

**EXH. WTE-1CT
DOCKETS UE-___/UG-___
2019 PSE GENERAL RATE CASE
WITNESS: WILLIAM T. EINSTEIN**

**BEFORE THE
WASHINGTON UTILITIES AND TRANSPORTATION COMMISSION**

**WASHINGTON UTILITIES AND
TRANSPORTATION COMMISSION,**

Complainant,

v.

PUGET SOUND ENERGY,

Respondent.

Docket UE-19___

Docket UG-19___

PREFILED DIRECT TESTIMONY (CONFIDENTIAL) OF

WILLIAM T. EINSTEIN

ON BEHALF OF PUGET SOUND ENERGY

**REDACTED
VERSION**

JUNE 20, 2019

PUGET SOUND ENERGY

**PREFILED DIRECT TESTIMONY (CONFIDENTIAL) OF
WILLIAM T. EINSTEIN**

CONTENTS

I. INTRODUCTION 1

II. WATER HEATER AND GAS CONVERSION BURNER RENTAL SERVICES..... 2

 A. Overview..... 2

 B. Future of the Water Heater and Gas Conversion Burner Rental Services..... 5

III. GREEN DIRECT..... 10

 A. Overview..... 10

 B. Skookumchuck and Lund Hill Resource Acquisitions 14

IV. ONGOING AND ANTICIPATED PILOTS AND DEMONSTRATION PRODUCTS AND SERVICES 21

 A. Overview..... 21

 B. Electric Vehicle Charging Products and Services 22

 C. Smart Street Lighting..... 27

 D. Customer-Sited Energy Storage Demonstration Project..... 31

 E. Community Solar Product..... 36

V. CONCLUSION..... 38

PUGET SOUND ENERGY

**PREFILED DIRECT TESTIMONY (CONFIDENTIAL) OF
WILLIAM T. EINSTEIN**

LIST OF EXHIBITS

- Exh. WTE-2 Professional Qualifications
- Exh. WTE-3C Skookumchuck Wind Energy Project, LLC PPA
- Exh. WTE-4C Lund Hill Solar Project, LLC PPA
- Exh. WTE-5 Exhibit A to 2017 RFP for Renewable Energy
- Exh. WTE-6HC Green Direct First Open Season RFI Results
- Exh. WTE-7HC Green Direct Second Open Season RFP Results

1 **PUGET SOUND ENERGY**

2 **PREFILED DIRECT TESTIMONY (CONFIDENTIAL) OF**
3 **WILLIAM T. EINSTEIN**

4 **I. INTRODUCTION**

5 **Q. Please state your name and business address.**

6 A. My name is William T. Einstein, and my business address is 355 110th Ave. NE,
7 Bellevue, Washington, 98004-5591. I am employed by Puget Sound Energy
8 (“PSE”) as Director of Product Development and Growth.

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

11 A. Yes. Please see the First Exhibit to the Prefiled Direct Testimony of William T.
12 Einstein, Exh. WTE-2, for an exhibit describing my education, relevant
13 employment experience, and other professional qualifications.

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

15 A. My testimony addresses three primary subject matters. First, I address PSE’s
16 proposal regarding the future of its water heater and gas conversion rental
17 services. Second, I address the prudence of the generation resources that supply
18 PSE’s Green Direct product. Finally, I address several pilot and demonstration
19 projects that PSE has either just begun or projects on the horizon that PSE
20 anticipates implementing over the next few years.

1 **II. WATER HEATER AND GAS CONVERSION BURNER**
2 **RENTAL SERVICES**

3 **A. Overview**

4 **Q. Can you describe the history and origins of PSE’s water heater and gas**
5 **conversion burner rental services?**

6 A. PSE and its predecessor companies have offered equipment rental services to
7 customers as a regulated service for more than half a century. In the 1940s, one of
8 PSE’s predecessor companies, Puget Power & Light Co. (“Puget Power”), began
9 providing customers an optional “Storage Water Heating Service,” which for a
10 monthly charge, the company would furnish a time switch that connected to the
11 customer’s water heater and would activate the water heater. In 1961, Washington
12 Natural Gas (“WNG”) began offering customers natural gas conversion burners
13 for rent. WNG later expanded its rental options to customers to include gas
14 circulating heaters, furnaces, and water heaters, all as regulated services. In 1965,
15 Puget Power began offering electric water heaters for rent. In 1997, WNG and
16 Puget Power merged, forming PSE. PSE discontinued the electric heater leasing
17 service but continued the WNG equipment rental service. It has operated
18 continuously since that time.

19 **Q. What is the current status of PSE’s water heater and gas conversion burner**
20 **rental services?**

21 A. In 2000, PSE closed the services to new customers. While there are currently
22 about 29,000 participating customers, that number continues to decline each year.

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As of December 31, 2018, the number of customers under Schedules 71, 72, and 74 are shown in Table 1.

**Table 1. Total Customer Count
December 31, 2018**

Schedule	Customers
Schedule 71 - Residential Water Heater Rental Service	24,028
Schedule 72 - Commercial Water Heater Rental Service	2,428
Schedule 74 - Gas Conversion Burner Rental Service	2,661
Total Water Heater and Conversion Burner Customers	29,117

The annual revenue from the rental services for the year ending December 31, 2018, is \$5,837,290. The net book value on assets is \$7,901,031. Approximately 50 percent of the customer base has fully depreciated equipment as shown in Table 2.

**Table 2. Fully Depreciated Equipment
December 31, 2018**

Equipment Type	Count
Residential Water Heaters	10,955
Commercial Water Heaters	973
Conversion Burners	2,586
Total Fully Depreciated Assets	14,514
Total Assets	29,117
% of Total Assets Fully Depreciated	49.85%

1 **Q. Was PSE’s water heater and gas conversion burner rental services addressed**
2 **by the parties in PSE’s 2017 general rate case in Dockets UE-170033/UG-**
3 **170034?**

4 A. Yes. In that case, Commission Staff raised a series of concerns with PSE’s
5 services and recommended that the services to existing customers eventually be
6 terminated. I addressed Commission Staff’s concerns in my Prefiled Rebuttal
7 Testimony in that case, Exh. WTE-1T, Dockets UE-170033/UG-170034.

8 **Q. How did the parties agree to resolve Commission Staff’s concerns?**

9 A. The parties entered into a Multiparty Settlement Stipulation and Agreement
10 whereby PSE agreed to enter into a collaborative with Commission Staff and
11 other interested stakeholders to address the future of these services.

12 **Q. Has PSE engaged in a collaborative with Commission Staff and other**
13 **interested stakeholders?**

14 A. Yes. PSE has had discussions with Commission Staff, Public Counsel and The
15 Energy Project regarding the future of the services to existing customers. These
16 discussions are ongoing.

1 **B. Future of the Water Heater and Gas Conversion Burner Rental**
2 **Services**

3 **Q. What are PSE's plans for the future of the water heater and gas conversion**
4 **burner rental services?**

5 A. For the past several years, Commission Staff has recommended that PSE
6 progressively exit the water heater and conversion burner rental business. Given
7 that the services are currently closed to new customers, PSE agrees that the
8 services should end. Ending the services will allow PSE, the Commission, and
9 other stakeholders the opportunity to focus on providing new and emerging
10 products and services to customers, including other rental products that benefit
11 customers. While PSE plans to discontinue its water heater and conversion burner
12 rental services, it is currently exploring opportunities to provide customers
13 options to continue their water heater rental service with a third-party provider.

14 **Q. What is PSE's specific proposal for ending the water heater and gas**
15 **conversion burner rental services?**

16 A. PSE proposes to sell the water heater rental service to a third-party service
17 provider and end the conversion burner rental service. Selling the water heater
18 rental service to a third-party service provider would include a sale of the water
19 heater assets and an assignment of the customer agreements for the service.

20 **Q. Will selling the water heater rental service benefit participating customers?**

21 A. Yes. Selling the service to a third party provides participating customers the
22 option to continue their service with a third party, which could provide additional

1 benefits to customers. This may include more choice in water heater equipment
2 and potentially other home ancillary services.

3 **Q. How does PSE intend to move forward with selling the water heater rental**
4 **service and when does it anticipate starting that process?**

5 A. In June 2019, PSE issued a Request for Interest in purchasing the water heater
6 rental service. Following that process, PSE will issue a Request for Offer to
7 interested parties. PSE will then evaluate the offers it receives. Once a potential
8 buyer is identified and secured, PSE will file an application requesting
9 Commission approval to sell the water heater rental service under Chapter 80.12
10 RCW and Chapter 480-143 WAC.

11 **Q. How would PSE notify customers about the sale of the water heater rental**
12 **service?**

13 A. PSE will provide notice to customers of the intent to sell the water heater rental
14 service and their future options consistent with WAC 480-143-210 and WAC
15 480-90-194, concurrently or prior to filing the application requesting Commission
16 approval. Once the Commission approves the sale of the water heater rental
17 service, PSE will communicate with current rental service customers announcing
18 the planned transfer of ownership and their options. This customer
19 communication process will be detailed in the application requesting Commission
20 approval to sell the water heater rental business.

1 **Q. What options will PSE provide to customers who have water heaters that**
2 **have a remaining depreciation balance?**

3 A. Customers who rent equipment that is not fully depreciated would have the
4 following options upon notification:

- 5 1) Transfer the rental agreement to the new owner and
6 continue to make monthly payments;
- 7 2) Request to end the current rental agreement, pay any
8 residual balance and take ownership of the equipment; or
- 9 3) Request to end the current rental agreement and that the
10 equipment be removed by PSE.

11 **Q. What options will PSE provide for customers who have water heaters that**
12 **are fully depreciated?**

13 A. PSE will provide these customers with the same options as customers who do not
14 have fully depreciated equipment:

- 15 1) Transfer the rental agreement to the new owner and
16 continue to make monthly payments;
- 17 2) Request to end the current rental agreement and take
18 ownership of the equipment; or
- 19 3) Request to end the current rental agreement and that the
20 equipment be removed by PSE.

21 **Q. Why is PSE ending the conversion burner service?**

22 A. The gas conversion burner rental service was introduced decades ago as an option
23 for customers to retrofit their existing oil or coal-fired boilers and furnaces to
24 natural gas. At the time, and for years, this program served an important and
25 helpful service for customers to economically convert to natural gas. However,

1 the number of customers with rented conversion burners declines every year with
2 nearly 98 percent of conversion burners fully depreciated. As of December 31,
3 2018, PSE had 2,661 conversion burner customers and the annual revenue from
4 the conversion burner rental service for 2018 was \$507,296.

5 Given the size and decline in the program, PSE can better serve customers by
6 ending the conversion burner rental service and monthly rental fees, transferring
7 ownership of the equipment to the customer, and offering them programmatic
8 energy efficiency rebates for upgrades of their home heating equipment when the
9 customers desires to replace their conversion burner and vintage boilers and
10 furnaces with conventional HVAC systems.

11 **Q. How would PSE end the conversion burner service?**

12 A. PSE proposes to withdraw Schedule 74 Gas Conversion Burner Rental Service.
13 PSE will end the rental agreement with customers through notification consistent
14 with WAC 480-90-194, will transfer ownership of the conversion burner
15 equipment to the home or business owner, will provide customers referrals for
16 other third-party maintenance, if available, and offer existing programmatic
17 rebates on applicable energy efficient HVAC replacement equipment.

18 **Q. When does PSE plan to end the conversion burner service?**

19 A. PSE plans to file with the Commission a tariff filing to discontinue the conversion
20 burner service at the same time as, or before, PSE submits the application to sell
21 the water heater rental service.

1 **Q. How has PSE reflected the potential sale of the water heater rental service**
2 **and termination of the conversion burner rental service in this general rate**
3 **case?**

4 A. As discussed in the Prefiled Direct Testimony of John D. Taylor, Exh. JDT-1T,
5 PSE has currently proposed rates for these customers at a level equivalent to their
6 cost of service. This reduces the relatively sizeable amount of over-collection
7 reflected in current rates and begins to reflect the costs that will continue to be
8 borne by PSE's remaining gas customers when these services end. When it files
9 its application requesting approval to sell its water heater service under Chapter
10 80.12 RCW, PSE anticipates consolidating that filing with this general rate case
11 filing. At that time, PSE would propose fully reflecting the removal of all costs
12 and revenues associated with these services from the revenue requirement
13 determination in this case

14 **Q. What are PSE's plans if a buyer for the water heater rental service is not**
15 **secured?**

16 A. PSE will proceed with ending the conversion burner rental service and continue to
17 operate the water heater rental service to a specific future date of no more than
18 five additional years, phase out the operation of the service, and collaborate with
19 Commission Staff on operational guidelines during the interim period.

1 **III. GREEN DIRECT**

2 **A. Overview**

3 **Q. What is the Green Direct product?**

4 A. “Green Direct” is the marketing brand for PSE’s Voluntary Long Term
5 Renewable Energy Purchase Rider product created to meet the renewable energy
6 needs of PSE’s governmental and large corporate customers who consume at least
7 10,000 megawatt-hours (MWh) annually. The primary purpose of the product is
8 to provide large existing customers a direct link to an affordable renewable energy
9 option for up to 20-year contract terms.

10 **Q. How did PSE determine its need for Green Direct?**

11 A. In communications with customers regarding their needs, PSE determined that
12 several of PSE’s large corporate and government customers desired a renewable
13 energy product supplied by known resources, that provided a cost hedge over
14 time, and that would allow them to achieve their carbon reduction goals.
15 Customers were also interested in new projects that provided additional renewable
16 energy for our state and regional energy grid. To obtain this additionality,
17 customers were willing to sign long term agreements ahead of the project
18 development. Ultimately, customers signed agreements ranging in term from 10
19 to 20 years.

1 **Q. Has the Commission approved Green Direct?**

2 A. Yes. Green Direct was approved by the Commission as Schedule 139 in Docket
3 UE-160977.¹ PSE held extensive conversations with Commission Staff leading up
4 to an initial filing in July 2016, which was then approved by the Commission in
5 September 2016. Initial launch customers expressed their strong support for this
6 product during the approval process for Schedule 139. The Commission
7 authorized PSE to subscribe up to 75 average megawatts (aMW) under the tariff,
8 before conducting a review of the product’s impacts. Under the first filing, the
9 Commission also approved PSE’s proposed pricing for the Skookumchuck Wind
10 Energy Project (“Skookumchuck”) to be built in Lewis County, Washington,
11 which would account for the first 43 aMW (137 megawatts (MW)). In July 2018,
12 PSE received Commission approval for a second offering which would blend the
13 pricing for Skookumchuck with the 42 aMW (150 MW) Lund Hill Solar Project
14 (“Lund Hill”) in Klickitat County, Washington. Then, in October 2018, the
15 Commission approved a 10 aMW expansion of the product, to accommodate
16 additional customer demand by utilizing the full build-out potential of the Lund
17 Hill project.

18 **Q. Are participating customers covering the cost of Green Direct?**

19 A. Green Direct was filed pursuant to RCW 19.29A.090, which requires electric
20 utilities to offer “retail electricity customers qualified alternative energy

¹ *In the Matter of Tariff Revisions Filed by Puget Sound Energy*, Docket UE-160977, Order 01 (Sept. 28, 2016).

1 resources,” as well as ensuring that “all costs and benefits associated with any
2 option offered by an electric utility under this section must be allocated to the
3 customers who voluntarily choose that option.” Under Green Direct, participating
4 customers will be charged a fixed annual kilowatt rate that covers the full cost of
5 the power purchase agreement (“PPA”) executed for the dedicated resources, as
6 well as any administrative costs associated with the Schedule 139 tariff, including
7 losses, taxes, billing and tracking. In addition, customers will receive an Energy
8 Charge Credit for the energy-related production costs allocated to them in their
9 rates. The credit calculation is the product of two numbers: what has traditionally
10 been PSE’s Power Cost Adjustment baseline rate, inclusive of both fixed and
11 variable production costs, adjusted for revenue sensitive items (primarily the State
12 Utility Tax), and their share of PSE’s production costs classified as being related
13 to the supply of energy.² The Schedule 139 customers will continue to pay their
14 share of the numerous costs that go into paying for the electric system including
15 demand-related power, delivery and administrative costs through the existing base
16 tariff schedule.

17 **Q. What is the status of Green Direct?**

18 A. In accordance with the Commission’s approval of a total of 85 aMW, to meet this
19 threshold, Green Direct was executed in two Open Seasons, each phase bringing
20 on a new renewable energy project through a PPA. For the first Open Season,

² Currently, this is 75 percent of PSE’s overall production costs, with the remaining 25 percent being classified as demand-related. See the Prefiled Direct Testimony of Birud D. Jhaveri, Exh. BDJ-1T, for further discussion of the classification of PSE’s production costs.

1 PSE sourced the Skookumchuck project, as described above. For the second Open
2 Season, PSE sourced the Lund Hill project. Skookumchuck was forecast to begin
3 serving customers in the first quarter of 2019, but due to unanticipated delays in
4 obtaining federal and local permits, the project is now forecast to begin energy
5 transmission in late 2019. It is anticipated that Lund Hill will begin energy
6 transmission in 2021.

7 **Q. How have customers responded to Green Direct?**

8 A. Customer support for the product has been very strong. Since the initial approval
9 of the rate schedule by the Commission, more than 40 customers have subscribed
10 to participate, representing 85 aMW of load, indicating the product is fully
11 subscribed. In addition, PSE has since heard from several other customers
12 indicating their interest in the product. In designing the product, PSE took care to
13 listen to customer needs. As noted above, customers requested a product that
14 allowed them to meet their carbon reduction and renewable energy goals through
15 specific projects that could also demonstrate additionality. Customers like
16 Starbucks have informed PSE that Green Direct is an example of what they would
17 like to see in other green tariffs. PSE has also received positive recognition for
18 Green Direct from three national organizations: the National Renewable Energy
19 Lab's 21st Century Power Partnership cited it as an "Innovative Utility Offering
20 at the Distribution Edge"; the Center for Resource Solutions recognized PSE as a
21 "Leader in Green Power Market Development" for Green Direct; and lastly,

1 Smart Energy Decisions gave PSE its 2019 Innovation Award for the
2 development of Green Direct.

3 **Q. What action is PSE requesting with respect to Green Direct?**

4 A. PSE requests a Commission determination that the Skookumchuck and Lund Hill
5 PPAs that PSE has sourced for Green Direct are prudent. As previously discussed,
6 the Commission and stakeholders have already reviewed information related to
7 the cost and need for these PPAs in the Green Direct tariff filings. However,
8 because these are new resources in PSE's power portfolio, PSE is requesting a
9 determination from the Commission that the acquisition of the Skookumchuck
10 and Lund Hill resources are prudent.

11 **B. Skookumchuck and Lund Hill Resource Acquisitions**

12 **Q. Describe the resources utilized to provide the resource options under Green**
13 **Direct.**

14 A. For the first Open Season, PSE selected the Skookumchuck project, in
15 development by RES America Developments, Inc. PSE executed a 20-year PPA
16 with Skookumchuck Wind Energy Project, LLC, for the full output of the facility
17 in April 2017. Please see the Second Exhibit to the Prefiled Direct Testimony of
18 William T. Einstein, Exh. WTE-3C, for a copy of the Skookumchuck PPA.
19 For the Second Open Season, PSE selected the Lund Hill project, in development
20 by Avangrid Renewables, LLC. PSE executed a 20-year PPA with Lund Hill
21 Solar, LLC, for the full output of the facility in November 2018. Please see the

1 Third Exhibit to the Prefiled Direct Testimony of William T. Einstein, Exh. WTE-
2 4C, for a copy of the Lund Hill PPA.

3 **Q. How did PSE determine that Skookumchuck and Lund Hill were**
4 **appropriate resource acquisitions for Green Direct?**

5 A. In discussion with potential product customers, PSE identified several project
6 attributes that helped guide the resource acquisition process. Potential customers
7 expressed preference for renewable energy projects that: (1) were new projects,
8 thereby providing additionality; (2) were located in proximity to customer load;
9 and (3) represented comparative cost effectiveness. Along with these customer-
10 driven considerations, the resource acquisition process attempted to identify
11 projects that were sized appropriately relative to customer demand and approved
12 product sizing (85 aMW), and were located on, or delivered to PSE's transmission
13 system in order to ensure deliverability to potential customers. As a new wind
14 energy project located in western Washington on PSE's system, Skookumchuck
15 met all of these considerations. Likewise, Lund Hill offered additionality as a new
16 project located in Washington with deliverability to PSE's system, as well as
17 being a solar complement to Skookumchuck.

18 **Q. Please describe the evaluation of alternatives performed by PSE.**

19 A. PSE sought formal offers for renewable resources to meet the needs of both
20 phases of Green Direct. PSE evaluated the proposals in a manner generally
21 consistent with prior electric resource acquisitions, based on applicable criteria set
22 forth in Exhibit A to the 2017 RFP for Renewable Energy (provided as the Fourth

1 Exhibit to the Prefiled Direct Testimony of William T. Einstein, Exh. WTE-5),
2 and consistent with the customer preferences previously described in this
3 testimony. PSE's evaluation criteria have been designed and tested over the
4 course of numerous competitive procurement processes. The criteria form the
5 basis of PSE's evaluation, which considers a variety of quantitative and
6 qualitative factors to compare the costs, risks and merits of individual proposals.
7 At a high level, PSE's analysis included consideration of capital costs,
8 transmission costs, ability to meet voluntary product subscriber need, project
9 feasibility, developer experience, acceptable offer terms, and alignment with
10 customer preferences for the product, among other factors.

11 **Q. What alternatives did PSE consider before entering into the Skookumchuck**
12 **PPA?**

13 A. For the first Open Season, PSE issued a Request for Information ("RFI") for
14 resources that could meet the needs of a potential new voluntary customer
15 product. At the time, there were only a few customers inquiring, so the focus was
16 on projects in the 5-10 MW range. In response to the RFI, PSE received
17 18 discrete proposals from eight respondents. Resource types included wind, solar
18 and hydro projects ranging in size from less than 1 MW to a little more than
19 100 MW. While most proposed projects were sized below 20 MW, three
20 proposals offered projects at approximately 100 MW in size. In addition to the
21 RFI proposals, PSE received two unsolicited offers for wind resources larger than
22 100 MW around the same time.

1 **Q. What were the results of the Green Direct first Open Season cost analysis**
2 **performed by PSE?**

3 A. PSE's analysis determined that the RFI proposal costs (between \$█/MWh and
4 more than \$█/MWh levelized) were higher than what customers were willing to
5 pay. However, two large unsolicited proposals offered economies of scale that
6 made them comparatively more cost effective and resulted in approximately half
7 the cost of the alternative smaller projects. At \$█/MWh levelized, the
8 Skookumchuck PPA offered the lowest cost option for customers compared to
9 alternatives. The Fifth Exhibit to the Prefiled Direct Testimony of William T.
10 Einstein, Exh. WTE-6HC, contains a listing of the RFI proposal costs prior to
11 PSE receiving the Skookumchuck proposal.

12 **Q. What alternatives did PSE consider before entering into the Lund Hill PPA?**

13 A. For Phase II, PSE issued an RFP for Renewable Energy to acquire sufficient
14 resources to meet expected incremental product need. In response to the RFP,
15 PSE received 45 discrete proposals from 31 respondents. Resource types included
16 wind and solar projects ranging in size from less than 20 MW to 600 MW. Most
17 proposals offered between 100 and 200 MW.

18 **Q. What were the results of the Green Direct second Open Season cost analysis**
19 **performed by PSE?**

20 A. The second Open Season evaluation was conducted in late 2017 and in the first
21 quarter of 2018 at a time when renewable prices had begun to drop. By the end of

1 **Q. Were customers aware of Green Direct costs and the Skookumchuck and**
2 **Lund Hill power sources prior to entering into contracts?**

3 A. Yes. As I explained above, Green Direct is a completely voluntary product and
4 has been met by overwhelming customer interest. Following Commission
5 approval of Schedule 139, customers were able to fully review the product pricing
6 for the term options they selected prior to signing their customer commitment
7 agreements. This is the case for each phase of Green Direct. PSE met with
8 customers multiple times, ahead of open enrollment, to explain the product and
9 pricing models. Customers were provided resources with usage and pricing
10 information that allowed them to adjust their projections for future energy prices
11 and evaluate the cost impacts corresponding to those projections.

12 **Q. Did PSE make any commitments in conjunction with the Commission's**
13 **approval of Green Direct?**

14 A. Yes. PSE committed to track all costs and benefits of Schedule 139 separately and
15 identifiably in its Power Cost Adjustment ("PCA") mechanism; to seek a
16 prudence determination for and recovery of the costs associated with the
17 acquisition of any PPA in a general rate case or Power Cost Only Rate Case; to
18 file its National Renewable Energy Laboratory ("NREL") annual reports in
19 Docket UE-160977; and to engage interested parties in advance of acquiring the

1 next set of resources or filing a tariff revision to assure that the best-priced
2 resources are acquired through a more transparent and competitive process.³

3 **Q. What is the status of those commitments?**

4 A. PSE has fulfilled, or is in the process of fulfilling, the commitments it made in
5 that case, as follows:

- 6 • PSE will track all costs and benefits of Schedule 139
7 separately and identifiably in its PCA mechanism when the
8 projects come on line;
- 9 • PSE is seeking a prudence determination for the PPAs
10 entered into under Schedule 139 in this general rate case;
- 11 • The NREL report is related to all of PSE's voluntary
12 renewable programs and PSE completed and filed its first
13 NREL report on July 31, 2018, in Docket UE-160977.
14 Since Green Direct has not yet begun generating electricity,
15 there is no information to report for the product. PSE will
16 add Green Direct to its future NREL reports, when Green
17 Direct generation information becomes available; and
- 18 • As described above, in entering into the Lund Hill PPA,
19 PSE followed a comprehensive and competitive RFP
20 process which resulted in the lowest cost option for
21 customers compared to alternatives. To the extent PSE
22 seeks to further expand Green Direct in the future, it will
23 follow a similar process soliciting input from interested
24 parties through a transparent and competitive process.

³ *In the Matter of Tariff Revisions Filed by Puget Sound Energy*, Docket UE-160977, Order 01 at ¶ 10 (Sept. 28, 2016).

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**IV. ONGOING AND ANTICIPATED PILOTS AND
DEMONSTRATION PRODUCTS AND SERVICES**

A. Overview

Q. What ongoing or anticipated products and services are you addressing in your testimony?

A. PSE is operating several pilot and demonstration products and services, one of which has already initiated, and others which PSE anticipates will begin in either 2019 or early 2020. Each of these products and services are focused on the development or implementation of new technologies that could provide additional new energy solutions and potential optional products and services for PSE customers. These products and services include:

- 1) Electric transportation products and services under Schedules 551, 552, 553, 554 and 583;
- 2) Smart lighting service;
- 3) Energy storage project; and
- 4) Community solar product.

Q. Why is PSE providing testimony about these projects now?

A. Since most of these products and services will be implemented primarily during the rate year and beyond, my testimony provides support for the expenses that will be incurred during those years. For products and services that have not yet gone into service, my testimony describes PSE's anticipated plans for these products and services and their future role in PSE's customer optional product

1 offerings. PSE will continue to work with the Commission and stakeholders to
2 gain approval to implement these products and services at the appropriate time.

3 **B. Electric Vehicle Charging Products and Services**

4 **Q. What are PSE’s Electric Vehicle Charging products and services?**

5 A. PSE’s Electric Vehicle (“EV”) Charging products and services are a portfolio of
6 pilot products that provide a balanced portfolio of services to customers and
7 support market transformation. The services include:

- 8 • Education and Outreach;
- 9 • Single-Family Residential and Off-Peak Charging;
- 10 • Multi-Family Residential Charging;
- 11 • Workplace/Fleet Charging;
- 12 • Public Charging; and
- 13 • Direct Service to Low Income Customers.

14 This portfolio of services was designed to balance several factors:

- 15 • Improving access to electric vehicle charging in multi-
16 family residences, workplaces, and fleets, which have been
17 identified as challenging areas of market development that
18 need improved access;
- 19 • Focusing on load management in the area where most
20 energy for electric vehicle charging is delivered today—
21 single-family homes—and building a baseline for potential
22 future load management in multi-family, workplace, and
23 fleet settings; and
- 24 • Providing additions to the network of fast charging sites to
25 improve its availability to customers.

1 In addition, the portfolio provides for education and outreach on transportation
2 electrification to all customers and direct service to low-income customers.

3 **Q. How were PSE’s Electric Vehicle Charging products and services initiated?**

4 A. EV services build off of (i) PSE’s previous work to establish a baseline load shape
5 for residential electric vehicle charging in Dockets UE-131585 and UE-140626,
6 (ii) research on industry trends and utility programs in Washington and other
7 states, and (iii) RCW 19.28.360 and the related Interpretive Statement Concerning
8 Commission Regulation of Electric Vehicle Charging Services under Docket UE-
9 160799 (“Policy Statement”), which provided clarification regarding the
10 Commission’s jurisdiction and policy direction regarding the role of investor-
11 owned utilities in the electrification of Washington’s transportation system.

12 The Policy Statement recommended the formation of a Joint Utility
13 Transportation Electrification Stakeholder Group (“Stakeholder Group”),⁴ which
14 PSE joined. As part of the requirements of the Policy Statement, PSE circulated a
15 draft of its proposed pilot services to the Stakeholder Group on June 22, 2018.
16 Following review and feedback from the Stakeholder Group, on October 26,
17 2018, in Docket UE-180877, PSE filed five new schedules which would establish
18 several new Electric Vehicle Supply Equipment (“EVSE”) pilot products and
19 services for customers:

- 20 • Schedule 551: Electric Vehicle Non-residential Charging
21 Products and Services

⁴ Policy Statement ¶ 91.

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- Schedule 552: Electric Vehicle Residential Charging Products and Services
- Schedule 553: Electric Vehicle Education and Outreach
- Schedule 554: Electric Vehicle Low Income Transportation Service
- Schedule 583: Electric Vehicle Charging Products and Services

On December 13, 2018, Commission Staff filed an Open Meeting memorandum where Staff reviewed PSE’s proposed EVSE schedules and recommended the schedules be approved by operation of law, on the condition that PSE utilize interoperability and universal payment optionality in its selection process when acquiring EVSE products and services.

In accordance with Commission Staff’s recommendation, the proposed schedules went into effect on December 14, 2018.

Q. Please describe each of the EVSE pilot products and services.

A. The EVSE pilot products will provide the following services, as follows:

Schedule 551: Electric Vehicle Non-residential Charging Products and Services – This schedule includes the workplace and public charging products,

which allows for the installation of approximately 150 Level 2 EVSE in workplaces and up to eight locations for public fast charging. PSE will collect data from these chargers and participants, including data on usage of the chargers and customer awareness of electric transportation. PSE will also collect revenue

1 for the use of the public fast chargers at a rate set to the market average and
2 adjusted periodically.

3 **Schedule 552: Electric Vehicle Residential Charging Products and Services** –

4 This schedule includes the multi-family residential charging and single-family
5 residential charging and off-peak charging products. Under these products, PSE
6 will install approximately 75 Level 2 chargers in multi-family residential
7 buildings and 500 chargers in single-family residential buildings. PSE will collect
8 data from these chargers and participants, including data on usage of the chargers
9 and customer awareness of electric transportation. PSE will also provide
10 incentives to customers in single-family residential buildings to charge at
11 specified times and measure the customers' performance in charging at those
12 times. Finally, PSE will test alternative technologies, including information from
13 electric vehicles, to measure the times at which customer charge.

14 **Schedule 553: Electric Vehicle Education and Outreach** – In this service, PSE

15 will provide general information and education on transportation electrification
16 technologies, charging, and benefits to customers. The information will be
17 provided through a variety of channels, including PSE's website, digital and paper
18 communications, and through in-person events. This work will be completed both
19 through PSE's existing communication channels, new communication channels,
20 and partnerships with other stakeholders in electric transportation.

21 **Schedule 554: Electric Vehicle Low Income Transportation Service** – In this

22 service, PSE will test electric transportation in applications that are used by low

1 income customers. Several potential opportunities, including electrification of
2 medical transportation, shared transportation programs in housing developments,
3 and electrification of services to low income customers were identified in the
4 filing. These were developed in collaboration with agencies serving low income
5 customers. Partnerships with agencies providing transportation services to
6 customers will be part of providing these products.

7 **Schedule 583: Electric Vehicle Charging Products and Services** – This
8 schedule provides the terms and conditions of the products and services.

9 **Q. Why is PSE implementing these schedules?**

10 A. Electrification of the transportation sector has been growing in recent years, with
11 approximately 42,542 electric cars currently in Washington. PSE’s most recent
12 forecast indicates that there will be approximately 159,000 electric vehicles in
13 PSE’s electric service territory by 2030. In addition, there will be electric transit
14 buses and there could be other forms of electric transportation. PSE estimates that
15 in 2030, customers may require over 500,000 MWh per year for electric
16 transportation. Electric transportation offers customers lower and more stable fuel
17 costs, as well as a lower emissions fuel. One concern with the electric load from
18 transportation is that it could increase the peak need on the electric system, which
19 could drive the need for new infrastructure.

20 The role of utilities in electric transportation has been discussed in Washington
21 and across the country. The Washington Legislature determined that “utilities,
22 who are traditionally responsible for understanding and engineering the electrical grid

1 for safety and reliability, must be fully empowered and incentivized to be engaged in
2 electrification of our transportation system.”⁵ The Commission similarly found in
3 the Policy Statement that there was a public benefit to utility engagement in
4 electric transportation and provided a framework for how utilities should provide
5 such services. This includes that utilities should offer a portfolio of products, the
6 need to serve all customers, including direct service to low-income customers, the
7 provision of education and outreach to customers, and focusing on avoiding
8 additional peak demand.⁶

9 PSE incorporated the legislative direction and the Policy Statement in the design
10 of its pilot products and services.

11 **Q. What are the next steps regarding PSE’s transportation electrification**
12 **products and services?**

13 A. PSE is finalizing the implementation of these products and services in anticipation
14 of enrolling customers starting in July 2019.

15 **C. Smart Street Lighting**

16 **Q. Please describe PSE’s smart street lighting service.**

17 A. PSE is planning to offer a new smart street light control service where PSE will
18 install smart lighting controls as part of Light Emitting Diode (“LED”) upgrades
19 on existing PSE-owned High Pressure Sodium street lights to enhance the

⁵ RCW 80.28.360.

⁶ Policy Statement ¶¶ 73-77.

1 operational efficiency, reliability, and performance of PSE's street light system.
2 The smart lighting controls communicate through a secure network to a central
3 operating platform, so PSE can remotely monitor and manage the performance of
4 each light in real time.

5 **Q. Why is PSE planning to offer smart street lighting?**

6 A. Currently, PSE has limited information regarding the status or performance of the
7 approximately 100,000 street lights owned by PSE, except through primarily
8 customer outage calls or in-person inspections. This results in PSE rolling a truck
9 to individual lights in response to an outage call to diagnose a failure, and often a
10 secondary trip is required to fix the problem. Enhanced remote management with
11 a smart street light service means performance issues will be detected
12 automatically, leading to the generation of a detailed work order containing all
13 necessary information for the repair crews to dispatch and complete their work.

14 In addition, several large municipal customers are currently asking PSE to convert
15 their existing street lights to energy efficient LED luminaires, and have expressed
16 interest in smart street light controls. This presents an ideal time to install smart
17 street light controls to further improve our customers' experience while increasing
18 our operational cost efficiencies. In fact, several municipalities have already
19 installed, or are planning to install, smart street light controls on their own street
20 light systems, such as Bellingham, Redmond, and Federal Way.

1 **Q. What are the anticipated benefits of deploying a smart street light control**
2 **service?**

3 A. The primary benefits to a customer of a smart street light control service is that it
4 could provide for meter-grade power consumption measurement, which will,
5 when connected to PSE's billing system, allow PSE to transition away from
6 modeled flat rate wattage billing. That, coupled with enhanced efficiency
7 controls, such as offering a variety of dimming profiles on controlled street lights,
8 could help PSE and its customers better manage the energy performance of its
9 street lighting system.

10 In addition, the operational benefits of a smart street light control service will
11 result from reduced truck rolls, fewer street light outage calls, and improved asset
12 management, which will reduce operating expenses over time.

13 **Q. Has PSE already advised the Commission regarding the smart street lighting**
14 **service?**

15 A. PSE detailed in Docket UE-171047 that it would test various smart street lighting
16 control and advanced photocell technologies and may propose future tariff
17 schedule modifications, if appropriate.

18 **Q. Has PSE already tested various smart street lighting controls?**

19 A. Yes, in 2017 and 2018, PSE performed five small-scale trials of leading
20 manufacturers' smart street light control solutions on 80 existing LED fixtures in
21 four neighborhoods in partnership with the City of Bellevue. These technology

1 demonstrations allowed PSE to assess ease of installation, system reliability,
2 software interface and user experience, reporting capabilities, and potential
3 integration options with PSE's existing enterprise-wide systems.

4 **Q. What are the next steps regarding the smart street lighting service?**

5 A. PSE is conducting an RFI with leading manufacturers to better understand
6 hardware and system capabilities, costs, and references of current installations.

7 **Q. When might PSE implement a smart street light control service?**

8 A. If resource capacity is sufficient to deploy a smart street light control service, PSE
9 could submit a modified or new tariff schedule to the Commission for
10 consideration after the successful completion of the 2019 general rate case.

11 **Q. When would the expense for a smart street light control service cost accrue,
12 and how would those costs be recovered?**

13 A. If a modified or new tariff schedule for smart street light control service was
14 approved by the Commission, the initial costs would cover IT integration and
15 configuration of consumption data with PSE's existing billing engine. If the
16 technology selected required hardware and software to be deployed to establish a
17 secure communication network, those costs would also accrue. Both of these
18 expenses would likely come in year one. All cost for smart street light control
19 node hardware/software and reoccurring network communication and software as
20 a service fees for the smart street lighting central operating platform would accrue

1 in the year deployed/used. These costs would be incorporated and recovered in
2 rates through subsequent general rate case filings.

3 **Q. How might existing tariff schedules be modified to account for a smart street**
4 **light control service?**

5 A. A smart street light control service rate would include a flat service rate based on
6 luminaire wattage, and a variable energy rate based on metered kWh consumption
7 per luminaire. Any cost for smart street light control node hardware/software, any
8 accompanying communication hardware/software, and IT cost to integrate and
9 configure any consumption data with PSE's existing billing engine, would be
10 included in the flat service rate based on luminaire wattage. A variable kWh cost
11 for energy and demand charges would be applied based on metered consumption
12 per luminaire. Additionally, depending on the performance management
13 expectations of PSE's customers, optional flat service fee(s) could be offered to
14 provide for the application and management of diverse dimming profiles, system
15 visibility, or reporting capabilities.

16 **D. Customer-Sited Energy Storage Demonstration Project**

17 **Q. What is the Customer-sited Energy Storage Demonstration (the "CSES**
18 **Demo") project?**

19 A. The CSES Demo project is a proposed pilot service where PSE will design,
20 deploy, and operate various small-scale projects to better understand distributed

1 energy storage technology, including battery energy storage systems (“BESS”),
2 and validate potential utility and customer benefits.

3 The intent of the CSES Demo is to provide PSE personnel the opportunity to learn
4 about and gain experience with distributed BESS vendors, technology, and
5 operations. Through the CSES Demo, PSE expects to incrementally build best
6 practices in standards, processes, and operations that better prepare PSE for a
7 modernized grid that provides customers with more options for safe, reliable, and
8 flexible services, as discussed in the Prefiled Direct Testimony of Booga K.
9 Gilbertson, Exh. BKG-1T. Further, the best practices established through the
10 CSES Demo will be necessary precursors to developing a customer product or
11 service with intended grid benefits.

12 **Q. Why is PSE planning the CSES Demo project?**

13 A. Customers, including municipal, commercial, and residential, are increasingly
14 interested in the potential for distributed energy resource (“DER”) technology and
15 related services, including BESS. Further, PSE’s peers and colleagues in
16 Washington are increasingly seeking alternative solutions to ensure the services
17 and reliability of the local distribution grid. While still a developing technology,
18 both in capability and affordability, it is important that PSE develop critical
19 learning and experience, as well as organizational standards and processes, that
20 enable a long-term vision for leading and supporting energy storage technology
21 adoption and deployment.

1 **Q. What will the CSES Demo project do?**

2 A. The CSES Demo will assess the crowded marketplace of DER solution providers
3 in order to evaluate different combinations of brand, technology, and capability.
4 With limited prior BESS project experience, PSE will partner with experienced
5 vendors to accelerate learning and experience that can enhance the performance
6 of demonstration projects on a customer's behalf. Further, partnership with
7 experienced vendors will mitigate risks in the trial of new technology and service
8 models by PSE, ensuring that reliable services and safety are maintained and that
9 intended demonstration results are better realized.

10 By evaluating a broad range of operation, use case, and performance metrics for
11 distributed BESS technology, the CSES Demo will identify the best models of
12 service and support that PSE can provide to customers interested in distributed
13 BESS technology. The use of a central operating platform to remotely monitor
14 and control a fleet of distributed BESS will create additional options for
15 increasing grid services and resiliency.

16 **Q. How does PSE intend to deploy the CSES Demo?**

17 A. Under the CSES Demo, PSE will remotely monitor and control BESS via secure
18 wireless networks that will communicate with an operating platform and optimize
19 performance. The CSES Demo includes multiple lithium-ion energy storage
20 projects with different scales of deployment to better evaluate different models for
21 customer adoption, interaction, and benefit; these deployments will include:

1 **Residential CSES Demo** – PSE’s residential project will deploy a half a dozen
2 behind-the-meter (“BTM”) BESS, paired with critical load panels, to evaluate
3 how the systems provide backup power and reliability. The BESS installations
4 will be funded, owned, and maintained by PSE and located at the residences of
5 PSE employees, or close relatives, in order to evaluate and understand
6 installation, design and operating considerations for support of future customers’
7 BTM BESS adoption.

8 **Commercial CSES Demo** – PSE’s commercial project will deploy one BTM
9 BESS at a PSE service building, replicating a commercial customer, with a
10 primary purpose to show the potential for demand charge reductions based on
11 managing the building’s peak demand. The BESS will be maintained by PSE and
12 PSE will evaluate the BESS performance of different use cases and operating
13 constraints.

14 **Community CSES Demo** – PSE’s community project will deploy one grid-side
15 BESS in a residential neighborhood with a high occurrence of customer-owned
16 roof-top solar photovoltaic (“PV”) technology with a primary purpose to provide
17 better reliability and integration of excess solar PV electricity back-fed to the grid.
18 The BESS will be funded, owned, and maintained by PSE in order to closely
19 evaluate the customer experience during installation and demonstration, as well as
20 the design and operating conditions that continue to support net metering and
21 customer adoption of roof-top PV technology.

1 **Q. What are the next steps and anticipated schedule regarding the CSES Demo**
2 **project?**

3 A. Operation, testing, and performance of the residential, commercial, and
4 community projects will inform a subsequent feeder-level project, including
5 increasing the scale and complexity of distributed BESS technology deployment
6 and control by a central operating platform. The feeder-level project will evaluate
7 the potential for grid-scale services, in addition to further refinement of services
8 to customers, as well as integrate the central operating platform with PSE's
9 transition to Smart Grid and the use of an advanced distribution management
10 system. The feeder-level project will continue to support PSE's evaluation and
11 understanding of the cost of distributed BESS technology, as well as the measure
12 and value of benefits and services provided.

13 The Residential CSES Demo and Commercial CSES Demo projects are scheduled
14 to be fully installed and commissioned by the end of summer 2019. Plans for
15 operation, maintenance, safety, and support will be finalized ahead of operation.

16 PSE is working to identify a site for the Community CSES Demo. PSE is
17 particularly interested in locations with a high rate of adoption of roof-top PV
18 solar generation by customers, as well as where PSE is potentially seeking further
19 improvement to grid reliability. PSE aims to recommend a site by the end of
20 summer 2019, and the project provides additional opportunity for PSE to learn
21 how location, DERs, grid controls and equipment can integrate to communities
22 and impact the system cost and benefits.

1 **E. Community Solar Product**

2 **Q. Please describe PSE's community solar product.**

3 A. PSE is evaluating offering a community solar product that would allow customers
4 to support the development of specific small-scale solar projects in PSE's service
5 territory, sharing in the costs and benefits of those installations. Participating
6 customers would either make an upfront purchase or pay a monthly fee to
7 participate, covering the cost of the solar energy and product administration. They
8 would also receive a credit based on the benefit of the solar generation associated
9 with their share of the project for the duration of their participation purchasing the
10 product.

11 **Q. Why is PSE considering a community solar product?**

12 A. Interest in renewable energy is strong in PSE's service territory. Net metered solar
13 installations have grown dramatically and participation in voluntary renewable
14 products (Schedule 135 – Green Power/Solar Choice; Schedule 136 – Large
15 Volume Green Power; Schedule 139 – Green Direct and Schedule 137 Carbon
16 Balance), continues to increase as well.

17 Additionally, PSE customers have expressed interest in community solar
18 specifically. However, many customers who are interested in supporting local
19 renewables are unable or unwilling to install rooftop solar due to a variety of
20 factors including but not limited to renting property, upfront cost, credit quality,
21 roof age, and shading. They view community solar as an attractive alternative.

1 Community solar also gives PSE the option to site projects in areas that minimize
2 negative grid impacts.

3 **Q. How does community solar differ from PSE's existing Solar Choice and**
4 **Green Power products (Schedule 135)?**

5 A. Community solar differs from PSE's existing Solar Choice and Green Power
6 products (Schedule 135) in that it bundles the purchase of solar energy and
7 renewable energy credits. Depending on the details of product design, community
8 solar participants may have the potential to see net savings over the life of their
9 participation purchasing the product, similar to how the owners of rooftop solar
10 installations can break even on the initial investment due to avoided energy
11 purchases and state incentives.

12 **Q. What are the next steps regarding community solar?**

13 A. PSE is working to identify sites for solar projects to support community solar.
14 PSE is particularly interested in locations with a strong community partner who is
15 interested in serving as a site host, as well as locations where solar has the
16 potential to provide grid benefits, such as on summer peaking circuits. PSE
17 community solar projects could also offer an opportunity for PSE to learn more
18 about how location and smart controls (smart inverters, curtailment/dispatch of
19 solar, co-location with energy storage, etc.) impact the system costs and benefits
20 associated with distributed solar projects through a real-world test.

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After developing cost estimates and assessing market size, PSE will evaluate the viability of offering a community solar product.

V. CONCLUSION

Q. Does this conclude your direct testimony?

A. Yes.