discretionary,
11 and non-discretionary work.

12 **Q. How does PSE determine what discretionary work should be performed?**

13 A. The discretionary work follows a robust planning process. PSE's System Planning
14 department is responsible for evaluating system demands and performance and
15 identifying and scoping system projects that deliver safe and reliable service and
16 meet regulatory requirements, good utility practice, and customer needs. The
17 process begins with an analysis of current performance, existing operational
18 challenges, known commitments, and anticipated future need. Planning
19 considerations (inputs) include both internal and external factors, such as
20 customer needs and load growth forecasts (peak, localized, known projects, and
21 overall system growth), reliability performance, aging infrastructure, integration
22 of resources, and timing of municipal sponsored projects. Projects are scored

1 against each other to assess the prioritization of system and customer needs. An
2 analysis is conducted to identify alternatives that will address the operational
3 challenge. Benefits and costs are then forecasted for each alternative. Planners
4 select and plan for the alternative that best balances customer needs, system
5 performance, regulatory compliance, PSE economic parameters, and local and
6 regional plans.

7 **Q. Please elaborate on how PSE prioritizes this work.**

8 A. PSE uses a project portfolio optimization and value-base decision analysis tool
9 called the Investment Decision Optimization Tool (“iDOT”). iDOT allows PSE to
10 compare the relative costs and benefits of various solutions across multiple factors
11 including reliability, safety, current and deferred future costs, capacity addition,
12 and external stakeholder inputs. Total value is optimized across the entire
13 portfolio of delivery system infrastructure projects (electric and gas) against
14 financial constraint scenarios, which results in a set of capital projects that
15 provide maximum value to PSE customers and stakeholders. iDOT allows a side-
16 by-side comparison of projects and programs of different types as further
17 described by PSE witness Catherine A. Koch. PSE’s delivery system work is then
18 prioritized alongside other necessary investments on a company-wide basis, as
19 further discussed in the Prefiled Direct Testimony of Joshua A. Kensok, Exh.
20 JAK-1T.

1 **Q. Is PSE’s pace of spending for electric and natural gas operations necessary**
2 **and reasonable?**

3 A. Yes. The spending for which PSE seeks recovery for electric and natural gas
4 operations, since the test year in the 2019 general rate case and throughout the
5 multiyear rate plan, is reasonable and necessary to meet PSE’s existing service
6 quality indices (“SQI”), to provide safe and reliable service to meet the evolving
7 and increasingly sophisticated customer needs, and to comply with emerging
8 federal and state requirements. PSE will need to increase spending at a level that
9 allows it to maintain and improve reliability and to comply with state and federal
10 regulations and policies.

11 **Q. Why is the level of spending for the Operations function necessary and**
12 **reasonable?**

13 A. PSE has forecasted the investment needed to perform core services and other non-
14 discretionary work, such as mandated public improvement projects, public and
15 customer safety, customer growth, pipeline safety requirements, and
16 enhancements in response to federal and state requirements for the safety and
17 integrity of the bulk electric system and the gas delivery system.

18 In addition, PSE must continue to invest in replacing obsolete systems with new
19 technology, such as its advanced metering infrastructure (“AMI”) and Advanced
20 Distribution Management System (“ADMS”). This will allow the Company to
21 cost-effectively provide existing services and to support innovative programs

1 involving advanced technologies, including demand response and distributed
2 energy resources. The capital spending reflects an increase of over 32 percent as
3 compared to the historical spend to maintain safe infrastructure and introduce new
4 technologies to make existing and new systems efficient. More information
5 regarding the need for existing system replacements and new technologies is
6 provided later in my testimony and by PSE witness Catherine A. Koch.

7 The non-discretionary investments will take priority and, as a result, work plan
8 adjustments may be necessary to discretionary work, to remain within PSE's
9 financial constraints. PSE witness Kazi K. Hasan discuss the balancing of
10 delivering operational benefits within financial constraints.

11 **B. PSE Prioritizes Customer and Public Safety First**

12 **Q. Please elaborate on PSE's top priority of customer and public safety.**

13 A. PSE's top priority is, and will remain, the safe operation of its gas and electric
14 systems. Safety is designed into all our work, from prioritizing safety in delivery
15 system planning processes and decisions, to design and construction standards
16 that embed safety margins to keep workers and the public safe.

17 **Q. How does PSE respond to gas and electric emergency situations in the**
18 **communities it serves?**

19 A. PSE maintains a robust 24-hour response to gas and electric emergencies that are
20 reported by customers and the public or observed through PSE monitoring. PSE

1 has maintained a response time of 30 minutes or less for natural gas emergencies,
2 which is well within the SQI threshold of 55 minutes.⁴ PSE also trains fire
3 fighters who respond to fires and gas leaks.

4 PSE also continues to be highly responsive to power outages and electric system
5 emergencies and strives to maintain an average response time for electric service
6 incidents of 55 minutes. PSE's ability to meet this SQI has been challenged due to
7 COVID-19, increasing number of outages, and competitive pressure for field
8 resources. PSE did not meet this SQI threshold⁵ in 2021.

9 For major storms and other natural disasters, PSE places an additional emphasis
10 on safety and service. PSE continues to maintain a comprehensive and robust
11 modified Incident Command Structure that scales to the magnitude and specific
12 nature of each emergency. Every year, PSE trains employees on their emergency
13 response role and practices emergency response procedures through mock
14 emergency exercises. Additionally, PSE participates in, and is continuously
15 improving and adopting best practices in, emergency preparation and response.
16 For example, as a result of the first case of COVID in the United States being in
17 PSE's service territory, PSE led the nation in developing emergency response
18 procedures and contingency plans to provide for the continued safe operation of
19 the grid during the pandemic. PSE participated with the Edison Electric Institute
20 ("EEI") to share experiences and formalize best practices. In addition, PSE's

⁴ SQI No. 7.

⁵ SQI No. 11.

1 wildfire plan, also informed by best practices, highlights PSE’s continuous
2 scanning of increasing safety risks and actions to mitigate and prevent events
3 from impacting the communities in which PSE operates. Finally, PSE has access
4 to electric and gas emergency personnel, through participation in mutual
5 assistance programs from other companies as well as contractors should the need
6 arise. Mutual assistance and the use of contract resources allows PSE to
7 temporarily—and cost-effectively— scale its resources during an emergency
8 event.

9 **Q. What additional steps does PSE take to promote safety for its customers and**
10 **the public?**

11 A. PSE builds natural gas safety awareness throughout its customer base and with the
12 public by distributing safety information regarding natural gas leaks and odors,
13 distributing safety fliers to new gas customers, and informing the public about
14 sewer cross bore risks. PSE has increased safety awareness regarding other
15 emergencies such as being prepared with an emergency plan and kit for
16 earthquakes, floods, and storms as well as generator safety tips during power
17 outages.

18 PSE focuses on protecting infrastructure from damage. Working safely around
19 natural gas pipelines and underground electrical equipment is critically important.
20 PSE actively promotes the state’s “Call 811 Before You Dig” service and

1 provides the construction industry with resources through damage prevention
2 representatives.

3 PSE also responds to required relocation of its assets that are in conflict with
4 municipal transportation improvement projects so that construction can occur
5 safely. There are both benefits and costs associated with PSE infrastructure
6 occupying public rights of way. Such projects provide significant benefit to the
7 general public. Relocation of PSE facilities, when they are in conflict with
8 municipal projects, are primarily for safety and secondarily for accommodating
9 civil design requirements, particularly when PSE is required to relocate
10 underground facilities.

11 **Q. What additional challenges does PSE face in planning for the future with**
12 **respect to its customer and public safety work?**

13 A. Customer and public safety will always be the top priority, even though the
14 specific risks may change. As discussed, relative to COVID-19, the way people
15 get work done has changed and will likely become more permanent. In office
16 personnel work from home, changing the dynamics of communication and
17 training. Field crews must respond differently during customer interactions and
18 indoor services to maintain safety protocols. Changing traffic patterns impact
19 responding to an emergency, and changes to who may be impacted by an
20 emergency or an evacuation are examples of how the safety and risk have recently
21 changed.

1 An increased focus on environmental safety with respect to limiting methane
2 release will challenge PSE's response to gas emergencies, as state and federal
3 regulations are stretching field crews across more priorities.

4 Greater focus and investment on transportation infrastructure at the federal, state,
5 county, and local levels will increase the required relocation work that PSE is
6 obligated to perform. PSE may need to respond differently and more quickly than
7 historically to avoid an increase in third party damages.

8 **C. PSE Meets Its Obligations To Serve New Customers and Communities**

9 **Q. Please elaborate on PSE's objective to provide excellent energy delivery**
10 **service to its customers and communities.**

11 A. Per WAC 480-100-148, PSE has an obligation to make electric service available.
12 PSE added 37,173 new electric customers and averaged 1.3 percent electric
13 customer growth per year from January 2019 through June 2021. Gas service is
14 primarily driven by a customer's desire for gas due to its lower rates or quality of
15 cooking and heating performance. Customers that request gas service and meet
16 the natural gas tariff requirements are served, resulting in the addition of 21,340
17 new gas customers, an average of 1.1 percent customer growth per year from
18 January 2019 through June 2021.

1 **Q. What additional challenges does PSE face in planning for the future with**
2 **respect to its customer service work?**

3 A. With respect to customer service requests, factors such as economic strength,
4 building and energy efficiency codes, and appliance technology maturity as well
5 as any local policies or incentives that drive towards electrification will reshape
6 the historic trends. The patchwork of climate agendas across the 135
7 municipalities in which PSE serves customers will require increased engagement
8 and ongoing adaptation. Investments that respond to customers' requests may be
9 impacted by the number, type, and timing of new requests.

10 **Q. How does PSE address capacity constraints that develop due to strong**
11 **localized growth driven by many new customers or added load over time?**

12 A. In areas of strong localized growth such as Carnation's growth in gas customers,
13 Redmond's electric load growth due to the light rail, and overall growth on the
14 Eastside, as discussed later in my testimony, PSE develops infrastructure projects
15 that are timed to address projected constraints on its system. However, sometimes
16 this follows years of deploying interim operating procedures such as injection of
17 localized compressed natural gas, or utilizing corrective action plans ("CAPs"),
18 which might include radializing the grid, or in some instances having load
19 shedding plans, until the investment in infrastructure catches up with the need.
20 These interim operating procedures are intended to be short term solutions, and

1 PSE strives to plan and construct the necessary infrastructure to operate a safe and
2 reliable gas and electric systems without the need to take interim actions.

3 **Q. Has PSE’s work to meet its obligation to serve customers been effective?**

4 A. Yes. PSE sends surveys following completion of customer requested work
5 relating to serving new customers. Over the last three years, these surveys
6 measured an overall satisfaction at 8.6 on a scale of 10. On average, PSE also
7 achieved 99.8 percent on its metric measuring the percent of gas and electric
8 construction jobs completed in three weeks or less since 2018. Additionally, PSE
9 achieved a 96 percent customer satisfaction score on gas field service (SQI No. 8)
10 in 2021, which exceeded the benchmark of 90 percent, and PSE achieved a 99
11 percent score on customer appointments met (SQI No. 10) in 2021, which
12 exceeded the benchmark of 92 percent.

13 **D. PSE Is Focused on Serving Reliable Energy in a More Distributed Resilient**
14 **Way**

15 **Q. What steps is PSE taking to meet its objective to enhance reliability and**
16 **resilience by making investments that modernize the grid?**

17 A. Clean energy driven by CETA as well as customer desires mean more distributed
18 energy resources will connect to the grid over the next ten years. It is critically
19 important that PSE enhance the reliability and resiliency of the grid to support
20 these investments. PSE is transforming the grid to reliably enable greater demand
21 side management and DERs to meet CETA requirements and as described in

1 PSE’s 2021 IRP and CEIP. For a more detailed discussion refer to the Prefiled
2 Direct Testimony of Catherine A. Koch, Exh. CAK-1T.

3 **Q. Has PSE been working to modernize the grid prior to the passage of CETA?**

4 A. Yes. PSE has been actively preparing for clean energy pursuits and DERs for
5 many years. Dating as far back as 2010, WAC 480-100-505 focused on electric
6 utilities’ preparation and progress towards a “smart grid” that enabled many
7 elements outlined in the CEIP. Since 2010, there are additional policies that
8 highlight the future that has now been cemented by CETA including the
9 Commission’s Report and Policy Statement on Treatment of Energy Storage
10 Technologies in Integrated Resource Planning and Resource Acquisition.⁶ This
11 policy statement encouraged greater energy storage alternatives in planning
12 processes, in itself suggesting a future grid that embraces this technology. These
13 “tea leaves” were not difficult to read, and PSE has been developing and
14 advancing a modernized grid, as well as planning for and investing in
15 infrastructure that ultimately supports clean energy goals.

16 **Q. How does PSE’s CEIP build on these earlier efforts?**

17 A. PSE’s CEIP describes the next steps on that journey, reflecting that a modern grid
18 enables clean energy to be reliable and resilient. PSE’s CEIP provides insight into
19 what aspects of grid modernization must be accelerated to keep pace with

⁶ Docket U-161024.

1 customer desired programs and the rate of customer adoption of these
2 technologies.

3 **Q. What are some of the elements outlined in the CEIP that require a more**
4 **modern grid?**

5 A. There are numerous elements outlined in the CEIP that require a more modern
6 grid. These include the advancement of digital information relating to electricity
7 use, costs, prices, time of use, nature of use, and storage and delivery signals to
8 allow end use load device automation, controlling and managing electricity
9 demand, congestion management, voltage control, operating reserves, and
10 frequency regulation. The CEIP sought progress in the grid's ability to sense local
11 disruptions or changes in power flow. It also sought to allow customers to interact
12 with the grid like never before by using two-way communication to enable
13 different customer contracts or programs, such as time varying rates, or demand
14 response programs; to manage new end-use services to reduce operating or power
15 costs, improve reliability, or improve energy efficiency, such as charging electric
16 vehicles. Lastly, it sought to use real-time measurement of power generated from
17 customer-owned power facilities; and to use digital information to improve the
18 reliability or efficiency of generating equipment in an integrated manner to
19 improve flexibility, functionality, interoperability, cyber-security, situational
20 awareness, and operational efficiency of the transmission and distribution system.

1 **Q. Please describe PSE's approach to modernizing the grid.**

2 A. PSE's programmatic approach for modernizing the grid recognizes that
3 investments bring multiple values. To further this point, the work of the CEIP,
4 and specifically the development of the customer benefit indicator metrics,
5 highlights that clean energy needs to consider energy security and resiliency. This
6 process reemphasized stakeholders' value of decreasing the frequency and
7 duration of outages and access to emergency power. PSE's investments help
8 minimize damage from extreme weather or other natural events and align with
9 customers' expectations and needs. These investments are consistent with the
10 increased national, state, and industry focus on electric grid reliability and
11 resiliency. PSE's focus on distribution automation, for example, to restore power
12 from an adjacent circuit through automation, and its focus on improving reliability
13 for critical services increases community resiliency at a reasonable cost for our
14 customers.

15 PSE has over 30 programs that collectively create a community centered reliable
16 system. PSE's strategy includes:

- 17 • increasing visibility, analysis, and control of the system, leveraging
18 foundational technologies to advance clean energy and improve
19 system performance including completion of the deployment of
20 foundational technologies such as AMI and ADMS;
- 21 • sustained infrastructure improvement programs focused on
22 reducing and eliminating power outages for customers, including
23 increased community resilience during extreme events, and
24 continued focus on vegetation management;

- 1 • a focus on physical and cyber security as grid operations move
2 from one-way to two-way energy flow and delivery;
- 3 • enabling infrastructure to support the growing prevalence of
4 electric vehicles and integration of distributed energy resources
5 throughout our service territory; and
- 6 • unwavering diligence in meeting North American Electric
7 Reliability Corporation (“NERC”) reliability standards, which are
8 a necessary expectation for complying with CETA.

9 PSE’s processes embed these values and integrate emerging priorities such as
10 equity, beginning with its needs assessments and continuing through execution
11 processes. These programs are discussed further in the Prefiled Direct Testimony
12 of Catherine A. Koch, Exh. CAK-1T and the Prefiled Direct Testimony of
13 Suzanne L. Tamayo, Exh. SLT-1T.

14 **Q. Are there other requirements that drive PSE’s reliability efforts?**

15 A. Yes. PSE must meet NERC Reliability Standards, which require plans and
16 infrastructure that maintain the reliability of the Bulk Electric System (i.e.,
17 transmission systems operated at voltages of 100 kilovolts (“kV”) or higher). The
18 NERC standards require plans that prevent widespread cascading outages in the
19 Bulk Electric System under contingency conditions. These standards drive the
20 impact analysis of near- and long-term system performance and resource
21 allocation for demand growth. They also inform timely implementation of needed
22 infrastructure improvements. PSE’s compliance with NERC standards contributes
23 to the reliability of PSE’s system and avoids harm to the region’s interconnected
24 transmission system.

1 **Q. How has PSE integrated future-looking approaches into the rate plan?**

2 A. PSE’s plans have considered some of these challenges, and opportunities, as
3 discussed by PSE witness Catherine A. Koch, but it is important to recognize the
4 need to monitor and adjust as the Company moves through the rate plan effective
5 years. How PSE plans, operates, and constructs will need to adapt, as it always
6 has, to deliver benefits to customers. The industry and the state are in a time of
7 significant change, and processes that provide for flexibility and adaptability to
8 meet and address these changes will be a necessary component of the future.

9 To address evolving customer needs and requirements, PSE will continue to learn
10 through piloting new technologies. One example is “fusesavers”, a technology
11 that has proven effective to improve reliability and, where possible, avoid early
12 failure of equipment. Another example is a small hydrogen blending
13 demonstration in PSE’s gas training yard that PSE is using to begin understanding
14 operational questions and possibilities to decarbonize natural gas by blending
15 hydrogen as a component of the fuel in the future. Both of these are discussed by
16 PSE witness Catherine A. Koch. PSE is balancing opportunities for learning,
17 while not getting ahead of external rules and policies, knowing the expectations
18 for adoption and action will be high when these new requirements are cemented.

1 **Q. Has PSE’s work proved to be effective in delivering a more reliable and**
2 **resilient grid?**

3 A. Yes, PSE’s work has improved reliability, although the progress made can be
4 masked by events outside PSE’s control. For example, PSE’s 2020 Service
5 Quality and Reliability Report⁷ demonstrates that PSE’s programs improve
6 reliability to customers. PSE performs a reliability verification analysis to
7 determine whether projects provided the predicted benefit. A “back-casting”
8 review of a sampling of projects within a subset of the programs that were
9 completed in 2016 was performed. For each program the percentage of actual
10 performance compared to predicted performance is reported for SAIDI and SAIFI
11 ⁸and almost all programs achieved 100 percent of intended benefits. This means
12 customers on these circuits experienced better reliability as a result of PSE’s
13 programmatic work.

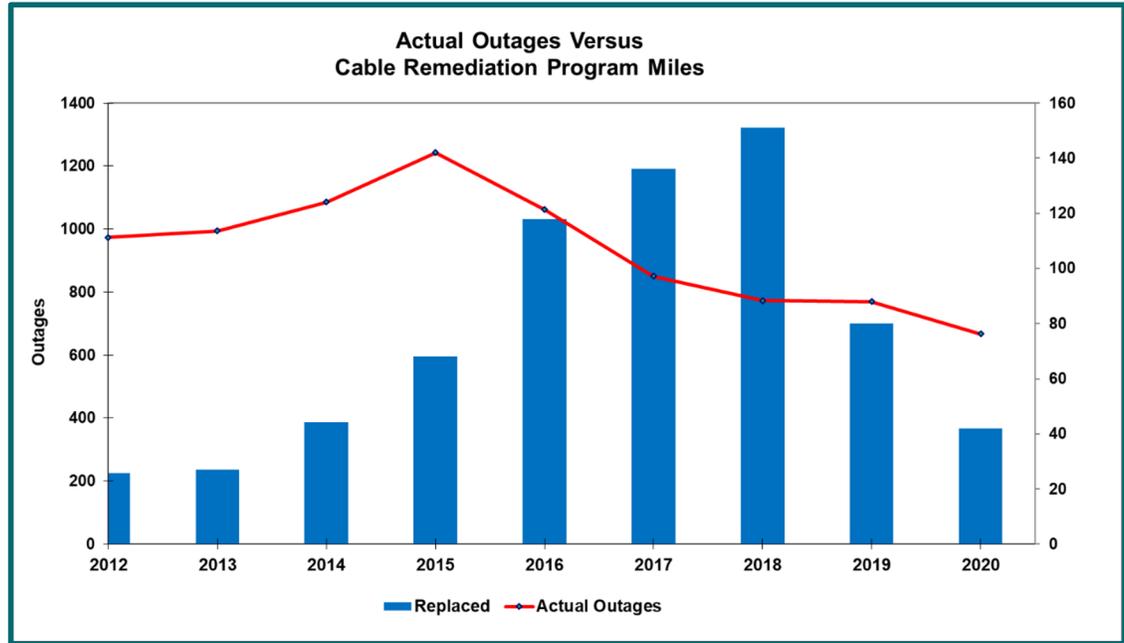
14 This is further demonstrated by programs such as PSE’s underground power cable
15 replacement program. Power outages due to failing cable were reduced by 38
16 percent between 2015 and 2020, as shown in Figure 2 below.

⁷ Dockets UE-170033/UG-170034, Puget Sound Energy 2020 Service Quality and Electric Service Reliability Report, p. 59.

⁸ SAIDI is the System Average Interruption Duration Index, and SAIFI is the System Average Interruption Frequency Index.

1

Figure 2: Cable Remediation Program



2

3

Q. What do you mean when you say that PSE’s progress to improve reliability can be masked by events outside PSE’s control?

4

5

A. Despite the progress discussed above, PSE’s system-wide SAIDI as it relates to non-major event day storms is starting to trend upwards, i.e., get worse. The benefits of PSE’s programmatic grid modernization was overshadowed in 2020 by an early January event in which restoration was slowed by inaccessible roads and, in one case, closure of Highway 2 for several days blocking any access to repair damage sustained in the Skykomish area. In addition, as damage was repaired, additional damage occurred from subsequent and ongoing wind and snow. In 2020, 16 percent of the year’s total non-major event day SAIDI, occurred in the first 14 days of the year and were associated with storms. These

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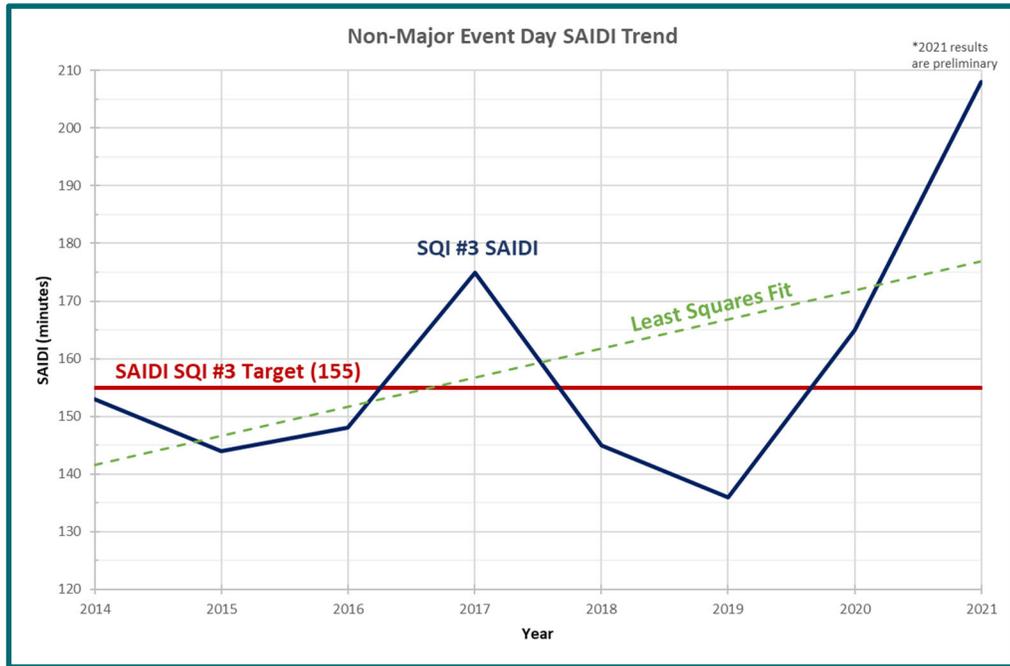
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1 14 days surrounded, but were not classified as, major event days. Had the days in
2 this two-week span been the same as any previous year going back to 2014, the
3 SAIDI for 2020 would have been below the benchmark.

4 **Figure 3: Non-Major Event Day SAIDI Trend⁹**



5
6 Though reliability as measured by SAIDI has deteriorated slightly in the last few
7 years and is projected to further deteriorate in the short term, the back-casting of
8 specific programs highlights the value of continuing to invest in programmatic
9 reliability improvements. Furthermore, a singular measure like system wide
10 SAIDI does not mean that PSE is not improving reliability. The Institute of
11 Electrical and Electronics Engineers (“IEEE”) benchmarking puts PSE’s SAIFI

⁹ Dockets UE-170033/UG-170034, Puget Sound Energy 2020 Service Quality and Electric Service Reliability Filing, Attachment A, p. 40 (Mar. 25, 2021).

1 performance in the second quartile, while PSE's SAIDI performance is in the
2 lower third quartile. For example, according to JD Power's Electric Residential
3 syndicated study, PSE's rank in the West Large segment has improved from 12 of
4 13 in 2016 to 5 of 13 in 2020. Over that same time period, PSE's score for power
5 quality and reliability satisfaction has improved from 710 in 2016 to 801 in 2020.
6 PSE's customer satisfaction is in the second quartile for providing quality electric
7 power, i.e., avoiding brief interruptions and providing accurate outage
8 information, but with respect to avoiding lengthy outages, which SAIDI
9 measures, PSE scores below average with business customers and in the fourth
10 quartile for residential customers, indicating that current SAIDI performance is
11 not meeting customer expectations.

12 **Q. What steps is PSE taking to address the SAIDI performance?**

13 A. To improve system wide SAIDI performance, more reliability focused
14 investment, including O&M spending, is necessary and aligns with customer
15 sentiments. This is an important component of the multiyear rate plan. In light of
16 the results discussed above, PSE is primarily focused on reducing the duration of
17 outages. PSE is focused on shortening restoration time through operational
18 improvements and focused investments such as distribution automation or
19 replacing long duration outage assets such as those from underground cables or
20 substation level assets. More detailed discussion is provided in the Prefiled Direct
21 Testimony of Catherine A. Koch, Exh. CAK-1T.

1 **E. PSE Is Focused on Delivering Natural Gas Safely For the Public and the**
2 **Environment**

3 **Q. Please elaborate on PSE's objective to deliver natural gas safely for the**
4 **public and the environment.**

5 A. PSE remains vigilant for opportunities to enhance and maintain pipeline system
6 integrity and reliability. This focus includes replacing or repairing all defects that
7 have been identified as high risk to the public and the environment. PSE's
8 distribution and transmission integrity management programs, annual continuing
9 surveillance reports, subsequent risk mitigation programs, and 35 accelerated
10 action programs, have continued to be effective.

11 Following the 2010 pipeline explosion in San Bruno, California, the Commission
12 began an investigation as to whether utilities should do more to enhance natural
13 gas safety.¹⁰ At the completion of the investigation, the Commission issued a
14 policy statement and authorized a new cost recovery mechanism that provides
15 utilities an incentive to accelerate replacement of pipe that presents an elevated
16 risk of failure.¹¹ PSE has been using this process to address high risk assets such
17 as the replacement of older DuPont pipes¹² in PSE's system before failure occurs,
18 retiring over 43 percent of the 435 miles of this pipe since 2013. From the end of
19 the test year, 245.3 miles remain and the full replacement is anticipated to be

¹⁰ See Commission Policy on Accelerated Replacement of Pipeline Facilities with Elevated Risk, Docket UG-120715 ¶ 12 (December 31, 2012).

¹¹ See *id.*, ¶ 58.

¹² Older plastic pipes manufactured by DuPont may be prone to leaks and possible failure due to their age, composition, and manner of installation.

1 completed in 2032. PSE refers to work aligned with this process and cost recovery
2 mechanism as Pipeline Replacement Program (“PRP”) Plan work.

3 **Q. Has the PRP work expanded since the inception of the program?**

4 A. Yes. With the recent policy outlined in RCW 80.28.420 that provides for a focus
5 on methane emissions reduction, PSE has expanded its PRP with the intent of
6 keeping every molecule of gas in the pipeline, advancing environmental safety.
7 PSE will focus on reducing methane emissions from a variety of leak causes, as
8 shown in Table 2 below.

9 **Table 2: Leak Causes**

Leak Cause	2020 Metric Tons CO2e
Excavation Damage	11,489
Natural Force Damage	1,443
Pipe, Weld, or Joint Failure	1,226
Other Outside Force Damage	1,050
Active Nonhazardous Leaks	874
Equipment Failure	387
Other Cause	374
Incorrect Operations	125
Corrosion Failure	90

10 The Commission approved PSE’s recent PRP in August of 2021.

11 **Q. How will this program change with the multiyear rate plan?**

12 A. With the new statute authorizing multiyear rate plans, PSE will include these
13 costs in the rate plan, rather than using the separate cost recovery mechanism

1 authorized by the Commission several years ago. This is discussed in more detail
2 in the Prefiled Direct Testimony of Susan E. Free, Exh. SEF-1T.

3 **Q. What other steps has PSE taken to enhance pipeline safety?**

4 A. In 2016, PSE embraced the industry and regulators interest in the American
5 Petroleum Institute’s (“API”) Recommended Practice 1173, a detailed guidance
6 published in 2015 regarding the implementation of a Pipeline Safety Management
7 System to improve overall safety and effectiveness of pipeline operation. Through
8 a three-year plan, beginning in 2020, PSE is enhancing its practices and
9 operations across ten system elements to further its robust safety culture. We
10 anticipate this guidance by API will become a binding regulation in the near
11 future, and PSE is leading the way in adopting these best practices.

12 Another requirement driving change is the recently approved PIPES Act of 2020,
13 which addresses in part the Merrimack Valley incident, a 2018 natural gas
14 explosion that occurred September 13, 2018. Included within the law are new
15 mandates for the Pipeline and Hazardous Materials Safety Administration
16 (“PHMSA”) to require operators to update, as needed, their existing distribution
17 integrity management plans, emergency response plans, and O&M plans. The law
18 also requires operators to manage records and update, as necessary, their existing
19 district regulator stations to eliminate a common mode of failure. PHMSA will
20 also require that leak detection and repair programs consider the environment and
21 the use of advanced lead detection practices and technologies. PHMSA will also

1 require operators to be able to locate and categorize all leaks that are hazardous to
2 human safety, the environment, or that can become hazardous.

3 As a result of the Merrimack Valley incident, PSE performed an external event
4 review of the incident. Various improvement activities were implemented to
5 prevent a similar event or risk from occurring at PSE, with a detailed look at the
6 PSE low pressure systems.

7 **Q. What is PSE doing to operate its natural gas system in a manner that is safe**
8 **for the environment?**

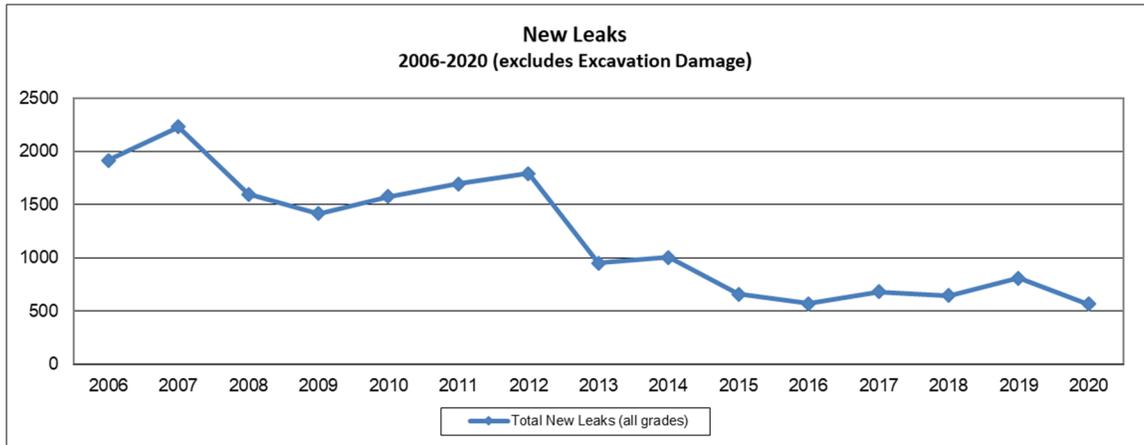
9 A. PSE's commitment to clean energy, in combination with methane emission
10 reduction focused laws like RCW 80.28.420 and the PIPES Act of 2020,
11 recognizes the need to modernize the pipeline system and change its operating
12 practices to keep every molecule of natural gas in the pipeline. Pipeline
13 modernization focuses on zero methane release and integrating renewable natural
14 gas, enabling a cleaner energy supply while leveraging the valuable underground
15 asset to bring greater customer benefits. PSE is beginning to prepare for increased
16 renewable natural gas, streamlining interconnection process and evaluating
17 system and people readiness for hydrogen blending which should become more
18 viable in the future and aligns with the intent of the Cap and Invest legislation
19 passed in 2020. PSE recognizes that additional opportunities exist to advance
20 pipeline safety with clean energy in mind. These programs and the PRP are

1 discussed further in the Prefiled Direct Testimony of Catherine A. Koch, Exh.
2 CAK-1T.

3 **Q. Has PSE’s work proved to be effective in delivering this objective?**

4 A. Yes. PSE has been audited annually for pipeline safety by the Commission’s
5 Pipeline Safety Staff. Over the past five years, PSE has passed these detailed
6 audits with no violations. With respect to pipeline integrity, the primary metric is
7 the number of leaks in the system. Over the last fifteen years, the number of new
8 leaks has decreased for all categories, or “grades” of leaks as shown in Figure 4.

9 **Figure 4: Number of New Leaks Annually 2006-2020**



10
11 Compared to the 2020 American Gas Association (“AGA”) national benchmarks,
12 PSE ranks in the second quartile for year-end active or open system leaks.

13 With these results, PSE continues to be focused on mitigating higher risk pipeline
14 assets along with enhanced consideration of methane emissions reduction and

1 readiness for integration of more, cleaner renewable natural gas. More detailed
2 discussion is provided in the Prefiled Direct Testimony of Catherine A. Koch,
3 Exh. CAK-1T.

4 **F. PSE Operates With an Efficient and Continuous Improvement Mindset**

5 **Q. Please describe PSE’s commitment to operational excellence, continuous**
6 **improvement, and efficient service.**

7 A. PSE actively seeks opportunities to improve performance and better serve its
8 customers. Examples of PSE’s commitment to excellence are provided below.

- 9 • With the implementation of Integrated Work Management
10 technology and processes, PSE is seeing improvements in both
11 customer service scheduling and worker productivity. Customers
12 are now able to request certain meter service appointments within a
13 two-hour window, an option not available before Integrated Work
14 Management. There is an increase in the number of field jobs
15 completed per day, and there is enhanced work management
16 visibility and reporting available to improve organizational
17 performance. Additional detail on Integrated Work Management is
18 discussed in the Prefiled Direct Testimony of Suzanne L. Tamayo,
19 Exh. SLT-1T;
- 20 • Customer satisfaction continues to grow. A customer satisfaction
21 survey is sent after every new customer construction project is
22 complete and as stated earlier has consistently achieved an average
23 satisfaction score of 8.5 out of 10;
- 24 • PSE looks for lower cost ways to perform high quality work. For
25 example, in certain situations where there is adequate remaining
26 integrity, PSE is able to add steel reinforcement to a wood pole to
27 return it to design strength rather than replace the pole. This
28 reinforcement results in cost savings of approximately 90 percent
29 per pole, as compared to the cost of pole replacement;
- 30 • PSE has implemented a new root cause analysis process to further
31 evaluate the cause of large-impact outages. The analyses look at

1 multiple potential issues that may contribute to reliability problems
2 such as environmental conditions and device failure;

- 3 • PSE is replacing its AMR system with AMI, which provides
4 foundational technology that will benefit customers
 - 5 ○ by the avoided cost of installing and maintaining an
6 obsolete AMR system,
 - 7 ○ through decreased energy consumption and bills, as
8 PSE is able to implement more conservation voltage
9 reduction,
 - 10 ○ by increased reliability, as PSE is able to use the
11 communication system for implementing distribution
12 automation, and
- 13 • PSE utilizes service level demand data to evaluate service
14 transformer loading and potential for overloading and failure as
15 was experienced during the 2021 extreme heat event.

16 Additionally, although not a primary driver of the project, AMI capabilities will
17 enable customer choices and will facilitate modernization of the grid through
18 continuous improvements in the future.

19 **Q. Please describe how PSE measures operational excellence and opportunities**
20 **for improvement.**

21 A. PSE uses benchmarking and its continuous improvement philosophy to establish
22 performance objectives. Certain targets are prescribed in codes and standards that
23 govern PSE's work or are found in the SQIs. Where performance is not
24 prescribed, PSE benchmarks its performance and stays attuned to industry
25 practices, risks, and policy changes. PSE also considers impacts and benefits to
26 customers when setting performance objectives, and those that directly tie to
27 safety are set to achieve top quartile performance. Additionally, PSE participates

1 in various industry organizations, forums, and activities to stay abreast of best
2 practices and learn from others. For example, PSE is active with the Institute of
3 Electrical and Electronics Engineers, which allows PSE to stay current on best
4 practices and standards regarding transmission and distribution system operations.
5 PSE also participates in events sponsored by the American Gas Association,
6 Commission Pipeline Safety Staff, PHMSA, and the U.S. Department of
7 Transportation to stay informed of trends, performance, and emerging issues in
8 the natural gas industry.

9 PSE strives for operational excellence by regularly reviewing performance and
10 practices, utilizing performance trends to drive improvements, and making work
11 plans and performance transparent in order to measure and confirm progress.

12 **Q. What challenges does PSE face as it continues to provide excellent service**
13 **now and in the future?**

14 A. One key challenge is the need to retain a highly competent workforce—a
15 workforce that is not only in short supply across the industry, but particularly in
16 this region where affordability is greatly impacted by the region’s economic
17 diversity and success. Whether it be technology company competition for
18 professional engineers and project managers or resiliency investments in
19 California attracting line crews away, PSE must be actively developing,
20 attracting, and retaining a workforce that can operate a grid and pipeline system
21 that will be more modern than the traditional systems. These expected changes

1 will require new training methods as well. PSE’s witnesses Catherine A. Koch,
2 Exh. CAK-1T, and Dawn M. Reyes, DMR-1T will discuss PSE’s new training
3 facility that will be completed by 2023.

4 **III. THE ENERGIZE EASTSIDE PROJECT IS NECESSARY TO ADDRESS A**
5 **TRANSMISSION CAPACITY DEFICIENCY AND TO PROVIDE RELIABLE**
6 **ELECTRIC SERVICE**

7 **A. Overview of the Energize Eastside Project**

8 **Q. Please describe the Energize Eastside project.**

9 A. The Energize Eastside project consists of the construction of a new 230 kV to
10 115kV electrical transformer that will be served by approximately 16 miles of
11 new high-capacity electric transmission lines (230 kV) on the east side of Lake
12 Washington, extending from Redmond to Renton (the “Eastside”). The electrical
13 transformer is located at a new substation near the center of the Eastside. The
14 project upgrades the existing transmission lines from 115 kV to 230 kV lines. The
15 project also includes plans for continued aggressive conservation measures.

16 **Q. Why is the Energize Eastside project necessary?**

17 A. The Energize Eastside project is necessary for PSE to address a transmission
18 capacity deficiency on the Eastside during peak periods and allow PSE to
19 continue providing reliable electricity service to its customers. This project will
20 improve reliability for the Eastside communities and supply the needed electrical
21 capacity for growth and development on the Eastside. The need for this project

1 has become even more urgent over the past few years. In four of the last five
2 summers the demand has exceeded the transmission capacity on the Eastside.
3 Most recently, the heatwave that hit the Pacific Northwest in 2021 caused the
4 actual demand to exceed the need threshold for the Energize Eastside project for
5 five days in a row and reached approximately 115% of the Area Load threshold
6 for which the studies verified a capacity deficiency exists.

7 **Q. Please elaborate on the delivery of power to the Eastside and why the**
8 **Energize Eastside project is needed.**

9 A. Electricity is currently delivered to the Eastside area through two 230 kV/115 kV
10 bulk electric substations – the Sammamish substation in Redmond and the Talbot
11 Hill substation in Renton – and distributed to neighborhood distribution
12 substations using 115 kV transmission lines. PSE has made many system
13 improvements in the Eastside area over the years, but the primary 115 kV lines
14 that connect the Sammamish and Talbot Hill substations (which are the backbone
15 of the Eastside electrical system) have not been upgraded since the 1960s. Since
16 then, the Eastside population has grown from approximately 50,000 to nearly
17 400,000. This growth is expected to continue. The Puget Sound Regional Council,
18 a regional planning agency with specific responsibilities under federal and state
19 law for transportation planning, economic development and growth management,
20 projected in 2014 that the Eastside population will likely grow by another third
21 and employment will grow by more than three-quarters over the next 20 years.

1 Federal regulations require PSE to have sufficient infrastructure to meet
2 foreseeable demand requirements or use corrective action plans (“CAP”) that
3 include intentional load shedding. Studies undertaken by PSE and multiple third
4 parties over the past decade demonstrate that the projected growth on the Eastside
5 could cause demand for electricity to exceed the capacity of the existing
6 infrastructure. Consistent with these projections, this level of demand has in fact
7 occurred multiple times in the summer months, since the project was first
8 initiated. This occurred most recently in the summer of 2021.

9 Electrical power transmitted to the new substation for distribution to local
10 customers will address this deficiency in electrical transmission capacity during
11 peak periods identified by PSE through its system planning process.

12 **Q. Is the Energize Eastside project operating and providing service to**
13 **customers?**

14 A. The Energize Eastside project is not yet completed in its entirety, but there are
15 elements of the project that are in service and providing benefits to customers. For
16 example, taller, more resilient, steel poles have been installed on the south phase
17 of the project and provide the existing 115 kV lines with greater clearances to
18 vegetation.

1 **Q. What is the timeline for completion of the Energize Eastside project?**

2 A. The Energize Eastside project is being constructed in two phases. This allows
3 PSE to keep the existing 115 kV facilities partially in-service during construction,
4 which will allow PSE to maintain reliable service to all customers during
5 construction. The new electrical transformer has been installed at the new
6 Richards Creek Substation, and construction of many of the new steel poles has
7 been completed as well. Construction for the south phase of the project, including
8 the new substation and electrical transmission lines from south Bellevue to
9 Renton, is anticipated to be completed and in service by the end of 2022. The
10 north phase of the project, from north Bellevue to Redmond, is anticipated to be
11 complete and in service by the end of 2023.

12 **Q. What is PSE requesting in this case with respect to the Energize Eastside**
13 **project?**

14 A. PSE requests recovery for plant associated with the Energize Eastside project that
15 has been put into service and is used and useful for service to customers, as well
16 as the plant that will be put into service during the course of the multiyear rate
17 plan, including PSE's return on the plant put in service. PSE requests that the
18 Commission determine that the Energize Eastside project is prudent—specifically
19 that there is a need for the transmission capacity and the Energize Eastside project
20 is a reasonable alternative to meet the need, when considering the alternatives.
21 PSE requests the Commission review the final costs of the Energize Eastside

1 project, once the project is completed, and that rates be subject to refund if PSE
2 does not appropriately execute on delivery of the project.

3 **Q. What is the projected final cost of the Energize Eastside project?**

4 A. The current projected cost of the Energize Eastside project is \$238 million, which
5 is within the range of the original cost estimate for the project. Please refer to the
6 testimony of Josh A. Kensok for projected project costs including allowance for
7 funds used during construction (“AFUDC”).

8 **Q. Please briefly describe the benefits of the Energize Eastside project to PSE’s**
9 **customers?**

10 A. The Energize Eastside project significantly improves reliability for Eastside
11 communities. The project supplies the additional electrical capacity needed today
12 for PSE’s customers as well as the electrical capacity needed to serve the actual
13 and anticipated growth that is projected for the Eastside. The project allows PSE
14 to comply with required federal reliability standards and avoid the use of harsh
15 CAPs such as load shedding, which would require PSE to turn the power off to
16 tens of thousands of customers under certain conditions to prevent more
17 widespread outages.

1 **Q. How does the Energize Eastside project support PSE’s core goals, including**
2 **its clean energy goals?**

3 A. To continually improve and provide reliable electric service and modernize the
4 electric grid throughout its service area, PSE uses a three-pronged, balanced
5 approach to deliver a reliable, resilient, smart, and flexible grid. As I discussed
6 previously, PSE is committed with unwavering diligence to meeting NERC
7 reliability standards, which are necessary to comply with CETA. Clean energy
8 driven by CETA means more distributed energy resources will connect to the grid
9 over the next ten years. It is critically important that PSE enhance the reliability
10 and resiliency of the grid to support these investments. The Energize Eastside
11 project is an infrastructure improvement project that supports PSE’s core goals of
12 reducing and eliminating power outages for customers, including increasing
13 community resilience during extreme events that will allow PSE to be successful
14 in its transformation to clean energy.

15 **B. Numerous Studies Demonstrate the Need for the Energize Eastside Project**

16 **1. Assessment of the Need**

17 **Q. When did PSE identify the need for more transmission capacity for the**
18 **Eastside area?**

19 A. The need for additional 230kV support for the Eastside area was anticipated and
20 has been included in PSE’s Electrical Facilities Plan for King County since 1993.
21 PSE performed annual electric transmission planning studies (“TPLs”), as

1 required by federal regulations, to determine if there are potential system
2 performance violations (transformer and line overloads) under various operational
3 scenarios, “contingencies”, and forecasted electrical use.

4 More recently, several studies performed by PSE beginning in 2008 identified
5 potential overloading of transformers at Sammamish and Talbot Hill substations
6 and that potential thermal violations may occur on facilities from Talbot Hill
7 Substation to Sammamish Substation.¹³ In 2009, PSE performed a comprehensive
8 system reliability assessment as it is required to do on an annual basis as part of
9 the NERC Compliance Enforcement Program. During the 2009 comprehensive
10 reliability assessment, PSE determined that there was a transmission reliability
11 supply need developing, should there be a loss of one of the Talbot Hill substation
12 transformers.

13 **Q. Please elaborate on the role of NERC in this process.**

14 A. NERC is the regulatory authority certified by FERC to develop and enforce
15 reliability standards. NERC reliability standards define the minimum reliability
16 requirements for planning and operating the North American bulk power system
17 and are developed using a results-based approach that focuses on performance,
18 risk management, and entity capabilities to ensure the Bulk Electric System
19 operates reliably.

¹³ These included the 2008 Initial King County Transformation Study, the 2009 PSE TPL Planning Studies and Assessment, and the 2012 PSE TPL Planning Studies and Assessment.

1 The NERC standards mandate that certain forecasts and studies must be
2 completed to determine if the system has sufficient capability to meet expected
3 loads now and in the future. When completing transmission planning assessment,
4 contingencies are simulated to determine if the electric system meets the
5 mandatory NERC performance requirements for a given set of forecasted demand
6 (load) levels, generation configurations and levels, and multiple system
7 component outages. Some of the performance requirements may have a low
8 probability of occurring. But the performance requirements were developed based
9 on best practices many years ago and when implemented provide the operators a
10 system that can be reliably operated over many unanticipated conditions and
11 following a wide range of contingencies. This conservative planning methodology
12 is implemented to prevent large scale, cascading, transmission system blackouts,
13 such as the 2003 Northeast blackout that affected 55 million people in the
14 Northeast and Midwest regions of the United States and Canada.

15 **Q. Can PSE ignore these reliability standards?**

16 A. No, PSE is not able to ignore the NERC mandatory reliability standards. PSE
17 must submit annual transmission assessment studies and self-certify compliance
18 to the NERC reliability standards. PSE is audited by the Western Electricity
19 Coordinating Council (“WECC”) on behalf of NERC for compliance with all
20 NERC standards and is subject to substantial penalties for failure to comply with
21 the NERC standards.

1 **Q. Did PSE perform additional studies after 2009 to assess the need for more**
2 **transmission capacity on the Eastside?**

3 A. Yes. In 2013 PSE worked with Quanta Technology to study the sufficiency of
4 transmission supply to PSE's customers and communities on the east side of Lake
5 Washington over the next ten years, which resulted in a needs assessment report.
6 PSE and Quanta Technology supplemented the report in 2015.

7 **Q. What were the results of the 2013 needs assessment report?**

8 A. The 2013 Eastside Needs Assessment verified that a transmission capacity
9 deficiency in the Eastside area of Lake Washington would develop by the winter
10 of 2017-2018 and Summer of 2018, and that the transmission capacity deficiency
11 was expected to increase beyond that date. Cities in the deficiency area included
12 Redmond, Kirkland, Bellevue, Clyde Hill, Medina, Mercer Island, Newcastle, and
13 Renton, as well as the towns of Yarrow Point, Hunts Point and Beaux Arts. The
14 timing of this study was intended to provide sufficient lead time to implement
15 viable, long term solutions before the issues identified by the study developed.
16 The 2013 Eastside Needs Assessment Report is provided as Exh. DRK-3. The
17 2015 Supplemental Needs Assessment Report is provided as Exh. DRK-4.

18 **Q. Please elaborate on the results of these studies.**

19 A. These studies demonstrated that, under certain contingencies, the transmission
20 delivery system on the Eastside could not continue to meet reliability

1 requirements without significant infrastructure upgrades. The studies identified
2 four major areas of concern:

- 3 i. Overload of PSE facilities in the Eastside area. Studies identified
4 potential overloading of transformers at Sammamish and Talbot
5 Hill substations; Several 115 kV transmission lines routing power
6 to the Eastside area are at risk of overloading under certain
7 conditions. For example, the loss of a transformer's capability to
8 supply power to the system can be for a number of reasons, such as
9 a lack of cooling due to failure of a cooling component, or a more
10 catastrophic failure of the windings inside the transformer.
11 Depending on the nature of the failure, this condition could exist
12 for a matter of days or months, due to the long duration needed to
13 repair or replace large transmission transformers;
- 14 ii. Small margin of error to manage risks from inherent load forecast
15 uncertainties. PSE's planning studies rely in large part on load
16 forecast data. Imbedded in PSE's load forecasts are several factors
17 that include elements of risk. These include conservation, weather
18 and block loads. Though these load forecast uncertainties were an
19 area of concern in the studies, they were superseded by reality
20 when actual summer peak demand exceeded what was forecast in
21 2017, and did so for four out of the last five years;
- 22 iii. Increased use and expansion of CAPs to keep the system
23 compliant. CAPs are a series of operational steps used to prevent
24 system overloads or loss of customers' power. They are a short-
25 term fix to alleviate potential operational conditions that could put
26 the entire grid at risk. They protect against large-scale, cascading
27 power outages; however, they can put large numbers of customers
28 at increased risk of power outages. For example, to prevent winter
29 overloads on the Talbot Hill transformer banks, PSE is already
30 using CAPs, which increases outage risk to customers. As growth
31 continues, additional CAPs will be needed. Operational CAPs are
32 intended to be short-term and not intended to be long-term
33 solutions to system deficiencies; and
- 34 iv. Impacts to interconnections identified by ColumbiaGrid. Though
35 the need for the Energize Eastside project is driven by local
36 demand, because the electric system is interconnected for the
37 benefit of all, it is a federal requirement to study all electric
38 transmission projects to ensure there are no material adverse
39 impacts to the reliability or operating characteristics of PSE's or

1 any surrounding utilities' electric systems. ColumbiaGrid, the
2 regional planning entity, produced a Biennial Transmission
3 Expansion Plan that addresses system needs in the Pacific
4 Northwest, including the PSE system.

5 **Q. Is there anything more you would like to add with respect to the findings of**
6 **PSE's 2015 Supplemental Needs Assessment Report?**

7 A. Yes, PSE's 2015 Supplemental Needs Assessment Report confirmed the
8 transmission capacity deficit findings in the 2013 Needs Assessment Report,
9 including a projected winter transmission capacity deficiency in 2019-20 that
10 would put approximately 63,200 Eastside customers at risk of outages; and a
11 summer deficiency that would place approximately 68,800 customers at risk and
12 could require load shedding, affecting approximately 10,900 customers at a time.
13 As previously noted, the level of need for peak demand in the summer for the
14 Energize Eastside project has been exceeded four out of the last five years, and in
15 2021 by nearly 700 MW. The 2015 supplemental report is provided as Exh. DRK-
16 4.

17 **Q. Please elaborate on the concerns raised in the 2013 and 2015 studies that**
18 **PSE's load forecasts imbed factors that include elements of risk.**

19 A. The three factors imbedded in PSE's load forecast that include elements of risk
20 are conservation, weather and block loads.

21 With respect to conservation, imbedded in the load forecast is the assumption that
22 PSE customers achieve 100 percent of the company's conservation goals, which

1 are very aggressive according to industry experts. If 100 percent of conservation
2 goals are not achieved, then the transmission system capacity will be surpassed
3 sooner than expected.

4 With respect to weather, PSE's load forecast assumes "every other year" cold
5 weather. Some utilities take a more conservative approach, using the coldest and
6 hottest weather in five or ten years, as inputs to system performance studies. If the
7 region experiences weather extremes outside of those used in PSE's planning
8 studies, electricity demand will surpass the transmission system capacity sooner
9 than expected.

10 The third factor, block loads, include large development projects that add
11 significant load to the system. If block load growth increases more than
12 anticipated, demand for electricity will surpass the transmission capacity sooner
13 than expected.

14 These factors are important when planning for needed infrastructure prior to the
15 level of need being reached and when relying on forecasted load to anticipate
16 when it will be needed.

17 **Q. Earlier you referred to load shedding, what is load shedding?**

18 A. Intentional load shedding (e.g., rolling blackouts) may be used as a corrective
19 action plan to meet the mandatory reliability requirements defined by NERC. It
20 would result in PSE having to turn the power off to tens of thousands of

1 customers under certain forecasted conditions to prevent more widespread
2 outages beyond the Eastside area. Intentional load shedding is not a practice that
3 PSE or many other responsible utilities use unless absolutely necessary, as it
4 adversely affects residential, commercial, and industrial customers. Load
5 shedding can lead to severe consequences and these events will often coincide
6 with extreme weather conditions when the system is being strained and when
7 customers need electricity the most.

8 **Q. Did PSE include the Energize Eastside project in its Integrated Resource**
9 **Planning process?**

10 A. Yes. PSE included transmission plans, including the Energize Eastside project in
11 its integrated resource planning process beginning with the 2015 IRP and all
12 subsequent IRPs.

13 **Q. Are there other studies that confirm the need to address the Eastside**
14 **transmission capacity deficiency?**

15 A. Yes, I discuss several of these studies later in my testimony.

16 **2. PSE Evaluated Alternatives and Determined that the Energize**
17 **Eastside Project was the Best Alternative to Address the Transmission**
18 **Capacity Deficiency**

19 **Q. Did PSE consider alternatives to the Energize Eastside project in order to**
20 **address the transmission capacity deficiency?**

21 A. Yes.

1 **Q. What solutions did PSE consider to address the transmission deficiencies?**

2 A. PSE studied a variety of potential solutions to resolve the Eastside transmission
3 deficiencies; these included additional conservation, additional generation,
4 demand response (“DR”), distributed generation (“DG”), energy storage,
5 expansion of transmission substations, transmission line upgrades and new 115
6 kV transmission lines. The results of these studies are documented in PSE’s
7 Solutions Report (2014), provided as Exh. DRK-5, and the Supplemental Eastside
8 Solutions Study Report (2015), provided as Exh. DRK-6. Additionally, in order to
9 obtain approval for the project, PSE was required to demonstrate it considered
10 alternatives during the State Environmental Policy Act (“SEPA”) Draft
11 Environmental Impact Statement (“EIS”) process and by multiple jurisdictions.

12 **Q. What criteria did PSE use to evaluate these potential solutions?**

13 A. PSE determined that any solution to solve this deficiency must meet all NERC
14 performance criteria, address all relevant PSE equipment overloads, and continue
15 to meet the performance criteria for at least ten years after construction. To define
16 the solution, PSE developed criteria to evaluate potential solutions. The criteria
17 are set forth in Section 2.5.1 of the 2015 Solutions Study, Exh. DRK-6. The Phase
18 I EIS, which is discussed later in this testimony, was another important
19 mechanism where PSE considered protentional solutions.

1 **Q. Please describe the “Additional Conservation” alternative that PSE**
2 **considered.**

3 A. PSE retained Energy and Environmental Economics, Inc. (“E3”) in 2014 to
4 conduct a Non-wires Alternatives Screening Study, which is provided as Exh.
5 DRK-7. E3 included energy efficiency, demand response and distributed
6 generation measures in its evaluation of cost-effective non-wires potential to
7 address the capacity deficiency in the Eastside area. The study concluded that the
8 cost-effective non-wires potential for the Eastside is not large enough to provide
9 sufficient load reduction to allow even a four-year deferral of Eastside
10 transmission upgrade needs.

11 The amount of additional conservation in the Eastside area required in the 2014
12 study, to avoid transmission upgrades, ranged from a low of 138 MW to a high of
13 244 MW. The minimum conservation level of 138 MW was in addition to
14 achieving 100 percent of the projected conservation for the entire PSE system
15 (424 MW from the 2014 Load Forecast); the high level of 244 MW was in
16 addition to achieving 75 percent of the projected conservation for the entire PSE
17 system (318 MW from the 2014 Load Forecast).

18 The study determined that the non-wires potential in the area, including energy
19 efficiency, demand response and distributed generation measures did not
20 represent a permanent solution to the need for the transmission upgrade options,

1 nor was it sufficiently cost-effective to defer the need date for transmission
2 upgrades while maintaining equivalent reliability levels.

3 **Q. Please describe the “Additional Generation within Eastside” alternative that**
4 **PSE considered.**

5 A. PSE studied both conventional generation and distributed generation in its 2015
6 Solutions Study. To be effective, this alternative would require at least 300 MW
7 of generation located in the Eastside area. Locating conventional generation of
8 this size on the Eastside has major siting and environmental challenges. For
9 distributed generation to meaningfully impact the identified needs, it must be
10 installed in the right locations, available when needed and be of sufficient
11 magnitude. Locating 300 MW or more of distributed renewable generation within
12 the Eastside area by the winter of 2017/2018 was not practical. As a comparison,
13 the total amount of system-wide DER included in PSE’s Clean Energy
14 Implementation Plan is 412 MW, including conservation, which demonstrates that
15 it is not feasible or reasonable to locate 300 MW of distributed renewable
16 generation in the Eastside area. The Eastside Solutions Study reports (2014 and
17 2015), Exh. DRK-5 and Exh. DRK-6, provide additional discussion of this
18 alternative.

19 **Q. Please describe the “Energy Storage” alternative that PSE considered.**

20 A. PSE contracted with Strategen in 2015 to perform an Eastside System Energy
21 Storage Alternatives Screening Study, which concluded that an energy storage

1 system with power and energy storage ratings comparable to PSE’s identified
2 need has not yet been installed anywhere in the world. In addition, Strategen
3 determined that the existing Eastside transmission system does not have sufficient
4 capacity to charge energy storage systems to a level sufficient to meet PSE’s
5 operating standards. The 2015 Strategen Eastside System Energy Storage
6 Alternatives Screening Study is included as Exh. DRK-8. The Strategen Study
7 was updated in 2018 and included as Exh. DRK-9.

8 Strategen evaluated a baseline configuration and two alternatives that also
9 included non-wires measures.

- 10 • The baseline configuration (Normal Overload Reduction) is not
11 technically feasible and would cost ratepayers approximately \$1.44
12 billion in net present value (“NPV”), based on PSE’s revenue
13 requirement.
- 14 • Alternative 1 (Emergency Overload Elimination) was technically
15 feasible but did not meet the reliability requirements.
- 16 • Alternate 2 (Normal Overload Elimination) is not technically
17 feasible and cost in excess of \$2.36 billion NPV.

18 **Q. Please describe the “Transmission Line Reinforcements and Transformer**
19 **Additions” alternatives.**

20 A. The transmission line reinforcements and transformer additions considered were a
21 combination of adding transformers and new 230 kV transmission lines to provide
22 a new transmission source for the Eastside area. This was considered after adding
23 transformers to existing substations failed to provide a sufficient solution.

1 The PSE team considered seven potential new 230 kV transmission lines and
2 seven potential transformer sites that could be combined into as many as 49
3 different alternatives. Combinations that were not practicable or were similar to
4 other potential solutions but not as effective were eliminated from further
5 consideration. This reduced the initial 49 potential alternatives down to 27
6 combinations. The next step of the screening process was to understand the
7 reliability impacts and help eliminate from the potential alternatives those which
8 were electrically infeasible. Power flow simulations were performed on the 27
9 potential alternatives, utilizing cases from the Needs Assessment and a set of
10 select contingencies, to determine the reliability impacts of each alternative. The
11 transformer sites closest to the load centers resulted in the most effective
12 performance. This resulted in 12 of the 27 potential alternatives being carried
13 forward. For each of the 12 proposed solution alternatives, the same power flow
14 simulations were performed as the ones performed in the 2013 Needs Assessment.
15 The results showed that the potential violations identified in the Needs
16 Assessment Report were mitigated by these solution alternatives. Of the 12
17 solutions considered, 5 were moved forward to the route selection process based
18 on their electrical performance, operational flexibility, and longevity (i.e., how
19 long they solved the deficiency). This process is discussed in further detail in the
20 2014 Solutions report included as Exh. DRK-5.

1 **Q. What did PSE determine to be the most effective solution to address the**
2 **transmission capacity deficiency in the Eastside area?**

3 A. After extensive study and evaluating and re-evaluating dozens of alternatives both
4 independently and through the Phase I and Phase II Draft EIS, PSE determined
5 that the most effective solution that meets all criteria and complies with the
6 federal performance requirements is the addition of a 230 kV/115 kV transformer
7 in the center of the Eastside load area. This new transformer would be connected
8 to new 230 kV transmission lines constructed between the Sammamish
9 (Redmond) and Talbot Hill (Renton) substations along with continued aggressive
10 conservation, which together constitute the Energize Eastside project. PSE's 2014
11 and 2015 Solutions Study (and supplement), Exh. DRK-5 and DRK-6, support
12 this determination.

13 **Q. Did PSE consider a combination of technological alternative solutions?**

14 A. Yes, PSE did consider a combination of these alternative solutions, but none met
15 the requirements set forth above. For example, the E3 Non-wires solution
16 analysis, Strategen's Eastside System Energy Storage Alternative Screening
17 studies, and the Draft Phase II EIS in Section 2 shows PSE considered a
18 combination of alternatives and PSE's solution includes infrastructure and
19 aggressive conservation considered in the studies discussed below.

1 **Q. Please elaborate on the aggressive conservation that is part of the Energize**
2 **Eastside project.**

3 A. All solutions proposed for the Eastside capacity deficiency are designed around
4 the impact of achieving 100 percent conservation targets. Conservation programs
5 are voluntary. Some program types require action by the customer, others can be
6 largely automated. Because customers can always opt out or decline to
7 participate, conservation programs to reduce peak demand include some risk. If
8 PSE is relying on a certain amount of load reduction from conservation to handle
9 a peak event but customers decide not to participate, then PSE must use other
10 resources to fill the customer's needs. PSE assumes it can meet 100 percent of
11 conservation goals in our studies. If 100 percent of goals are not achieved, the
12 need for the Eastside project would occur even sooner.

13 **Q. Is it best practice to rely on obtaining 100 percent of future conservation**
14 **targets?**

15 A. No. Most utilities do not rely on achieving all of their conservation targets as part
16 of their planning solutions. This is why PSE considers its solution as "aggressive"
17 and because of PSE's strong history of achieving past targets it is included as part
18 of the solution to address this need.

1 **Q. Are there other studies that support PSE’s decision to choose the Energize**
2 **Eastside project over the other alternatives?**

3 A. Yes, as I have previously noted there are several studies that evaluated the
4 Energize Eastside project including the following:

- 5 • Solutions Report and Supplemental Solutions Report conducted by
6 PSE and Quanta Technology in 2014 and 2015.
- 7 • The E3 Non-wires solution analysis, dated February 2014,
8 explored non-wires alternatives and the feasibility of solving the
9 identified problem without constructing a new transmission line. A
10 copy of the study is provided as Exh. DRK-7.
- 11 • Strategen Consulting performed an Eastside System Energy
12 Storage Alternative Screening Study in 2015 and updated the study
13 in 2018.
- 14 • The City of Bellevue contracted with Utility System Efficiencies,
15 Inc. (“USE”) to perform an independent technical analysis of the
16 purpose, need and timing of the Energize Eastside project, and this
17 study confirmed the capacity deficiency in the Eastside area. This
18 study is provided as Exh. DRK-10. This independent analysis
19 concluded that PSE followed industry practice in forecasting its
20 demand load. The independent technical analysis performed by
21 USE on behalf of the City of Bellevue further determined that:
 - 22 ○ the Energize Eastside project is needed to address the
23 reliability of the electric grid on the Eastside;
 - 24 ○ the project would still be needed if the load growth was
25 reduced; and
 - 26 ○ the project would still be needed if generation was increased in
27 the Puget Sound area.
- 28 • In addition to the above, during development of the Draft EIS, a
29 review memo by Stantec Consulting Services, Inc. dated July 31,
30 2015 summarized the EIS team subcontractor’s independent
31 analysis of project need: “PSE[’s] needs assessment was overall
32 very thorough and applied methods considered to be the industry

1 standard for planning of this nature. Based on the information that
2 the needs assessment contains, I concur with the conclusion that
3 there is a transmission capacity deficiency in PSE's system on the
4 Eastside that requires attention in the near future." The Review
5 Memo is provided as Exh. DRK-11.

- 6 • The Assessment of Proposed Energize Eastside Project, prepared
7 for the City of Newcastle by MaxETA Energy, PLLC, dated June
8 2020, showed that the current summer electric peak demand in
9 King County had already triggered an operational need for the
10 proposed transmission expansion to address system contingency
11 scenarios and ensure the security of the Bulk Electric System. The
12 study concluded that PSE has demonstrated that the proposed
13 transmission upgrades are needed to safeguard the operational
14 reliability of the electric system as a whole. A copy of the study is
15 provided as Exh. DRK-12.
- 16 • The POWER Engineers Lake Washington Submarine Cable
17 Alternative Feasibility Study, dated June 8, 2015, analyzed the
18 feasibility of installing the transmission line underwater through
19 Lake Washington. A copy of the study is provided as Exh. DRK-
20 13.
- 21 • The POWER Engineers Underground Feasibility Study, dated
22 March 2014, analyzed the feasibility of installing the transmission
23 line underground. A copy of the study is provided as Exh. DRK-
24 14.
- 25 • The EIS Phase I and II Chapters 2, and Final EIS Chapter 2 all
26 discuss the alternatives considered. A copy of the EIS Phase I is
27 provided as Exh. DRK-15, a copy of the EIS Phase II is provided
28 as Exh. DRK-16, and a copy of the Final EIS Chapter 2 is provided
29 as Exh. DRK-17.¹⁴

30 **Q. Have there been further updates to the studies discussed above?**

31 A. Yes. Utilities are required by NERC to assess their transmission reliability of their
32 systems every year and in an industry wide, acceptable manner. The NERC
33 transmission reliability planning standards are called TPLs, and the evaluations

¹⁴ The Final EIS can be found at <https://www.energizeeastsideeis.org/library.html>.

1 are called Annual Transmission Planning Assessments. NERC is delegated
2 authority to develop these mandatory planning standards by the Federal Energy
3 Regulatory Commission (“FERC”). The TPLs reflect an industry wide agreed
4 upon best utility practices. PSE’s entire transmission system is designed, built,
5 and operated upon these best practices. The TPLs require transmission companies
6 to model and assess their systems yearly in order to project what transmission
7 infrastructure improvements will be needed up to ten years into the future. This
8 allows utilities to plan for, develop solutions and build the improvements so that
9 they are in place before the identified problem comes to fruition, meaning, before
10 the identified concern fails.

11 Compliance with TPLs is mandatory and audited. If there is a transmission
12 violation resulting from one of the mandatory contingency requirements, a plan
13 must be developed to rectify the identified deficiency. PSE’s existing system is
14 designed and operated using the same standards as other utilities in the Western
15 Grid to ensure any solution we implement is not going to create problems for
16 other interconnected utilities. PSE is audited on how we plan our system and
17 WECC has consistently found that PSE plans its existing system in compliance
18 with the TPLs.

1 **Q. What do the updates show?**

2 A. All of these annual TPL assessments have shown that the transmission
3 deficiencies on the Eastside area exist and require a corrective action plan to
4 mitigate the violations.

5 **Q. Has FERC provided any guidance on the Energize Eastside project?**

6 A. Yes. FERC dismissed a complaint against PSE and others that was filed by
7 opponents of the Energize Eastside project. In dismissing the complaint, FERC
8 stated as follows: “Based on the record before us, we find that Puget Sound and
9 the other Respondents complied with their transmission planning responsibilities
10 under Order No. 890 in proposing and evaluating the Energize Eastside Project.”
11 FERC also concluded that “the Energize Eastside Project was proposed and
12 evaluated in accordance with the then-applicable transmission planning
13 requirements.”¹⁵

14 **Q. Has PSE continued to reevaluate the need for the Energize Eastside project
15 and other available alternatives during the course of the permitting process?**

16 A. Yes, PSE has continued to reevaluate the need for the Energize Eastside project
17 through the NERC TPL annual transmission assessments for the need.

¹⁵ FERC Docket No. EL-15-74-000, Order Dismissing Complaint (Oct. 21, 2015).

1 Additionally, PSE continued to reevaluate alternatives when it updated the
2 Strategen 2018 study on battery energy storage.

3 **Q. Please discuss any changes to PSE’s determination of need for the project**
4 **over the course of the past decade.**

5 A. To be clear, the need for the Energized Eastside project has not changed. The
6 process to determine need has not changed. The key inputs used to evaluate need
7 can vary over time such as annual peak load forecast, new generation coming
8 online, existing generation retiring and the location of such, and modifications
9 and additions to topology of the transmission system. Over the past ten years,
10 changes to the key inputs have been captured in the annual updates of power flow
11 base cases and IRPs.

12 One of the key inputs, which gets a lot of attention, is the annual IRP peak load
13 forecast. The IRP peak demand forecasts are based on forecasts of key demand
14 drivers that include expected economic and demographic behavior, conservation,
15 customer usage and weather. When these forecasts diverge from observed actual
16 behavior, so does the IRP forecast. The annual peak load forecast is reduced
17 significantly when forward projections of additional conservation savings are
18 applied. Over the past ten years the forecasts have varied from a positive
19 increasing trend to a negative decreasing trend and vice versa. In recent years, the
20 winter forecasts have pushed out the winter need for Energize Eastside with
21 increases in conservation, though not enough to defer the need. More recently, as

1 a result of Electric Vehicles, electrification through building code revisions, and
2 economic recovery, there is both a winter and summer need. Summer forecasts
3 have been underestimated due to increased usage of air conditioning whereby the
4 actual reliability load threshold, where the reliability standards are exceeded, has
5 occurred multiple times since project initiation. In fact, PSE exceeded that
6 reliability threshold in 2017, a year earlier than forecasted. Since then, PSE has
7 exceeded that reliability threshold in four of the last five years - 2017, 2018, 2020,
8 and 2021. In 2021 alone, during the June heat dome event, when temperatures
9 were above 110 degrees in parts of PSE's service area, PSE exceeded this
10 reliability threshold multiple days in a row.

11 **Q. How have recent events affected PSE's assessment of the need for the**
12 **Energize Eastside Project?**

13 A. Recent events have demonstrated that the Energize Eastside project is needed
14 today. The heatwave that hit the Pacific Northwest in 2021 exceeded the need
15 threshold for Energize Eastside for five days in a row and reached approximately
16 115 percent of the Area Load threshold. Additionally, in four of the last five
17 summers the demand has exceeded the transmission capacity and further
18 demonstrated the need for the project.

19 With respect to the winter capacity need, while some studies have questioned
20 PSE's projected winter forecast, the most recent PSE F21 load forecast shows an
21 increased winter need.

1 **3. PSE Engaged with Its Customers and the Public to Address the Need**
2 **For the Project and Alternatives**

3 **Q. What steps has PSE taken to engage with its customers and the public about**
4 **the need for the project?**

5 A. Since launching the Energize Eastside project, PSE has engaged the Eastside
6 community in a robust public involvement process. This process has included
7 formation of a Community Advisory Group, mailings, public meetings, and direct
8 outreach efforts to inform stakeholders about the project and to provide them with
9 opportunities to participate. In addition, PSE’s Energize Eastside website
10 provided project updates and functioned as a repository for project materials,
11 including maps, technical studies, the Community Advisory Group Final Report,
12 fact sheets on a wide range of topics, newsletters, meeting summaries and other
13 materials. As of September 2021, public outreach and involvement has included:

- 14 • 22 Community Advisory Group-related meetings;
- 15 • Six public open houses, two question and answer sessions, and two
16 online open houses at key project milestones;
- 17 • More than 650 briefings with individuals, neighborhoods, cities
18 and other stakeholder groups;
- 19 • More than 3,000 comments and questions received;
- 20 • More than 40 email updates to more than 1,500 subscribers;
- 21 • Ten project newsletters to more than 55,000 households;
- 22 • Ongoing outreach to more than 500 property owners, including
23 door-to-door and individual meetings; and
- 24 • Participation in 16 EIS-related public meetings.

1 **Q. What has been the response from the public to the Energize Eastside**
2 **project?**

3 A. The public has largely supported or been indifferent to the Energize Eastside
4 project. A group called Communities United for Reliable Energy (“CURE”),
5 supports the project. The group is made up of non-profits, businesses, health care
6 providers, educators, and engaged residents of the cities where Energize Eastside
7 will be permitted. This group, as well as other individuals, have been vocal in
8 their support of the project both generally and at public and permitting meetings.

9 A relatively small group of residents on or near the corridor have vocally opposed
10 the project, and their opposition has shifted in scope over the years. Initially,
11 opposition was primarily focused on the impacts of changing views for residents
12 in south Bellevue, and over the years the focus has grown to primarily arguing
13 that the Energize Eastside project is unnecessary and excessive. Many involved in
14 the primary opposition group have disseminated incorrect information over the
15 years, which has required the project team to spend a significant amount of time
16 in providing factual information at the request of customers, permitting city staff
17 members, and permitting city councilmembers. The primary opposition group has
18 generated a report that claims the Energize Eastside project is unnecessary,
19 though the report utilizes incorrect data in its calculations. This report was
20 determined to be irrelevant by a Hearing Examiner during the Conditional Use
21 Permit hearing process for the south Bellevue segment of the project.

1 **Q. Can you elaborate on the issues addressed in the community involvement**
2 **process?**

3 A. Yes, the public engagement process has taken place in three phases. The first
4 phase was the route discussion, which took place in 2014. The second phase was
5 the fieldwork and environmental review phase, which took place from 2015 to
6 2018. The third phase is property owner consultations, which began in 2016 and
7 is ongoing today.

8 **Q. Please describe the public engagement surrounding the route discussion.**

9 A. To provide a forum that would generate robust input from diverse community
10 stakeholders, PSE convened a Community Advisory Group to consider
11 community values when evaluating transmission line route options. The advisory
12 group spent a year learning about the Eastside's electrical system, participating in
13 meetings and workshops and evaluating 18 route options identified by PSE. In
14 addition to the Community Advisory Group, PSE involved the community
15 through public meetings, neighborhood meetings, briefings, and comments, which
16 provided Eastside residents opportunities to share their community values and ask
17 initial questions about the project. For details about the advisory group process,
18 please see the Community Advisory Group Final Report which is provided as
19 Exh. DRK-18. The final report reflects a majority of preferences and
20 recommendations approved by Community Advisory Group members, and a
21 small minority of members dissenting opinions were also included as Appendix B

1 to the Final Report. Over two-thirds of the Community Advisory Group members
2 supported the final recommendation, which contained two selected routes,
3 narrowed down from the 18 initial route options.

4 **Q. Please describe the public engagement associated with the fieldwork and**
5 **environmental review.**

6 A. In 2015, PSE began collecting field information necessary for design and
7 environmental review. PSE kept stakeholders informed about these fieldwork
8 activities to inform residents when crews were expected to perform surveys near
9 their homes and businesses.

10 In 2015, the project began environmental review, which includes preparation of
11 the EIS as part of the SEPA process. The City of Bellevue led the EIS process in
12 cooperation with Newcastle, Kirkland, Redmond and Renton, and a Final EIS was
13 issued on March 1, 2018. The SEPA process is a separate regulatory requirement
14 that must be completed before any permits may be issued and includes public
15 involvement milestones.

16 PSE has provided supplemental EIS notifications about major milestones and
17 comment periods to keep stakeholders informed and to support community
18 engagement. In addition, PSE has participated in eight scoping meetings and eight
19 draft EIS hearings over the two-phased EIS process.

1 **Q. Please describe the public engagement associated with the property owner**
2 **consultations.**

3 A. As project design progressed, PSE began reaching out to individual property
4 owners to share information and answer questions. In spring 2016, the project
5 team visited neighborhoods along the existing corridor and Factoria area to talk
6 with residents and business owners about the project. This door-to-door outreach
7 was conducted to help inform customers about the project status and to address
8 questions and concerns from property and business owners.

9 In September 2016, PSE began meeting with property owners and tenants along
10 the existing corridor to discuss property-specific design and tree replacement
11 plans. PSE shared the design for each specific property, including pole locations
12 and how PSE planned to access those locations during construction. These
13 conversations helped PSE refine its project design and better understand customer
14 interests and concerns.

15 During this period, PSE continued to share project information via the project
16 website, property owner meetings, newsletters, emails, briefings, letters, door
17 hangers (for fieldwork), comment responses, traditional and social media, videos,
18 and other tools to reach and educate a variety of audiences.

1 **Q. Has PSE made changes to the project as a result of this public outreach?**

2 A. Yes. PSE adjusted many components of the project in response to the comments
3 and concerns heard from public stakeholders. The routes selected for
4 consideration were chosen in response to the Community Advisory Group's
5 identified priorities, such as limiting the need to acquire a new corridor and
6 keeping as much vegetation in place as possible. The final route—the existing
7 transmission corridor—meets those considerations and responds to comments
8 from the EIS process. Meetings with property owners along the corridor during
9 early phases of outreach took into account pole locations, and as a result PSE
10 made the decision to place the new, upgraded transmission poles in approximately
11 the same location as the existing poles that will be removed. Further, PSE
12 adjusted individual pole locations based on feedback from property owners, such
13 as moving poles closer to property lines or fences to reduce impact on property
14 owners' yards.

15 PSE also made design changes in response to concerns about aesthetics. Keeping
16 new pole heights as low as possible in certain segments of the corridor was of
17 high importance in certain areas, and PSE responded by designing the project
18 with two, shorter steel monopoles instead of the single, taller steel monopole style
19 primarily being used in the corridor. PSE received feedback on the aesthetics of
20 the poles themselves, so PSE initiated a separate “pole finish” analyses to get
21 recommendations on which finish or color would help the poles blend into
22 existing landscape as much as possible.

1 Finally, as part of PSE’s vegetation replacement approach, PSE adjusted the
2 suggested replacement plant palette to include more native species in response to
3 a strong preference expressed by property owners during the outreach phase.

4 **C. The Cost and Scope of the Project are Reasonable**

5 **1. Scope of the Energize Eastside Project**

6 **Q. Please describe the work involved in construction of the Energize Eastside**
7 **project.**

8 A. The Energize Eastside project will require constructing a new 230 kV to 115 kV
9 substation, called Richards Creek, to be located on a PSE-owned parcel in
10 Bellevue. The Richards Creek substation property is located immediately south of
11 the existing Lakeside 115 kV substation, in Bellevue. The new Richards Creek
12 230 kV to 115 kV transformer will provide a new electrical capacity source for
13 the Eastside area.

14 To connect the transformer, PSE will replace two existing 115 kV lines that were
15 last upgraded in the 1960s with two 230 kV lines. Operating both lines at 230 kV
16 has the lowest potential for interaction with the petroleum product pipelines that
17 share the transmission line corridor. Electricity will be transmitted to the Richards
18 Creek substation at 230 kV and then the voltage will be lowered (“stepped
19 down”) to 115 kV for distribution to customers on the Eastside.

1 The existing transmission lines are located in PSE's Sammamish – Lakeside –
2 Talbot Hill corridor, which was established in the late 1920s and early 1930s.
3 Within this existing corridor, the proposed pole locations for the rebuilt lines will
4 generally be in the same locations as the existing poles. In some instances, there
5 may be advantages to moving pole locations to accommodate landowner
6 preferences and reduce potential environmental impacts (for example, to move
7 existing pole locations out of wetlands).

8 **Q. Please describe the permitting process required for the Energize Eastside**
9 **project.**

10 A. Each individual jurisdiction where the Energize Eastside project is located
11 (Renton, Newcastle, Bellevue, and Redmond) has its own individual permitting
12 process.

13 Consistent with its phased construction approach, PSE has focused on permitting
14 the south half of the project first. PSE's plan is to build and energize the new
15 Richards Creek substation in Bellevue and upgrade the transmission lines in south
16 Bellevue, Newcastle, and Renton first, then construct the northern portion in north
17 Bellevue and Redmond.

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1 **2. PSE Is Required To Obtain Numerous Permits for the Project**

2 **Q. What permits is PSE required to obtain for the Energize Eastside project?**

3 A. PSE has obtained, and continues to seek, permits from numerous jurisdictions.
4 There are more than a dozen jurisdictions, governmental agencies, and regulatory
5 bodies from which PSE must obtain a permit or authorization for the project, and
6 there are several dozen permits and authorizations that are required. Exh. DRK-19
7 provides a list of the permits and authorizations required, their status, and the
8 governing jurisdictions and agencies.

9 **Q. What is the current status of the permitting process?**

10 A. Energize Eastside has received conditional use permits (“CUP”) and related
11 permit approvals for south Bellevue and Renton and a CUP hearing in Newcastle
12 is scheduled for January 2022. Permit applications are undergoing review in north
13 Bellevue and Redmond.

14 **Q. Why is PSE proceeding with the Energize Eastside project before it has
15 obtained all required permits and authorizations?**

16 A. PSE has received all permits required to begin construction in South Bellevue and
17 Renton. There are no pending appeals on its permits. PSE is proceeding with
18 construction in these jurisdictions because the project is needed now. Peak
19 demand from PSE customers has exceeded the load level at which the project is
20 needed in four of the last five years. In other words, the Energize Eastside project

1 is needed now to bring PSE’s system into compliance with federal reliability
2 requirements. PSE will proceed with construction in Newcastle, connecting to the
3 ongoing work in South Bellevue and Renton, once the necessary permits have
4 been received.

5 **3. The Overall Project Costs Are Reasonable and Consistent with**
6 **Projections**

7 **Q. What are the projected overall costs of the Energize Eastside project?**

8 A. Currently, the Energize Eastside project is estimated to cost \$238 million.

9 **Q. What are the estimated project costs for the Energize Eastside project up to**
10 **the initial rate year and through the multiyear rate plan?**

11 A. The actual costs for the Energize Eastside project are \$122 million through
12 November 2021. The Energize Eastside project is under construction in Renton
13 and south Bellevue, and at the new substation site at Richards Creek. Completion
14 of this south phase of the project is anticipated by the end of 2022 at the earliest
15 but will likely extend into 2023 based on the permitting process, and the estimated
16 costs for the south phase is \$188 million. This includes all the development costs
17 of the project including the substation. The north phase of the project is projected
18 to be completed by 2024. The table below shows the expected capital
19 expenditures for Energize Eastside over the course of the multiyear rate plan:

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Table 3. Remaining Energize Eastside Multiyear Rate Plan Capital Expenditures

	Proforma Period (July - Dec 2021)	Gap Period (calendar 2022)	RY1 Period (calendar 2023)	RY2 Period (calendar 2024)	RY3 Period (calendar 2025)
E Eastside 230Kv Subs Richards Creek	5,577,798	1,261,637	-	-	-
E Eastside 230Kv Tlines	19,775,839	57,000,000	39,282,691	4,044,223	269,920

PSE witness Joshua A. Kensok provides the Board approved plant closings for the Energize Eastside project over the course of the multiyear rate plan in Exh. JAK-5. There are a few differences to note.

First, the overall cost listed for the project is higher in Exh. JAK-5 due to the inclusion of AFUDC. Second, the Board approved plan provided by PSE witness Joshua A. Kensok varies somewhat on the expected in service dates for the project. Exh. JAK-5 shows the substation going into service in 2022 (\$40.1 million) and both lines going into service in 2024, which differs from PSE’s projections, discussed above. While the substation is expected to be completed in 2022, it cannot go into service until at least one of the transmission lines is complete and energized, which may extend into 2023 for the south phase depending on the complexities of the permitting and construction process, as discussed above. This demonstrates the need for the Commission to allow flexibility in the projection and recovery of plant in the multiyear rate plan, particularly for multi-segmented projects such as this.

1 **Q. How have the Energize Eastside project’s estimated costs changed over the**
2 **project’s life cycle?**

3 A. The Energize Eastside project solution was estimated at between \$154 million and
4 \$289 million in 2014. PSE’s Corporate Spending Authorization (“CSA”) and
5 Project Implementation Plan (“PIP”) for Energize Eastside discusses the evolution
6 of the project plan and execution. The CSA is attached as Exh. DRK-20 and the
7 PIP is attached as Exh. DRK-21. The PIP is a regularly maintained and living
8 document over the course of the project lifecycle. When the project proceeded
9 through the design phase, the project was estimated at \$225 million. Currently
10 project costs are estimated at \$238 million. Please see the testimony of Roque B.
11 Bamba, Exh. RBB-1T, for a discussion of PSE’s PIP process and procedure as it
12 relates to the design phase in the Project Lifecycle Model. For Energize Eastside,
13 the major determining factors impacting cost variation over the project’s lifecycle
14 are 1) project route, 2) safety adjustments, and 3) the permitting process.

15 **Q. How did the project’s route selection impact cost estimates?**

16 A. Selection of the existing corridor was the least impactful environmentally and the
17 least cost option of feasible solutions. For example, the route options were
18 considered and discussed in the 2013 Tetra Tech study, the POWER Engineers
19 Underground Feasibility Study, Exh. DRK-14, and Lake Washington Submarine
20 Cable, Exh. DRK-13. The Tetra Tech Study is included as Exh. DRK-22

1 **Q. How has PSE addressed concerns raised throughout the project**
2 **development?**

3 A. The Energize Eastside EIS robustly analyzed and addressed various concerns as
4 compiled by partner city's EIS consultants/ experts and PSE responded to every
5 comment and question received. PSE incorporated those identified concerns in its
6 project design and subsequent permit applications. Although the EIS was
7 appealed, PSE prevailed because the EIS was adequate, and the EIS is now final.
8 PSE also received comments during the CUP application process for each
9 jurisdiction and PSE has responded to each of those comments or concerns
10 through the permitting jurisdiction.

11 Additionally, PSE extensively engaged with the community to share project
12 information, conduct door-to-door outreach, host meetings with property owners,
13 and otherwise respond to community feedback and concerns. These activities
14 were necessary for a project of this size and the permitting jurisdictions criteria
15 requires an extensive level of engagement with the community.

16 **Q. Have there been changes that affected the project costs?**

17 A. There have been no material changes to the project costs because the project cost
18 is still estimated within the initial range. But the duration and complexity of the
19 permitting process, multijurisdictional oversight, and the conditions imposed in
20 the CUP approvals all were contributing factors to the project costs. Selecting the
21 existing route minimized the property acquisition and utilized existing rights

1 because the route selected was an existing regional corridor. Permitting delays
2 have also contributed to the duration of the project. For example, the EIS process
3 took over three years, and in one jurisdiction PSE has had to wait over four years
4 to have a hearing on its CUP application. These delays in permitting increase
5 overall costs due to the escalated expenses in materials, labor, and the cost of
6 capital.

7 **4. PSE's Management and Board Were Kept Apprised of the Status of**
8 **the Project**

9 **Q. Please describe how PSE kept management and the Board informed during**
10 **the project.**

11 A. PSE regularly reported on the status of the project to PSE management and the
12 Board. Updates were provided in monthly officer meetings, monthly project
13 update via report, two presentations to Board by the project team, and other Board
14 updates provided by officers. The Energy Management Committee had two
15 presentations to approve the budget, scope, and schedule. Excerpts of PSE's
16 Board updates and presentations regarding the Energize Eastside project are
17 included as Exh. DRK-23. The presentations to PSE's Energy Management
18 Committee regarding the Energize Eastside project are included as Exh. DRK-24.
19 Updates provided to PSE's Asset Management Committee regarding the Energize
20 Eastside project are included as Exh. DRK-25.

1 **Q. Please describe the project governance and controls for the Energize Eastside**
2 **project.**

3 A. Energize Eastside followed PSE's robust governance procedure for a project of
4 this size, including with the use of Corporate Spending Authorizations and Project
5 Change Requests. For a more detailed discussion of PSE's governance procedures
6 and the Project Lifecycle Model, please see the testimony of Roque B. Bamba,
7 Exh. RBB-1T.

8 **D. The Energize Eastside Project Provides Benefits to Customers and the**
9 **Community**

10 **Q. What benefits does the Energize Eastside project provide for customers?**

11 A. It is necessary for PSE to provide power to our customers reliably. Energize
12 Eastside will enhance system reliability by increasing the electric transmission
13 capacity, eliminating the use of an active CAP and potential load shedding, which
14 would most likely occur during extreme hot and cold temperatures (summer and
15 winter peaks).

16 **IV. CONCLUSION**

17 **Q. Does this conclude your prefiled direct testimony?**

18 A. Yes, it does.