Portland General Electric
121 SW Salmon Street • Portland, OR 97204
portlandgeneral.com

April 7, 2022

Public Utility Commission of Oregon
Attn: Filing Center
201 High Street S.E., Suite 100
P.O. Box 1088
Salem, OR 97308-1088

RE: Advice No. 22-05, Schedule 200 Dispatchable Standby Generation Update

Portland General Electric Company (PGE) submits this filing pursuant to Oregon Revised Statutes 757.205 and 757.210, and Oregon Administrative Rule 860-022-0025, for filing proposed tariff sheets associated with Tariff P.U.C. No. 18, with a requested effective date of **June 1, 2022**:

Second Revision of Sheet No. 200-1
Second Revision of Sheet No. 200-2
Second Revision of Sheet No. 200-3
Original Sheet No. 200-4

In 2021, Oregon's Legislature passed House Bill 2021 (HB 2021) the Clean Energy Targets bill, requiring electricity providers to rely on non-emitting electricity and eliminate greenhouse gas emissions associated with serving Oregon retail electricity consumers by 2040, in a way that also provides the additional direct benefit of resiliency. One way PGE can begin to meet the policy goals set out in HB 2021 is revise existing tariffs to include non-emitting electricity resources. PGE seeks to revise Schedule 200 Dispatchable Standby Generation (DSG) to include language to accommodate Battery Energy Storage Systems when contracting with Large Nonresidential Customers for the purpose of providing grid services and averting situations that could lead to power quality problems for the power supply in PGE's service territory. PGE is also concurrently seeking to update Schedule 26 Energy Partner tariff to add additional options for Non-Emitting Dispatchable Resources through a separate advice filing.

It has been several years since PGE has revised its Schedule 200 DSG tariff, PGE is including the following updates which add clarity and brings the Schedule 200 DSG tariff language in line with PGE's other tariffs. PGE has added a Definitions section, replaced the term "generator" for "Generation Resource", replaced the term "Funding Level" with "Aid in Construction Allowance" which now provides a detailed description of what PGE will contribute to enable the Customer's Generation Resource(s) to run parallel with the Company's system.

The Funding Level is based on $39.50 per nominated kW year for Ancillary Services only or $82.40 per nominated kW year for participating in both Demand Response and Ancillary Services. Finally, PGE has updated the Special Conditions to include the dollar amount limit the Company will reimburse the Customer for any permits specifically required for this service annually and has removed language that required PGE to provide a minimum of 24 hour notice by telephone, fax, or e-mail before starting the generator for the Company's purposes to align with operational practices.

Attachment A is an overview document of PGE's Non-Residential Energy Storage Tariff Filings which describes in more detail PGE's proposed updates to Schedule 200 DSG and PGE's overall Non-Residential Energy Storage strategy.

Work papers detailing the calculation of the nominated kW year for Ancillary Services and per nominated kW year for Demand Response and Ancillary Services participation are attached.

A redline of Schedule 200 is attached as a courtesy.

To satisfy the requirements of OARs 860-022-0025(2), PGE provides the following response:

The changes do not increase, decrease, otherwise change existing rates, or impact revenues.

Please direct questions or comments regarding this filing to Chris Pleasant at (503) 464-2555. Please direct all formal correspondence and requests to the following email address pge.opuc.filings@pgn.com

Sincerely,

\s\ *Robert Macfarlane*

Robert Macfarlane
Manager, Pricing & Tariffs

Enclosures

PGE Advice No. 22-05
Schedule 200 Dispatchable Standby Generation Update

Work Papers
Provided in Electronic Format

SCHEDULE 200
DISPATCHABLE STANDBY GENERATION

PURPOSE

To provide the Company with additional generation capacity by contracting with Large Nonresidential Customers for the right to operate their Generation Resource(s) for the purpose of providing Grid Services and averting situations that could lead to power quality problems for the power supply in the local region. (C) (C)

AVAILABLE

In all territory served by the Company.

APPLICABLE

To Large Nonresidential Customers with 250 kW or greater of permanently installed Generation Resource(s) in place or planned for installation within 24 months. (C) (C)

DEFINITIONS (N)

Aid in Construction Allowance - The amount of funding PGE may contribute to an individual project to enable the Generation Resource to be integrated with PGE for dispatch to support Grid Services.

Ancillary Services - Includes Contingency Reserve and Frequency Response for the purposes of this program.

Battery Energy Storage System (BESS) - An electrochemical device that charges (or collects energy) from the grid or on-site power generation sources and then discharges that energy at a later time to provide electricity or other grid services when needed.

Contingency Reserve - The ability to dispatch an enrolled Generation Resource in response to a critical need for replacement power in the region.

Demand Response - The dispatch of a qualified enrolled Generation Resource for the purpose of strategically reducing energy usage during times of peak demand and/or high energy market pricing.

Dispatchable Standby Generation Agreement (Agreement) - An agreement between the Company and Customer that defines the length of the Agreement, amount of capacity nominated to PGE, number of hours PGE may dispatch the Generation Resource, the terms of the Customer's usage of the Generation Resource, and amount of the Aid in Construction Allowance.

Frequency Response - An immediate reduction of site load or dispatch of power at a predetermined level for a short duration in response to a disruption that causes the frequency of the electrical system to fall below a nominal 60 hertz (Hz). (N)

SCHEDULE 200 (Continued)

DEFINITIONS (Continued) (N)

Generation Resource - An Internal Combustion Generator or a Battery Energy Storage System integrated with PGE pursuant to this Schedule.

Grid Services - For the purposes of this Schedule includes the dispatch of Generation Resources for Ancillary Services or Demand Response.

Internal Combustion Generator - A mechanical engine used to generate electricity.

Reserve Status - Indicates a resource is available for dispatch by PGE. (N)

CUSTOMER RESPONSIBILITIES (M)

The Customer will grant the Company access to its Generation Resource(s) such that the Company can operate the Generation Resource(s) at the site or remotely operate the Generation Resource(s) in parallel with the Company's distribution system. (C) (C)

The Customer may operate the Generation Resource(s) at the site as specified in the Dispatchable Standby Generation Agreement (Agreement). (C) (C)

COMPANY RESPONSIBILITIES

The Company will conduct an analysis of the Customer's Generation Resource and develop a cost estimate for the installation of the equipment necessary for participation under this schedule. The Company will be responsible for providing engineering and funding based on the cost estimate not to exceed the Aid in Construction Allowance. The Company will pay for and own all communications and metering equipment. (C) (C) (C)

The Company will normally pay for all fuel used to operate the Customer's Internal Combustion Generator (s) throughout the term of the Agreement. To the extent the Customer operates the Internal Combustion Generator(s) more than 15 (fifteen) hours per operating year during non-outage periods, the Customer shall be responsible for paying fuel costs, per the Agreement. (C) (C)

In, addition, the Company is responsible for routine maintenance as described in the Agreement. The Company will perform regular testing of the Customer's Generation Resource(s) and control system and testing of the Company's dispatch control and interconnection facilities. The Company will provide power quality monitoring and data reporting of the Customer's facility and Generation Resource(s). (C) (C) (C)

The Company's design will be such that during outage situations, the Customer's Generation Resource(s) will automatically start and provide backup power to the Customer. (C) (C) (M)

SCHEDULE 200 (Continued) (T)

AID IN CONSTRUCTION ALLOWANCE (C)(M)

The Company's Aid in Construction Allowance is based on the cost of Company owned equipment necessary for parallel operations, system protection, safety provisions and communications, related administrative costs and the Generation Resource and switchgear modifications, wiring and conduit necessary to permit Customer's Generation Resource(s) to run in parallel with the Company's system. (C) (C) (C)

PGE shall contribute $39.50 per nominated kW year for Ancillary Services, or $82.40 per nominated kW year for participating in both Demand Response and Ancillary Services. Only BESS resources are eligible to participate in Demand Response. The Customer will be responsible for cost components that bring the total project costs above the Company's Aid in Construction Allowance. Due to the individual nature of each Generation Resource, specifics on Company Funding and Customer payment responsibilities will be contained in the Agreement. (C) (C)

Upon termination of the Agreement, the Company may remove its equipment. (T)

SPECIAL CONDITIONS

1. The Customer's charges for Electricity Service under any of the Company's Standard Service or Direct Access Service schedules are not changed or affected in any way by service under this schedule and are due and payable as specified in those schedules.

2. Parallel operation of Generation Resources must satisfy Company interconnection requirements. (C)

3. The Customer will ensure that the Generation Resource(s), communications equipment, switchgear and metering equipment are accessible to the Company at all times. (C)

4. Prior to receiving service pursuant to this schedule, the Customer and the Company must enter into a written Agreement, signed by the Customer. (C) (C)

5. The Customer must obtain all required permits prior to service initiation to allow all planned operations as specified in the Agreement. The Company will reimburse the Customer for any permits specifically required for this service, including permit renewals during the term of the Agreement up to $10,000 annually. (C) (C)(M)

SCHEDULE 200 (Concluded)

SPECIAL CONDITIONS (Continued)

6. The Company may operate the Generation Resource(s) at any time without notice when the Generation Resources are placed on Reserve Status. When advance notice is possible, PGE will notify the Customer as specified in the Agreement. **(C)(M)** **(C)**

7. Customers receiving service under this schedule will agree to an initial multi-year term for the Agreement, with options to renew. Should the Customer terminate the Agreement before the end of the initial term, the Customer will reimburse the Company for a portion of the capital investment plus a removal fee as specified in the Agreement. **(C)** **(C)(M)**

8. The customer is responsible for maintaining the nominated capacity of the BESS, the details of which are described in the Agreement. **(N)** **(N)**

9. PGE may request that the Customer allow PGE to use the Generation Resource(s) in Reserve Status. The decision to allow PGE to use the Generation Resource(s) for any given period of time in Reserve Status is up to the Customer, as specified in the Agreement. **(C)(M)** **(C)**

10. The Company will have the right to refuse to fund projects for any reason; including, but not limited to projects deemed high-risk, not cost effective, of poor equipment quality, or an excessive environmental risk. Reasons for funding denial will be provided in writing to the Customer upon request. **(T)** **(M)**

PGE Advice No. 22-05
Schedule 200 Dispatchable Standby Generation Update

Courtesy Redline

SCHEDULE 200
DISPATCHABLE STANDBY GENERATION

PURPOSE

To provide the Company with additional generation capacity by contracting with Large Nonresidential Customers for the right to operate their Generation Resource ~~standby or backup generator~~(s) for the purpose of providing Grid Services and averting situations that could lead to power quality problems for the power supply in the local region.

AVAILABLE

In all territory served by the Company.

APPLICABLE

To Large Nonresidential Customers with 250 kW or greater of permanently installed Generation Resource(s) ~~standby or backup generation capacity~~ in place or planned for installation within 24 months.

DEFINITIONS

Aid in Construction Allowance - The amount of funding PGE may contribute to an individual project to enable the Generation Resource to be integrated with PGE for dispatch to support Grid Services.

Ancillary Services - Includes Contingency Reserve and Frequency Response for the purposes of this program.

Battery Energy Storage System (BESS) - An electrochemical device that charges (or collects energy) from the grid or on-site power generation sources and then discharges that energy at a later time to provide electricity or other grid services when needed.

Contingency Reserve - The ability to dispatch an enrolled Generation Resource in response to a critical need for replacement power in the region.

Demand Response - The dispatch of a qualified enrolled Generation Resource for the purpose of strategically reducing energy usage during times of peak demand and/or high energy market pricing.

Dispatchable Standby Generation Agreement (Agreement) - An agreement between the Company and Customer that defines the length of the Agreement, amount of capacity nominated to PGE, number of hours PGE may dispatch the Generation Resource, the terms of the Customer's usage of the Generation Resource, and amount of the Aid in Construction Allowance.

Frequency Response - An immediate reduction of site load or dispatch of power at a predetermined level for a short duration in response to a disruption that causes the frequency of the electrical system to fall below a nominal 60 hertz (Hz).

SCHEDULE 200 (Continued)

DEFINITIONS (Continued)

Generation Resource - An Internal Combustion Generator or a Battery Energy Storage System integrated with PGE pursuant to this Schedule.

Grid Services - For the purposes of this Schedule includes the dispatch of Generation Resources for Ancillary Services or Demand Response.

Internal Combustion Generator - A mechanical engine used to generate electricity.

Reserve Status - Indicates a resource is available for dispatch by PGE.

CUSTOMER RESPONSIBILITIES

The Customer will grant the Company access to its ~~generation~~ Generation Resource(s) such that the Company can operate the ~~generator~~ Generation Resource (s) at the site or remotely operate the ~~generator~~ Generation Resource (s) in parallel with the Company's distribution system.

The Customer may operate the ~~generator~~ Generation Resource (s) at the site as ~~needed for a limited number of hours per year, as~~ specified in the Dispatchable Standby Generation Agreement (Agreement)~~service agreement~~.

COMPANY RESPONSIBILITIES

The Company will conduct an analysis of the Customer's ~~generator project~~ Generation Resource and develop a cost estimate for the installation of the equipment necessary for participation under this schedule. The Company will be responsible for providing engineering and funding based on the cost estimate not to exceed the Aid in Construction Allowance ~~Funding Level for the installation of the equipment necessary for participation in the program.~~ The Company will pay for and own all communications and metering equipment.

~~In addition, the Company is responsible for routine maintenance .~~ The Company will normally pay for all fuel used to operate the Customer's Internal Combustion Generator (s) throughout the term of the ~~service a~~ Agreement. To the extent the Customer operates the Internal Combustion Generator(s) more than 15 (fifteen) hours per ~~Operating~~ operating ~~Year~~ year during non-outage periods, the Customer shall be responsible for paying fuel costs, per the ~~Dispatchable Standby Generation (DSG) a~~Agreement.

In, addition, the Company is responsible for routine maintenance as described in the Agreement. The Company will perform regular testing of the Customer's Generation Resource ~~generator~~(s) and control system and testing of the Company's dispatch control and interconnection facilities. The Company will provide power quality monitoring and data reporting of the Customer's facility and Generation Resource(s)~~generator system~~.

The Company's design will be such that during outage situations, the Customer's Generation Resource ~~generator~~(s) will automatically start and provide backup power to the Customer ~~for as long as needed~~.

SCHEDULE 200 (Continued ~~Concluded~~)

~~FUNDING LEVEL~~AID IN CONSTRUCTION ALLOWANCE

The Company's ~~Funding Level~~ Aid in Construction Allowance is based on the cost of Company owned equipment necessary for parallel operations, system protection, safety provisions and communications, related administrative costs and the Generation Resource ~~generator~~ and switchgear modifications, wiring and conduit necessary to permit Customer's Generation Resource ~~generator~~(s) to run in parallel with the Company's system.

PGE shall contribute $39.50 per nominated kW year for Ancillary Services, or $82.40 per nominated kW year for participating in both Demand Response and Ancillary Services. Only BESS resources are eligible to participate in Demand Response. The Customer will be responsible for ~~unique~~ cost~~s~~ components that bring the total project costs above the Company's Aid in Construction Allowance~~Funding Level~~. Due to the individual nature of each ~~project~~ Generation Resource, specifics on Company Funding and Customer payment responsibilities will be contained in the ~~service~~ ~~a~~Agreement.

Upon termination of the ~~a~~Agreement, the Company may remove its equipment.

SPECIAL CONDITIONS

1. The Customer's charges for Electricity Service under any of the Company's Standard Service or Direct Access Service schedules are not changed or affected in any way by service under this schedule and are due and payable as specified in those schedules.

2. Parallel operation of Generation Resources~~generators~~ must satisfy Company interconnection requirements.

3. The Customer will ensure that the Generation Resource ~~generator~~(s), communications equipment, switchgear and metering equipment are accessible to the Company at all times.

4. Prior to receiving service ~~on~~ pursuant to this schedule, the Customer and the Company must enter into a written ~~service~~ A~~a~~greement, signed by the Customer.

5. The Customer must obtain all required permits prior to service initiation to allow all planned operations as specified in the ~~service~~ A~~a~~greement. The Company will reimburse the Customer for any permits specifically required for this service, including permit renewals during the term of the ~~service~~ A~~a~~greement up to $10,000 annually.

SCHEDULE 200 (Concluded)

SPECIAL CONDITIONS (Continued)

6. The Company may operate the Generation Resource ~~generator~~(s) at any time without notice when the Generation Resources are placed on Reserve Status. When advance notice is possible, PGE will notify the Customer as specified in the Agreement. ~~and will notify the Customer by telephone, fax or e-mail a minimum of 24 hours before starting the generator(s) for the Company's purposes. Notice is deemed given when the Customer confirms notice either verbally or by e-mail.~~

7. Customers receiving service under this schedule will agree to an initial multi-year term for the ~~service A~~agreement, with options to renew. Should the Customer terminate the ~~service A~~agreement before the end of the initial term, the Customer will reimburse the Company for a portion of the capital investment plus a removal fee as specified in the ~~service A~~agreement.

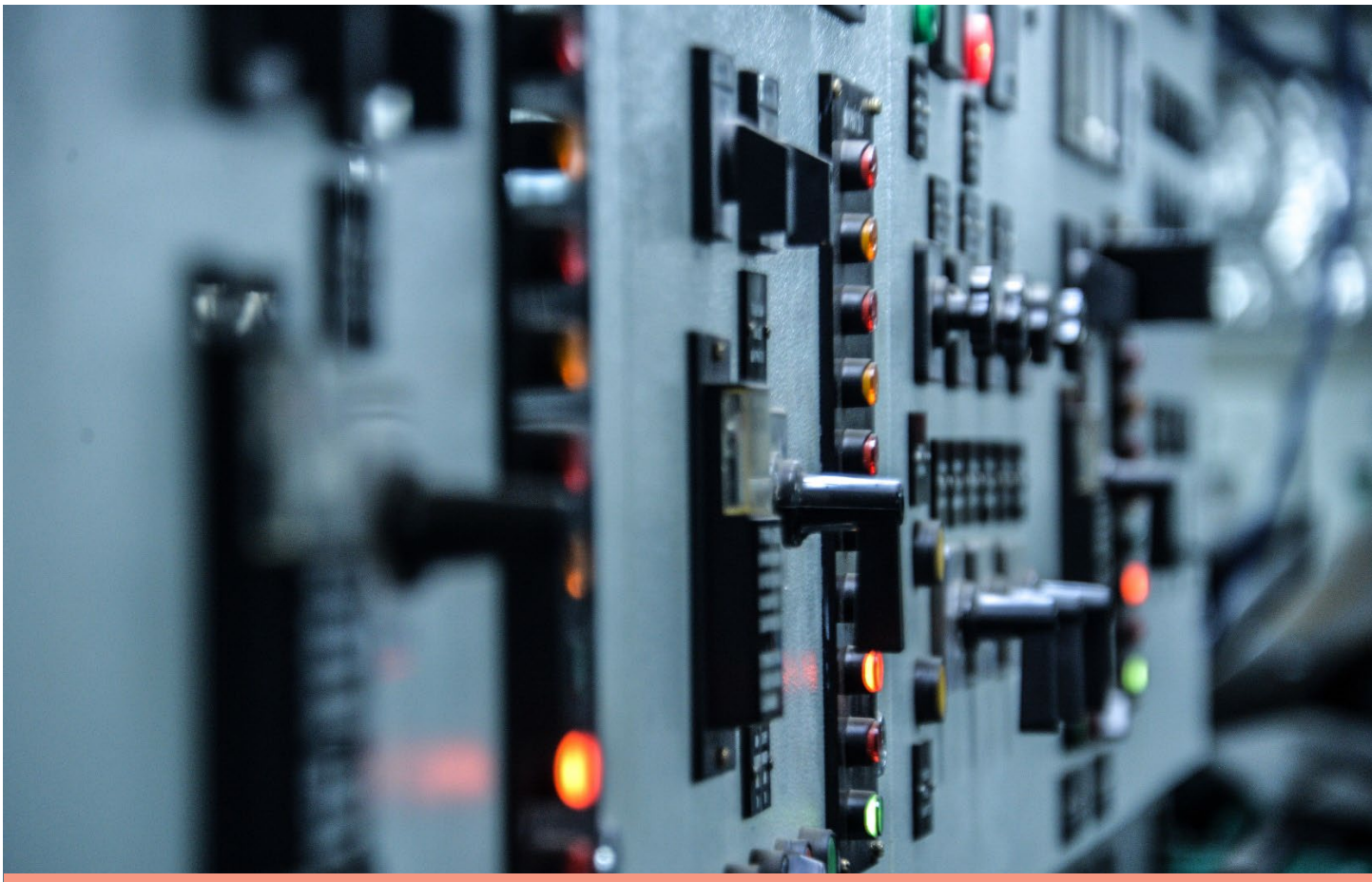
~~7.~~8. The customer is responsible for maintaining the nominated capacity of the BESS, the details of which are described in the Agreement.

~~8.~~9. PGE may request that the Customer allow PGE to use the Generation Resource ~~generator~~(s) in ~~r~~Reserve S~~s~~tatus. The decision to allow PGE to use the Generation Resource ~~generator~~(s) for any given period of time in R~~r~~eserve S~~s~~tatus is up to the Customer, as specified in the ~~DSG~~ Agreement.

~~9.~~10. The Company will have the right to refuse to fund projects for any reason; including, but not limited to projects deemed high-risk, not cost effective, of poor equipment quality, or an excessive environmental risk. Reasons for funding denial will be provided in writing to the Customer upon request.

PGE Advice No. 22-05
Schedule 200 Dispatchable Standby Generation Update
and
Schedule 26 Nonresidential Demand Response Program
aka Energy Partner Update

Attachment A



Non-Residential Energy Storage Tariff Updates April 2022

Contents

I. Overview

This document provides Oregon Public Utility Commission (OPUC) staff (hereinafter "Staff") and related stakeholders an overview of two tariff revision filings: Energy Partner, Rate Schedule 26; and Dispatchable Standby Generation (DSG), Rate Schedule 200. These filings are intended to enable and encourage customer-sited energy storage interconnection. Under the two proposed actions, customer-sited and interconnected energy storage will provide flexible load and other local and bulk grid services.

These proposed updates are informed by learnings from the ongoing work in the following UM 1856 pilots: Beaverton Public Safety Center, Anderson Readiness Center, Port Westward II, and the residential Smart Battery Pilot. PGE continues to actively study and explore co-optimization of battery use-cases and how to more deeply integrate energy storage into utility operations. These learnings will continue to inform the customer programs outlined here. These proposals build upon the successful operation and existing infrastructure of mature customer programs rather than create new stand-alone pilots. Both program enhancements are intended to be cost-effective and scalable.

II. Energy Partner Schedule 26

A. Background

Energy Partner's Schedule 26 is a demand response (DR) program providing incentives to large non-residential customers during seasonal peak time events for reducing their load. The program develops highly customized load curtailment plans that can work with a variety of unique types of businesses. The program currently only provides firm capacity via DR to PGE. These updates hope to expand upon the grid services that Energy Partner may provide PGE, as well as support customers' resiliency and clean energy goals.

As outlined in PGE's Multi-Year Plan[1], the Energy Partner program is mature and meets the Oregon Public Utility Commission (OPUC) criteria for a program. The program is popular with customers, and also stable and cost-effective. With these tariff modifications requested herein, PGE looks to leverage the program and its infrastructure to acquire additional flexible load.

The Energy Partner program is highly customizable and tailored to the needs of participating customers, allowing them to choose the notification period, seasons, time of day for dispatch, and number of hours. Most of the technology a customer uses had been fitting within this traditional program structure, but as more advanced technologies are adopted by customers there is a need to expand the customer options to include "no notice" dispatch, as well as the ability to provide year-round services in a way that benefits PGE's grid. In keeping with the original structure of the program these options do not specify a specific technology, just outline the required capabilities of the technology being used. Battery energy storage is particularly well-suited to participate in the new proposed options.

[1] Direct link to PGE's 2021 Flexible Load Multi-Year Plan available at https://edocs.puc.state.or.us/efdocs/HAD/um2141had16243.pdf, filed under OPUC Docket UM 2141, available at https://apps.puc.state.or.us/edockets/docket.asp?DocketID=22696.

B. Proposed Tariff Updates

1. No Notice Reservation Payments

Non-emitting firm capacity resources are unique in that they may be dispatched rapidly or autonomously with little disruption or impact to the customer's core business. Anticipating the future complexity of a 100% clean energy mix, PGE proposes to allow select resources that are directly dispatchable by PGE to enroll in a new "No Notice" dispatch option, alongside current 18-hour, 4-hour, and 10-minute options. The reservation payments of this new option were created using values with the 2019 IRP calculated to solve for a Total Resource Cost (TRC) of 1.0. The financial workbook outlining the calculations and assumptions is attached as the Energy Partner Workpaper.

2. Grid Support Events

The second major Energy Partner enhancement is the ability for customers to enroll qualified devices that may be automatically dispatched by PGE into what are being referred to as "Grid Support Events." This refers to the ability for firm capacity resources such as battery energy storage to provide year-round contingency reserve and frequency response services. The current payment for opting into this service is $29.38 per nominated kW per year and is calculating using PGE's 2019 IRP valuation for ancillary services. Because frequency response and contingency reserve are in response to emergency or critical events affecting the regional power supply, participating resources must be integrated with PGE for autonomous dispatch and also agree to the potential for year-round use with no advance notice provided. PGE has been operating customer-sited resources for contingency reserve through the DSG program for over twenty years and has the experience and capability in place to implement this service.

Frequency response refers to an injection of power provided to the grid within seconds of receiving a dispatched signal. The frequency of the electrical system must remain at a nominal 60 hertz (Hz). When frequency declines outside of pre-defined bounds due to an unplanned grid disturbance, a qualified resource may respond by immediately feeding energy back on to the system to raise the frequency back to the nominal 60 Hz. Energy storage is particularly effective at providing frequency response, and by using customer-sited resources, PGE can free-up its other existing frequency response resources (mostly hydro-electric power plants) to generate clean energy.

Contingency reserve obligation (CRO) is the second component of the grid support options. The North American Electric Reliability Corporation (NERC) requires PGE to have a minimum of the sum of 3% of load and 3% of generation on hand to rapidly respond to an unexpected loss of generation within PGE's Balancing Authority area [2]. PGE currently maintains a minimum 85 MW of CRO through the DSG program. The DSG program leverages a portfolio of large generators located on customer premises. Integrated energy storage and other firm capacity resources have the potential to decarbonize PGE's CRO resources and avoid the need for additional fossil fuel generators to meet these requirements.

3. Front Loading Payments

The other material change proposed is to allow Energy Partner to front-load reservation incentive payments for select customers. This is intended to help address high upfront capital costs of battery energy storage and other emerging technology. To address the risk of paying for process load reduction that doesn't materialize as originally modeled, this option would only be available for customers enrolling battery energy storage or other highly predictable resources that can be dispatched by PGE. PGE would

[2] NERC. Disturbance Control Standard – Contingency Reserve for Recovery from a Balancing Contingency Event. (Template - Standard (Results Based) (nerc.com)).

monitor customer participation as outlined in the tariff and deduct reservation payments not earned for a month from future energy payments, with the eventual option of recouping the investment if the customer does not participate according to the agreed contract.

Interviews have indicated that the upfront costs of energy storage are a major barrier to adoption for some customers. These customers have indicated a preference for up-front funding over an ongoing revenue stream. Customers will have the option to choose this option or remain with the traditional monthly payment stream.

PGE proposes to only offer front-loading for reservation payments and any elected grid support payments, and continue to provide energy payments only as they are earned. Energy payments are dependent on the number of DR events called by PGE in a given month, and act as a performance incentive for customers[3]. Additionally, the energy payments are updated annually, and PGE does not wish to project these prices for the duration of the agreement with the customer.

PGE will set up a policy document separate to the schedule in which it will set standards for customers to be granted front-loaded payments. This document shall include: 1) credit requirements, 2) an obligatory commissioning test, 3) restrictions on the age of the unit/remaining life of the unit when signing up, 4) and additional requirements such as "commercially viable," "permitted," or "deemed appropriate by PGE engineers," to address Staff concerns about front-loaded payments being provided for non-proven technologies.

4. Stand Alone Storage

Another suggested revision specific to enabling energy storage resources is to allow stand-alone battery resources to export power back to the grid when dispatched by PGE. This is referred to as Special Condition 13 in the tariff revision, excerpted below:

> *Non-Emitting Firm Capacity Resources capable of providing energy capacity in excess of Customer's current site load that are not otherwise eligible for PGE Schedule 203 may receive a bi-directional meter and be credited at the Customer's retail rate of electricity for energy provided to the grid only when dispatched by PGE as part of this schedule. An interconnection agreement and approval by PGE's Interconnection Team is required prior to installation of such bi-directional meter.*

Up to 60% of non-residential behind-the-meter energy storage is installed without paired solar[4], and this revision is intended to enable and encourage customers with energy storage to be able to participate in DR events. This may only be done when dispatched by PGE for grid services and as approved for suitability by PGE Interconnection.

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[3] Energy Payments are determined by the Mid-Columbia Electricity Index, as reported by Powerdex. PGE uses Powerdex for the Annual Update Tariff and the Short-Term Transition Adjustment, and the service has shown to be reliable. Delays with obtaining near-term power prices have been observed, but this does not impact Schedule 26 and the one-year forward outlook.

[4] Barbose, Elmallah, and Gorman. "Behind-the-Meter Solar + Storage: Market data and trends." Berkley Lab, July 2021, available at https://eta-publications.lbl.gov/sites/default/files/btm_solarstorage_trends_final.pdf.

5. Other Enhancements

An addition to the tariff entitled "Measured Energy Output" is intended to allow battery energy storage to utilize onboard inverter metrology to determine DR participation. This eliminates the need for a historical baseline methodology used in unmetered DR resources that had previously eliminated some customers with batteries that do not have predictable site loads.

Finally, a minor wording enhancement in the "Customer Enrollment" section of the tariff was made to allow customers installing new equipment to begin working with PGE on a Grid Services Agreement and to enroll in the Energy Partner program in the design and construction phases, prior to the assignment of a PGE Service Point ID.

C. Projected Uptake

There are currently seven non-residential batteries with a cumulative 200 kW of energy storage that may be eligible to immediately enroll in Energy Partner upon tariff approval. There are an additional two non-residential customers with a cumulative 93 kW in the interconnection queue awaiting completion of their project who would be eligible to participate. If half of this capacity were to enroll in the program in the next twelve months, this would be an additional 150 kW of capacity within the Energy Partner program.

The program team has an advantage in that every customer wishing to install energy storage must complete an interconnection application prior to construction of their project. This provides close to a year of lead time before a new energy storage device has permission to operate and may enroll in Energy Partner. This affords the team time to prepare budgets and allocate resources with a high degree of precision based on the customers in the current queue.

Despite modest projections of near-term uptake, it is very important to get these programs in place at this early stage. Partnership with customers will be critical to achieving PGE's aggressive flexible load and decarbonization goals. Over the next five years PGE's modeling is forecasting an enrollment of 2.87 MW, based on Cadeo's market projections of energy storage uptake within PGE's service territory.

D. Customer Value

The value of Energy Partner to customers has been established through the Multi-Year Plan and customer evaluations, with customers consistently giving high satisfaction scores and indicating they get good value for their effort to participate[5]. The tariff revisions intend to build on this positive customer experience and expand the types of customers eligible to participate. Customers are increasingly coming to PGE for help and advice on how they can partner with PGE on these items, and those discussions have formed the basis and impetus for the revisions herein.

E. PGE Value

Energy Partner is currently a cost-effective resource, and these adjustments will allow additional types of resources to participate and contribute to PGE's flexibility goals. Additionally, PGE has a continued IRP need for contingency reserve and frequency response, and as the Company integrates with additional resources that can provide these services other generation resources currently being used for contingency reserve and frequency response (typically hydroelectric) can be freed up to produce clean, carbon-free power.

[5] Guidehouse, "Energy Partner Schedule 26 Process Evaluation" Internal PGE Report, (Guidehouse, March 2021).

F. Reporting Cadence

In alignment with the Pilot-to-Program transition plan filed with the 2021 Flexible Load Multi-Year Plan[6], PGE will file annual updates with OPUC Staff. The report will include updates on the number of customers and capacity of non-emitting firm capacity resources, performance of these resources, events, cost-effectiveness, and any operational updates of dispatching energy storage resources.

G. Budget Impact

If PGE were to assume that every non-residential customer with energy storage were to enroll at the top level of every option to the full amount allowed, the total impact to the incentive budget impact be $17,000 annually, or 1% of the overall Energy Partner incentives budget. The projected initial uptake does not necessitate incremental program management or other additional labor outside of existing staffing at this time. Rather than revise the current program management contract with the third-party implementation vendor, PGE will handle the bulk of the incremental work internally. Should additional resources be needed to serve these customers, PGE will include them in subsequent budgeting cycles.

H. Operational Readiness

The Energy Partner Program is mature and cost-effective, recently receiving approval to transition from a Pilot to Program. A third-party implementor currently operates much of the traditional program on PGE's behalf, doing sales outreach, customer education, installation of equipment, and incentive processing. Due to the initial projected low uptake of customers with energy storage PGE has opted to not pursue a change-order with the third-party implementor and will onboard customers internally, relying on program staff and grid-edge engineers. PGE will still rely on the third-party for business-as-usual tasks such as processing rebate checks.

The key operational hurdle will be choosing a dispatch software for the energy storage resources. There are multiple options for how PGE can dispatch larger numbers of energy storage devices, and a key milestone will be selecting a single method. Some customer resources may be more similar to residential energy storage and can share the same software as the Residential Smart Battery Pilot, while others will be more similar to DSG in scale and integration strategy. PGE Information Technology is currently conducting an investigation into the various dispatch software currently utilized by PGE programs, as well as reviewing software not currently used, and will be working to make a recommendation for the optimal dispatch strategy for this program. In the meantime, customers with battery energy storage wishing to enroll before this new software is in place may be placed alongside the residential devices, or with the larger DSG devices.

[6] PGE's 2021 Flexible Load Multi-Year Plan available at https://edocs.puc.state.or.us/efdocs/HAD/um2141had16243.pdf.

I. Historical Size of Program

Energy Partner has shown stable growth over the past few years and the capacity has shown to be a cost-effective acquisition of flexible load. As shown in Table 1, the program has grown from 18 summer MW to 27 summer MW over the past few years, with a total spend last year of just over two million, with close to half that cost being paid out as customer incentives.

Table 1Energy Partner Historical Size

	2019		2020		2021	
	Winter	Summer	Winter	Summer	Winter	Summer
MW	12.7	17.6	16.7	18.8	21.9	26.8
Incentives	$791,872		$969,101		$931,541	
Total Cost	$2,657,745*		$4,007,695*		$2,010,784	

* 2019 and 2020 costs represent combined deferred budgets for Schedule 26 and Schedule 25 (Energy Partner Smart Thermostat)

III. Dispatchable Standby Generation Schedule 200

A. Background

In 1999, the MacLaren Youth Correctional Facility became the first PGE customer to enroll their standby generator in the DSG program, a partnership with customers that interconnects generation resources to provide electricity on to PGE's grid when there is a critical need for power in the local region. Since then, the DSG program has grown to 59 sites with a cumulative nameplate generation capacity of 130 MW. While not fuel restrictive, the bulk of this capacity has historically consisted of internal combustion diesel generators, and PGE has started a concerted effort to modernize and decarbonize the program.

As far back as 2014, stakeholders have shown support for the decarbonization and strategic expansion of the DSG program. In the response to PGE's 2014 Smart Grid Plan, Smart Grid Northwest (then called "Smart Grid Oregon") commented:

> *We would like to applaud PGE for its Dispatchable Standby Generation Program with over 100 MW of available distributed energy. We would like to see PGE take this program to the next level. Distributed generation assets are becoming available at increasingly market competitive packages (from residential solar to fuel cells to electric vehicle and station battery storage). We would like to see PGE take strides to effectively accommodate distributed assets in addition to the 500kw and greater generators that have to date been the focus.*[7]

With the increased commercialization of battery energy storage, as well as PGE's successful integration of customer-sited batteries for grid services as demonstrated by the Beaverton Public Safety Center and Anderson Readiness Center, PGE proposes to build upon those capabilities to expand the DSG program to include battery energy storage greater than 250 kW. In addition to contingency reserve and frequency response, customers with battery energy storage may opt to also participate in DR activities, a flexible load service not currently possible with fossil-fueled resources.

B. Proposed Updates

PGE proposes to make targeted modifications to the Schedule 200 tariff to enable the participation of large customer-sited energy storage. The majority of the modifications are to provide language clarity, consistency, and to add definitions for terms (e.g., the legacy tariff refers exclusively to "generators" and batteries are not strictly generators).

The most significant addition to the tariff is the ability for energy storage resources to also participate and be compensated for DR activities in addition to the traditional contingency reserve. This rate will be calculated to be a maximum gross Construction Allowance of $82.40 per nominated kW per year, with only battery energy storage systems able to receive this and participate in DR events. The Construction Allowance covers PGE's communications equipment, any distribution system upgrade, and any equipment installed on the customer's battery necessary to integrate the resource with PGE. Any remaining allowance is provided as a payment to the customer for their participation in the program. The $82.40 payment was calculated as the maximum expenditures to achieve a Total Resource Cost Test (TRC) Benefit-Cost Ratio of 1.0, assuming a customer commitment for a 10-year period. PGE also added pricing for the legacy generator resources where there previously had been none. Please see attached

[7] Direct link to Smart Grid Oregon's response to Portland General Electric's 2014 Smart Grid Plan available at https://edocs.puc.state.or.us/efdocs/HAC/um1657hac142533.pdf, filed under OPUC Docket UM 1657, available at https://apps.puc.state.or.us/edockets/docket.asp?DocketID=18404.

Workpapers: Schedule 200 DSG Internal Combustion Workpaper and Schedule 200 DSG Battery Energy Storage Sys Workpaper.

C. Projected Uptake

Similar to Energy Partner, customer uptake is anticipated to be modest in the short-term, but unlike Energy Partner, a single customer can add multiple megawatts of capacity. PGE is currently aware of one 5 MW project that may opt to enroll a portion of their capacity. Due to long lead times in construction and supply chain PGE does not anticipate additional entrants that we are not already currently aware of. Forecasting capacity in the future can be challenging because of the large scale of these resources, and one large project (such as the 5 MW project the Company is aware of) can quickly skew forward looking forecasts based on a much smaller average size. However, PGE forecasts a total of 22 new customers enrolled in the program over the next five years at an average of 250 kW apiece.

PGE maintains a list of customers that have inquired about resiliency solutions. Likely candidates for this program include large industrial businesses with an economic driver for uninterrupted power and also municipal customers (such as wastewater treatment facilities) with the need for enhanced resiliency. The availability of federal and state funding should supplement and accelerate such projects, many with community benefits.

D. Customer Value

The DSG program is extremely popular. More customers wish to participate than PGE has historically allowed. A diverse set of large customers approach PGE routinely requesting support with resilience, power quality, and environmental goals. These customers include industrial manufacturing, data centers, municipalities, wastewater treatment facilities, hospitals, correctional facilities, distribution centers, university campuses, and schools. There is a clear customer desire for partnership with PGE on energy goals, and PGE believes that by optimizing existing programs and operational infrastructure, we can meet customer needs and achieve PGE's flexible load and decarbonization goals. Cost and the need for technical advice remain a crucial barrier to the adoption of decarbonized resiliency solutions. The DSG program has a proven track record of guiding customers through initial and ongoing resiliency solutions with diesel generators, and is eager and ready to expand the offerings.

To address these first cost-barriers PGE is continuing with the existing DSG structure of paying the customer's Aid-in-Construction once up-front, with no ongoing payment stream. The highly variable nature of these projects and potential for high costs have driven the Aid-in-Construction design, where the total funding amount is set with in the tariff ($82.40 per kW year, in the case of battery participants) for the cost of PGE to interconnect and enroll the customer into the program, with the balance going to the customer as the payment for allowing PGE to use their resource. The Company estimates that about half of the Allowance will be needed to pay for PGE upgrades and communications, and the other half will be delivered to the customer.

E. PGE Value

Contingency reserve and frequency response are crucial elements to enable resilient and reliable electricity, as well as legal requirements for PGE's participation within the Western Electricity Coordinating Council (WECC). Battery energy storage is an extraordinarily effective provider of frequency response and partnering with customers is an effective way to meet these requirements without PGE needing to make the entire investment in these resources. Additional use cases for existing resiliency equipment beyond emergency-only backup generation of a single facility increase the utilization of

existing assets and delivers both economic and environmental benefits. Further, as PGE's system decarbonizes to meet state and company goals, energy storage will become increasingly vital to serve customers with intermittent renewable generation. These resources are also crucial to achieve the IRP goal of having 211 MW of demand response on our system by 2025.

F. Reporting Cadence

Currently, PGE updates the OPUC on the performance of the DSG program through two mechanisms: the IRP process, which details how much program capacity is counted toward our reserve requirements; and within rate cases, to reflect new acquisition of customer resources. PGE will report the number of participating customers, program size, technology mix, and cost-effectiveness when reporting on the DSG program.

G. Budget Impact

The DSG program budget is recovered through general rate cases, and any incremental Construction Allowance and O&M expenses will be added into subsequent rates. Existing program staff and infrastructure will be used to manage and dispatch these resources. PGE does not request additional incremental resources at this time to accommodate the addition of batteries into the DSG program.

H. Operational Readiness

The DSG program has been managed in-house by PGE for over 20 years, and the incremental enrollment, contract processing, and customer payment processing of new energy storage applicants is "business as usual" for the program. The novel elements of introducing battery energy storage to the program portfolio lies in interconnecting the asset to the dispatch software, as well as performing the maintenance on a new type of asset.

I. Historical Size of Program

The DSG Program has been holding steady over the few years, and has deliberately not been expanding its capacity due to a fulfilled need for spinning reserve. After the NERC Reliability Standards eliminated the distinction between spinning and non-spinning reserves, and now separately considers frequency response and continency reserves as independent requirements it expanded the need for the type of contingency reserve provided by this Program. PGE anticipates the size of the program growing as the Company pursues battery energy storage as a flexible load and enrolled contingency reserve resource, as well as less-emitting alternative fuels for the traditional generator program.

Table 2 DSG Historical Size

	2019	2020	2021
MW	125	129	129
Capital	$61,384	$17,368	$7,402
Operational[8]	$1,136,210	$1,084,241	$1,145,444
Total Cost	$1,197,593	$1,101,609	$1,152,845

[8] Staff asked about fuel costs. PGE does not reimburse customers for fuel, rather just handles the refueling of generators directly with bulk contracts. The three-year average (2019-2021) cost of fuel was $7,659 per site. There were 56 sites in 2021.

IV. Market Sizing

Experts project that global energy storage growth will continue on a strong upward trajectory, tripling annually until it reaches one terawatt hour by 2030[9]. PGE's Distribution System Plan[10], projects growth over the next decade, and while since the starting point is currently quite low, the market is projected to grow to 70 customers by 2030, as illustrated in the following table:

Table 3 – Projected Energy Storage within the PGE Service Territory

Metric	Scenario	2022	2023	2024	2025	2026	2027	2028	2029	2030
MW	Low	0.2	0.8	0.8	0.9	1.0	1.6	1.9	2.4	2.7
	Ref	0.3	1.0	1.3	2.1	2.4	3.3	3.7	4.7	5.3
	High	1.1	2.1	2.6	4.3	5.4	8.3	10.4	14.5	17.4
Customers (@ 250 kW / customer)	Low	1	3	3	3	4	6	7	10	11
	Ref	1	4	5	8	10	13	15	19	21
	High	5	8	10	17	22	33	42	58	70

V. Alternatives Considered

In the development of these proposals to incorporate non-residential energy storage as flexible load resources, PGE considered whether to put all energy storage enrollments into only either Energy Partner Schedule 26 or DSG; and whether to develop new stand-alone options for non-residential customers. A separate "bring your own" (BYO) pilot for non-residential customers was eliminated from consideration in favor of using the structure of Energy Partner and making targeted enhancements to that existing program structure. The objective was to implement a more cost-effective solution for customers, with existing infrastructure, program management, incentive fulfillment, and customer familiarity with the Energy Partner program. Customers can also seamlessly participate in DR with a single program and a single set of rules, regardless of the equipment they nominated to reduce energy.

PGE had been separately considering how to decarbonize and modernize the DSG program to continue to fulfill critical operational functions, and the inclusion of energy storage was a natural evolution. While the primary function of DSG is to provide contingency reserves for PGE, it would have made little sense to only utilize an energy storage resource a few times per year and leave it idle during peak energy needs. Nor would the financial incentive using the DSG pricing likely be high enough to encourage a customer to purchase energy storage, which is much more expensive than a diesel generator. Thus, the proposed revisions to the Schedule 200 tariff outlined within this application were created.

As the workstreams for Energy Partner's and DSG's revisions converged, the question arose of whether both options were necessary, or whether customers would not be better served by only one option, as functionally the two tariffs are both trying to achieve the same end: to enable the dispatch of battery energy storage from non-residential customers for grid services. Ultimately the recommendation was to proceed with the updates to both tariffs, as outlined herein.

[9] "Global Energy Storage Outlook H2 2021." Wood Mackenzie, October 2021.

[10] PGE's 2021 Distribution System Plan Part 1 available at https://assets.ctfassets.net/416ywc1laqmd/i9dxBweWPkS2CtZQ2lSVg/b9472bf8bdab44cc95bbb39938200859/DSP_2021_Report_Full.pdf

The Energy Partner tariff provides customers with participation choice by hours, seasons, and advance notification. The DSG program is structured as an "all or nothing" participation, with customers able to nominate large energy capacity (>250 kW) to PGE for continency reserve as well as DR; with select maintenance activities performed by PGE. The maintenance and close monitoring that the DSG program performs on large resources is important because these customer-sited resources are a critical power reliability resource for PGE's energy supply.

Table 4 – Summary of Alternatives Considered

Option	Considerations	Why Not Implemented
All customers within Energy Partner	Benefits of having a single offering for all customers with energy storage	For large installations, the maintenance and close attention the DSG program may give to each customer was thought to be a better option than Energy Partner.
All customers within DSG		The custom nature of Energy Partner is a better fit for smaller resources than the "all or nothing" DSG structure.
New "BYO" Pilot	Stand-alone pilot for customers with non-residential energy storage, developed from the ground-up specifically for battery energy storage (non-residential version of Smart Battery Pilot)	PGE has experience with dispatching energy storage assets (Salem Smart Power Center, Beaverton Public Safety Center, Anderson Readiness Center, Smart Battery Pilot); in addition to mature non-residential offerings that battery energy storage can be added to, ratepayer funds and cost-effectiveness could be optimized by using existing infrastructure and program teams.
New "Resiliency as a Service" Pilot	PGE constructs, operates, and maintains a microgrid for customers, with the portion of the investment above cost-effectiveness repaid by the customer over the life of the asset.	PGE believes that this type of program offering could be valuable to customers to partner with them on their resiliency solutions, however, there currently exist some structural issues that make this type of offering uneconomic. Federal legislation impacting tax credits for energy storage and sources of lower-cost capital may enable PGE to reassess this option in 2022.

VI. Program Updates

Consistent with other customer Programs and Pilots, PGE does not have a prescriptive cadence of when incentives or allowances are updated. Rather, PGE performs evaluations of both programs as outlined in the Reporting section of this document, and proposes to update incentives when it becomes necessary, either due to customer experience, cost-effectiveness, or other metrics that would warrant changes being made to the programs.

Though the incentive and allowance amounts have been calculated for these updates based on the 2019 IRP, it would be impractical to update them with each IRP change. Customers make decisions on participation based on the pricing, and need consistency with what to expect from their participation in programs. Further, operationally to continually be changing programming and implementation to reflect changing prices would add costs and confusion.

VII. Conclusion

With increasingly erratic and extreme weather due to climate change, an increasingly year-round wildfire season, and the threat of a Cascadia subduction earthquake, the imperatives of local resilience, system reliability and decarbonization are critical to PGE and our customers. Battery energy storage and microgrids can support all three goals; accordingly, PGE is seeking to accelerate adoption of these technologies through multiple channels.

The proposed revisions within this filing are focused on customer-owned resources at that customer's site. Flexible load program incentives through Energy Partner and DSG will not fully cover the cost of a microgrid project; many customers, particularly those seeking community resiliency, need additional financial support. PGE intends to ensure customer are aware of additional funding streams, including customer self-direction of the public purpose charge and applying for grant funding.

The Company continues to review additional strategies and business models to meet customer resiliency and clean energy goals. PGE is particularly focused on advancing community resiliency and serving underserved communities, efforts that are being coordinated through the new OPUC processes for Distribution System Plans, Wildfire Mitigation Plans, and Clean Energy Plans. These ideas range from providing small portable batteries to customers with medical needs to distribution-level microgrids that serves a community resilience center and adjoining homes and businesses while providing system capacity. PGE will continue to engage with stakeholders and Commission Staff while monitoring advances in technologies and changing economics to further develop future efforts.