Portland General Electric Company
121 SW Salmon Street • Portland, Oregon 97204
PortlandGeneral.com

March 23, 2017

E-Filed only
puc.filingcenter@state.or.us

Public Utility Commission of Oregon
201 High St. SE, Suite 100
PO Box 1088
Salem, OR 97308-1088

Attn: Filing Center

RE: **Portland General Electric Company – 2017 New Construction Budget Report 18(5)**

Enclosed for filing is Portland General Electric Company's New Construction Budget Report for the 2017 calendar year. This report is being provided per OAR 860-027-0015 and the 2017 OPUC E-Report Filing requirements. No hardcopy will be submitted.

Should you have any questions, please call Darrington Outama, Manager, Corporate Planning at 503.464.2919 or Stefan Brown, Manager, Regulatory Affairs, at 503.464.8937.

Sincerely,

Stefan Brown
Manager, Regulatory Affairs

Encls.

cc: Darrington Outama, PGE

PUBLIC UTILITY COMMISSION OF OREGON
PO BOX 1088, SALEM, OR 97308-1088
PUC.FilingCenter@state.or.us

ELECTRIC COMPANY NEW CONSTRUCTION BUDGET FOR 2017

GENERAL INSTRUCTIONS

1. Each energy utility operating within the State of Oregon and having gross operating revenues of $50,000 or more per year is required to file a New Construction Budget annually on or before March 31st and report information on new construction, extensions, and new additions to property of the utility in accordance with Oregon Administrative Rule 860-027-0015.

2. The New Construction Budget Report should be completed and filed with the Public Utility Commission of Oregon Filing Center. Complete the e-Filing Report Cover Sheet found at http://www.puc.state.or.us/eFiling/eReports/efiling_report_cover_sheet_FM050.pdf. Email both the report and the cover sheet to PUC.FilingCenter@state.or.us, no later than March 31st.

PROJECT NARRATIVE

For major projects (the three largest projects in terms of cost and all projects greater than $10 million) a narrative supplying the following information is required:

1. Project Description: Include a brief technical specification of the project, ownership, if jointly owned, operating date, stage of construction, and other relevant information.

2. Need for the Project: Attach all prepared information documenting the need for the project, including the specific need the project is intended to fill. Economic comparisons with alternatives are to be attached. All the underlying assumptions of the economic analyses are to be specified.

3. Contingencies: Attach a listing of existing or potential future problems which might impact the final cost or successful completion and operation of the project, such as licensing problems, labor difficulties, litigation, etc.

4. Reconciliation with Prior Budget: Each successive year's budget can be expected to reflect differing estimates of project costs as the project progresses. For each major project, prepare a reconciliation with the prior budget's estimates and provide specific reasons for the changes.

In addition, please attach copies of prepared documentation or plans describing generation transmission, and general plant projects exceeding $1,000,000 in total cost and for which construction will commence in the budget year. Information submitted should contain:

1. A Brief Project Description: Include the project function (e.g., production, transmission, distribution, general plant, thermal, hydro, or other), project identification.

2. Location: Include a starting and ending date.

3. Total budgeted cost.

FULL NAME OF ELECTRIC COMPANY

ADDRESS: PO BOX OR STREET NUMBER	CITY	STATE	ZIP CODE

CERTIFICATION: I CERTIFY THAT THE INFORMATION REPORTED IS TRUE AND COMPLETE TO THE BEST OF MY KNOWLEDGE.

SIGNATURE	TITLE	DATE
	SVP Finance, CFO, Treasurer	3-15-17

SCHEDULE B: ELECTRIC COMPANY NEW CONSTRUCTION BUDGET (SYSTEM)	COMPANY: Portland General Electric	BUDGET YEAR: 2017

INSTRUCTIONS

1. REPORT SIZE OF MAJOR PRODUCTION PROJECTS ONLY, AND PERCENT OWNERSHIP, SCHEDULED OPERATING DATES, AND EXPENDITURES REQUIRED TO COMPLETE PROJECT FOR MAJOR PRODUCTION, TRANSMISSION, AND GENERAL PLANT PROJECTS.
2. MAJOR PROJECTS ARE DEFINED AS THOSE PROJECTS HAVING A TOTAL ESTIMATED COST TO COMPLETION EXCEEDING $10 MILLION.
3. UNDER DISTRIBUTION, REPORT SPECIFIC LINE ITEM EXPENDITURES FOR THE BUDGET YEAR ONLY. ALL EXPENDITURES FOR DISTRIBUTION FOLLOWING THE BUDGET YEAR SHOULD BE AGGREGATED FOR THE YEAR AND ONLY TOTAL DISTRIBUTION EXPENDITURES REPORTED FOR THE PERIOD.
4. NON-MAJOR PROJECT EXPENDITURES WITHIN EACH CATEGORY SHOULD BE AGGREGATED AND ONLY THE TOTALS REPORTED.
5. REPORT ALL EXPENDITURES IN THOUSANDS OF DOLLARS.

DESCRIPTION	SIZE	PERCENT OWNERSHIP %	SCHEDULED OPERATING DATE (MO/YR)	EXPENDITURES (B.Y. = BUDGET YEAR; B.Y. + 1 = THE FIRST YEAR AFTER THE BUDGET YEAR, ETC.) PRIOR TO B.Y. [1]	B.Y. [2]	B.Y. + 1 [3]	B.Y. + 2 [3]	B.Y. + 3 [3]	B.Y. + 4 [3]	REQUIRED TO COMPLETE	TOTAL [5]
MAJOR PRODUCTION PROJECTS [4]:											
Beaver: Replace HRSG Superheaters		100%	Dec-17	6,784	6,591	0	0	0	0	0	13,376
Carty Generating Facility		100%	Jul-16	570,246	1,795	0	0	0	0	0	572,041
Port Westward 2 Construction		100%	Oct-18	281,028	724	733	118	0	0	0	282,604
North Fork - Down Stream Migrant Surface Collector		100%	Nov-15	60,872	0	0	0	0	0	0	60,872
West Side Hydro Structural/Reliability Upgrades		100%	Dec-19	14,145	8,478	7,967	8,109	0	0	0	38,699
Hydro Control System Upgrade		100%	Oct-20	1,362	6,148	6,478	2,223	2,420	0	0	18,632
FY: Repower Faraday Units 1-5		100%	Aug-19	638	9,879	38,642	7,374	0	0	0	56,534
NON-MAJOR PRODUCTION PROJECTS [6]					44,183	45,518	46,988	48,427	49,897	0	235,012
TOTAL PRODUCTION PROJECTS				935,074	77,799	99,339	64,814	50,847	49,897	0	1,277,769
MAJOR TRANSMISSION PROJECTS [4]:											
Blue Lake/Gresham - Substation Upgrades		100%	Jun-18	20,517	8,938	2,185	0	0	0	0	31,639
Horizon Phase II Project		100%	Dec-18	2,195	19,018	8,149	0	0	0	0	29,363
Harborton Reliability Project		100%	Jun-20	987	8,844	17,165	142	0	0	0	27,138
NON-MAJOR TRANSMISSION PROJECTS [6]					11,236	11,575	11,949	12,315	12,689	0	59,764
TOTAL TRANSMISSION PROJECTS				23,699	48,036	39,074	12,091	12,315	12,689	0	147,904
DISTRIBUTION (SEE INSTRUCTION 3): [7]											
STATION EQUIPMENT					80,065						
POLES, TOWERS AND FIXTURES					27,776						
OVERHEAD CONDUCTORS AND DEVICES					46,663						
UNDERGROUND CONDUCTORS AND DEVICES					54,843						
UNDERGROUND CONDUIT					1,222						
LINE TRANSFORMERS					8,405						
SERVICES					33,056						
METERS					3,346						
STREET LIGHTING AND SIGNAL SYSTEMS					6,592						
OTHER:					630						
TOTAL DISTRIBUTION				168,214	262,598	247,371	255,360	263,178	271,168		1,467,890
MAJOR GENERAL PLANT PROJECTS [4]:											
2020 Vision Next Wave			Nov-15	84,883	0	0	0	0	0	0	84,883
Customer Touch Points			Mar-18	64,774	38,777	11,976	0	0	0	0	115,528
Portland Service Center Upgrade			Dec-17	23,176	5,889	0	0	0	0	0	29,065
Field Voice Communications System			Dec-17	1,271	42,992	14,502	0	0	0	0	58,765
Bethel to Round Butte Fiber			Dec-19	0	983	5,070	4,325	0	0	0	10,378
Energy Market Readiness			Sep-17	4,442	7,784	0	0	0	0	0	12,226
NON-MAJOR GENERAL PLANT PROJECTS [6]					79,266	80,631	83,235	85,784	88,388	0	417,304
TOTAL GENERAL PLANT PROJECTS				178,547	175,692	112,180	87,560	85,784	88,388	0	728,150
TOTAL NEW CONSTRUCTION BUDGET				1,305,535	571,508	497,965	419,824	412,123	422,142	0	3,621,712

1) Includes cumulative actual expenditures through Budget Year.
2) Budget includes costs that were approved at the October 2016 Board of Directors meeting and tie to the approved 2017 Operating Plan & Budget. These budgets are subject to change with future Board of Directors approval. Does not include Integrated Resource Plan projects that have not begun construction.
3) Based on 2017 forecast with 2018, 2019, 2020, 2021 trended for inflation by Global Insight Chained Price Index - Public Utilities - Nov 2016 with the exception of Major Projects which forecasts at the time of the Operating Plan & Budget was established.
4) Major projects often include work defined in multiple Functional Classes (Production, Transmission, General/Intangible). Major Projects listed under each Functional category have the majority of costs in that category. Each section includes only the actual and budgeted dollars with that classification, with the remainder rolled into the "non Major Project" sections of the other functional categories.
5) Total does not necessarily equal total project cost as projects are broken by Functional category and exclude AFUDC. Full project costs are listed in the Major Project Narrative document.
6) Includes only the non-major projects for the current Budget Year and subsequent four years.
7) Includes the 2017 portion of eight major Distribution projects which are detailed in the Major Project narrative (> $10 million): Blue Lake, Build Rock Creek Substation, T&D Substation Reliability Upgrades, Horizon II McGill Sub, Marquam Sub, SAM UG Cable, and PCB Transformers.

SCHEDULE B: ELECTRIC COMPANY NEW CONSTRUCTION BUDGET (SYSTEM)				COMPANY: Portland General Electric						BUDGET YEAR: 2017	
				EXPENDITURES (B.Y. = BUDGET YEAR; B.Y. + 1 = THE FIRST YEAR AFTER THE BUDGET YEAR, ETC.)							
DESCRIPTION	SIZE	PERCENT OWNERSHIP %	SCHEDULED OPERATING DATE (MO/YR)	PRIOR TO B.Y. (1)	B.Y. (2)	B.Y. + 1 (3)	B.Y. + 2 (3)	B.Y. + 3 (3)	B.Y. + 4 (3)	REQUIRED TO COMPLETE	TOTAL [4]
2017 OPUC Construction Budget B											
Trojan Decommissioning:											
Independent Spent Fuel Storage Installation		67.5%		3,206	3,474	2,739	2,801	2,797	2,865	74,685	20,818
Non-Major Decommissioning Projects		67.5%		0	0	0	0	0	0	3,592	3,580
Total Decommissioning Projects				3,206	3,474	2,739	2,801	2,797	2,865	78,278	24,397

1) Actuals up through December 2016
2) Budget includes costs that are subject to future Board of Directors approval.
3) Based on capital forecast 2018-2021.
4) Total does not necessarily equal total project cost due to timing and expenditures prior to 2016.

Project Narrative
Projects Greater Than $10 Million
(All dollars include Overheads, those with * are Board-approved projects that also include AFUDC)

Title	Start	End	Amount	Notes
PRB PME – Habitat Fund (P22771) (Pelton Round Butte Protection, Mitigation, and Enhancement)	1/1/2005	12/31/2020	$10,649,062	This fund will be used to support resource protection measures for project-related impacts not otherwise covered by specific license conditions, including projects that enhance and improve wetlands, riparian and riverine habitats, and riparian, aquatic and terrestrial species connectivity that may be affected by the continued operation of the project.
Beaver Plant – Replace HRSG Superheaters (P35150)	4/1/2013	12/15/2017	$13,345,444	The Beaver Generation Plant has six Heat Recovery Steam Generators (HRSGs) that were installed in 1978. Due to the age of the HRSGs, major components including the evaporators, economizers, and outlet stack dampers have been replaced over the past 7 years. The replacement of these components has increased their life expectancy by at least 20 years. The HRSGs super heater sections have not been replaced and are experiencing a significant increase in tube leaks. A thorough investigation and assessment of the HRSG super heater tubes was completed in 2009. Combined visual, metallurgical, u-bend tube wall thickness and rotating ultra-sonic tube wall inspections were performed. Over the years the HRSG super heater u bends have suffered extensive external corrosion, primarily when the plant was idle between 1980 and 1989. This external corrosion has significantly decreased tube wall thickness. Because of this degradation, there is now significant risk that the HRSGs will not be able to adequately function in the near future. This project has been revised since its initial creation in 2013 to incorporate scope increases. These include flanged exhaust joint replacement, hot box replacement, blowdown line replacement, access doors to HRSGs, Motor Operated Valve replacement on blowdown lines, and funding for factory acceptance testing. All work is scheduled to complete in 2017.

Project Narrative
Projects Greater Than $10 Million
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Title	Start	End	Amount	Notes
Port Westward 2 Construction (P35205)*	1/01/2013	3/31/2019	$284,247,497	Port Westward Unit 2 is a flexible capacity resource for PGE located adjacent to the existing Port Westward Unit 1, with nameplate capacity of 220 MW. The project consists of twelve state-of-the-art, highly efficient natural gas-fired reciprocating engine-generator sets (Wärtsilä model 18V50SG). The engineering, procurement, and construction (EPC) contractor for the project is Columbia River Power Constructors (a joint venture of Black & Veatch Construction Inc. and Harder Mechanical Contractors Inc.). The equipment purchase agreement (EPA) supplier is Wärtsilä North America. The plant was placed into service in December 2014. The project has approximately $724k in capital in 2017, primarily for gas storage and final payments to Wärtsilä and Columbia River Power Constructors. Additional costs in 2018 and 2019 are associated with the NW Natural North Mist Expansion Project (NMEP), which serves Port Westward II. The targeted in service date for NMEP is March 2019.
Blue Lake/Gresham - System Upgrades (P35329) *	1/1/2014	6/1/2018	$31,903,459	This project will construct the new Blue Lake-Gresham 230kV circuit and the new Blue Lake-Troutdale BPA #2 230kV circuit. It also encompasses rebuilding the Blue Lake 230kV substation yard to a 6-position ring bus and adding new breaker positions at Gresham substation. Antiquated and underrated equipment in the Gresham 230kV yard will be replaced. New fiber communications will be constructed between Blue Lake and Gresham and between Blue Lake and Troutdale BPA.
Build New Rock Creek Substation (P35572)	6/01/2015	3/31/2018	$11,544,603	This project will construct a new substation in Rock Creek. The Bethany substation does not have the capacity to service an additional 17MW of load without exceeding equipment ratings. West Union substation is currently undergoing a rebuild with a goal to market the substation as a high-reliability substation to service large commercial and industrial load north of Hwy 26. In additional, West Union substation will not be able to provide a strong enough source for loads at the east end of the North Bethany area.

Project Narrative
Projects Greater Than $10 Million
(All dollars include Overheads, those with * are Board-approved projects that also include AFUDC)

Title	Start	End	Amount	Notes
CET Install Oracle CC&B/MDM System (P35619)	1/1/2014	6/30/2018	$119,963,227	This is this formal project approval request as part of the Customer Engagement Transformation (CET). CET's largest project is the replacement of the existing Customer Information System, (CIS) with Oracle's Customer Care and Billing (CC&B) software. The CIS is the system of record for all customer and billing information. The project will address PGE's current and future integration and interoperability needs and serve as a platform to enable and support key emerging technology and pricing programs (e.g. peak time rebate, Net Metering, Solar, Electric Vehicle, etc.) in a cost effective manner. Implementing a new fully-integrated CIS will reduce the three legacy billing systems (Power Billing System), Excelergy and Banner) into a single commercially off-the-shelf (COTS) Customer Information System that can perform complex billing, competitive market functions and standard CIS functions.
Construct Marquam Substation (P35679)*	1/1/2014	12/31/2018	$53,034,717	This project will construct Marquam substation with a 12-position 115kV Gas Insulated Switchgear (GIS) breaker and a half bus and 3-50 MVA transformers. Harrison substation will also be reconstructed with a six-position ring bus and 1-28 MVA transformer. The work includes an upgrade to the 115kV bus at Eastport substation and replaces motor operated switches with circuit switchers; upgrades relays at Urban substation; installs and reconfigures 115kV transmission lines to serve the new Marquam and upgraded Harrison substations; installs distribution infrastructure and circuits to serve the existing downtown network system currently served by Stephens substation; and installs associated fiber communications and materials. Stephens substation, currently serving approximately 25 MVA in the core network has old, antiquated, non-standard equipment. The growing South Waterfront area currently served by Urban substation will need additional capacity. There is currently no adequate substation backup plan for network substations (Canyon and Stephens). Marquam substation installation will

Project Narrative
Projects Greater Than $10 Million
(All dollars include Overheads, those with * are Board-approved projects that also include AFUDC)

Title	Start	End	Amount	Notes
				improve on efficiencies by removing non-standard 11kV feeders from the PGE system, providing adequate future backup to the existing core network, and providing future service to the growing South Waterfront district. The Marquam Radial scope will expand Marquam substation to serve new additional load in the South Waterfront. Project infrastructure includes design, materials and construction of two 50 MVA transformers, three metal-clad switchgear, two new capacitor banks, and the vault and conduit system to accommodate future radial feeder getaways. The project also includes the construction of two underground feeders along SW Bond Ave and nearby streets to deliver service to South Waterfront.
Carty Generating Plant (P35769)*	6/1/2013	12/31/2017	$581,935,370	Carty Generating Station is a base load combined cycle gas plant located adjacent to the Boardman Coal Plant, with a nameplate capacity of 441 MW (fired) output. The major equipment for the project will be provided by Mitsubishi, including the 501GAC gas turbine, heat recovery steam generator (HRSG), and steam turbine.
Horizon Phase II Project (P35802)	1/1/2015	12/31/2017	$39,888,211	Additional bulk power transformation in the Hillsboro area is required no later than June, 2018 to accommodate load growth and maintain compliance with the NERC Transmission Planning (TPL) standards. Installing the second 230kV source into Horizon substation eliminates the loss of the entire substation for the loss of a transmission circuit. Project scope includes: Install a second bulk power transformer at Horizon substation. Provide a second source to Horizon substation by constructing a new 4.4-mile 230kV line segment to create a Horizon-St Mary's-Trojan 230kV circuit. Replace underrated equipment at Sunset substation and install a second 115kV capacitor bank for voltage support. Replace relays and associated equipment at St Mary's, Trojan, and Orenco substations to support the Horizon and Sunset upgrades. Perform communication upgrades at multiple sites to increase

Project Narrative
Projects Greater Than $10 Million
(All dollars include Overheads, those with * are Board-approved projects that also include AFUDC)

Title	Start	End	Amount	Notes
				reliability of the communication network. The project total has increased from the prior year due to entering the construction phase.
Portland Service Center Upgrade (P35835)*	6/1/2014	12/31/2017	$28,218,747	This project will upgrade Portland Service Center (PSC) in order to optimize operations and resiliency of the site. PSC is the second largest line center in the PGE service territory and supports the highest density of historical neighborhoods in Portland. The scope includes construction, remodeling, seismic, furniture, IT infrastructure, and temporary lease and relocation costs. In May of 2015 an additional $3.5 million was approved by the Finance Committee of the Board, increasing the total cost of the project to $23.5 (Capital and O&M). The primary drivers of this increase include additional City of Portland requirements (architectural, engineering, and permitting for entire site) and seismic scope changes (foundation and increased labor costs in competitive construction environment in Portland area). The project is anticipated to be approximately $5-$7M over budget due to renovation of the garage.
SAM: Proactive Underground Cable Program (P35908)	1/1/2015	12/31/2019	$56,842,395	The Strategic Asset Management (SAM) program was established to ensure long-term system reliability by identifying asset-related risks in the T&D system, and advocating for risk reduction activities that are optimal in nature, meaning they are specifically focused and have high economic value compared to other work. Underground cable was selected for analysis by PGE due to concerns about the age of the asset class and the possibility that failures could rapidly escalate in the near term. SAM developed an economic life model that examined PGE's cable population (approximately 11,300 conductor miles) and ascertained which sections were most likely to fail. SAM then assessed the consequences of cable failure, identifying sections that have the highest number of customers and/or loading, and thus would

Project Narrative
Projects Greater Than $10 Million
(All dollars include Overheads, those with * are Board-approved projects that also include AFUDC)

Title	Start	End	Amount	Notes
				most negatively impact customers should they fail. From this effort, a prioritized list of advisable, proactive cable projects was developed, consisting of injection or replacement of 203 conductor miles of cable.
Field Voice Communication System (P35938)	6/30/2014	12/31/2018	$62,872,825	This project replaces the transmission & distribution regionally based crew analog radio system that was installed in the mid-1990s with a territory wide digital radio system, which should allow higher quality communications, increased flexibility in dispatching our crews, higher reliability, and increased safety. The project would replace approximately 1200 mobile (vehicle based) and portable (handheld) units.
West Side Hydro Structural/Reliability Upgrades (P35959)	7/1/2015	12/31/2018	$38,985,926	This project provides funding from 2015 to 2018 to enhance the capability of four West Side Hydro Powerhouses and other structures to withstand seismic hazards, improve plant reliability over the duration of the new FERC operating license, and address personnel safety issues during routine and extreme events. The four facilities that are included in the scope of this project are: 1) Sullivan Powerhouse and Facility Improvements 2) River Mill Powerhouse, Gatehouse, and Facility Improvements 3) Faraday Powerhouse Replacement and Facility Improvements 4) Oak Grove Powerhouse and Facility Improvements
PCB Transformer Replacement (P35980)	8/1/2015	9/30/2021	$73,544,400	This project will identify and replace distribution line transformers containing PCBs in critical locations (i.e., locations where a release could cause significant harm to humans, wildlife and/or the environment). This project will meet anticipated changes to PCB regulations and reduce PGE's liability associated with the potential release of PCBs into the environment. The program is a five-year program and includes O&M primarily for analytical testing of equipment PCB concentrations and capital spending for replacement of distribution line transformers that meet the criteria for replacement. Transformer

Project Narrative
Projects Greater Than $10 Million
(All dollars include Overheads, those with * are Board-approved projects that also include AFUDC)

Title	Start	End	Amount	Notes
				loading will also be evaluated in order to verify that the current size is the most efficient for the customer's load characteristics. Replacement transformers will use a natural ester fluid (vegetable oil) which is an operationally superior, environmentally preferred alternative to mineral oil. The budget has gone up since the last report due to identification of additional 1,252 transformers that will need to be replaced.
Harborton Reliability Project (P36039)	7/1/2015	10/31/2020	$41,667,209	The Harborton Reliability Project consolidates the substation equipment into one physical security perimeter, installs a second distribution power transformer, rebuilds the 115kV yard to a breaker-and-one-half configuration, and installs a new breaker-and-one-half 230kV yard with a bulk power transformer. The second distribution transformer provides full transformer redundancy at Harborton substation, which is an electrical island with no ties to other substations. The installation of the bulk power transformer provides redundancy for the existing Rivergate VWR1 transformer from a physically diverse source; and addresses transmission operations constraints in the North Portland area. The project routes five 230kV lines into Harborton substation; this will require the expansion of existing Right of Way and subsequent tree removal in Forest Park. The 115kV system will be reconfigured to reduce exposure and provide a stronger source to the NW Portland area. The 115kV circuits from Harborton to Wacker, from Wacker to Station E, and from Station E to Canyon will be reconductored to provide the necessary transmission capacity. Equipment at Wacker and Station E will also be upgraded due to the additional capacity requirements.
Bethel to Round Butte Fiber (P36100)	11/30/2016	12/31/2019	$10,377,856	The request is for multi-year funding for the installation of All-Dielectric Self Supporting (ADSS) fiber-optics on the existing Bethel-Round Butte 230kV corridor due to the rise in requirements to provide high speed data with high reliability to

Project Narrative
Projects Greater Than $10 Million
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Title	Start	End	Amount	Notes
				all major PGE resources spread in the State of Oregon. This route allows PGE to own and maintain a communications path from PGE's service territory in the Portland/Salem metro area to the Round Butte hydro generation facility near Madras, Oregon. At Round Butte, PGE will interconnect with existing telecom infrastructure in the area.
Hydro Control System Upgrade (P36134)	8/1/2015	10/31/2020	$18,610,248	This multi-year project will upgrade the control systems for generation and fish handling facilities at Pelton Round Butte (PRB) and West Side Hydro (WSH). The new control systems will be integrated to PI (Plant Information system) for archiving and data mining for investigation of off-normal operating conditions. All new and existing cyber assets will be secured, and related Critical Infrastructure Protection (CIP) procedures and documentation will be updated accordingly and remain within the existing compliance framework. This project has a timeline from 2015 through 2019 but it will be approved in two stages: one to engineer and design (2015/2016) and one for procurement and construction (2017/2019).
Energy Market Readiness Project (P36146)	10/01/2015	03/31/2018	$12,839,919	Purchase and integration of software for bidding, settlements, and outage management of transmission and generation that communicate with an independent operator in an organized power market. Project Scope Includes: - Acquisition and implementation of a Bid to Bill system for interacting with an organized market - Acquisition and implementation of an Outage Management and Reporting Tool for interacting with the market operator and reporting to requisite entities - Migration of Generation Operations software to hosted software solution - Development of Business Practices for bidding and settlements with an organized market - Development of Business Practices for reporting

Project Narrative
Projects Greater Than $10 Million
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Title	Start	End	Amount	Notes
				Generation and Transmission outages within the identified functional areas - Development of interfaces between software solution(s) and existing PGE systems and databases - Affects PGE's Power Operations, Risk Management, Generation, Transmission Services, and the Balancing Authority Project Scope Excludes: - Hourly and sub-hourly price forecasting capability - Risk management financial settlement process - Net Scheduled interchange - Day-Ahead bidding
FY: Repower Faraday Units 1-5 (P36167)	11/23/2015	8/31/2019	$56,578,062	PGE has identified many asset management projects to be complete in the next five years that replace equipment or features that are long overdue. This project will make the Faraday Powerhouse a new, modern, reliable powerhouse versus investing money into refurbishing equipment that has exceeded its useful life. The construction on the new unites will also take advantage of the civil work involved with the powerhouse seismic upgrade.
McGill Sub Capacity Additions (36229)	8/1/2016	12/31/2018	$11,085,071	This project will add capacity to the McGill substation. There is one industrial customer that is on both lines and served by the McGill Substation. The customer experienced reliability issues, including two outages in the last year that have cost the customer money. Through this project, PGE is solving an identified customer problem by improving reliability. The project scope will expand the existing 115 kV four breaker ring scheme to eight position breaker and half scheme: Install seven new 115 kV circuit breakers and thirteen 115 kV disconnect switches Install two new 28 MVA transformers. Install two new metalclad switchgears and add 4-3000 KVAR capacitors. Replace existing 20 relays associated with the protection of the two transmission lines (Glisan-McGill 115 kV and Hogan South-

Project Narrative
Projects Greater Than $10 Million
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Title	Start	End	Amount	Notes
				McGill 115 kV) with 8 relays in the following substations: McGill - 4 relays, Glisan -2 relays and Hogan South - 2 relays. Install a new Control House (50'x15'). Install new transmission relay racks, communication relay racks and transfer existing protection scheme to the new control house. Leave the SCADA racks in the existing metalclad switchgear location.
T&D Substation Reliability Upgrades (P36272)	1/1/2017	12/31/2020	$50,997,824	This project targets aging substations and related infrastructure to improve system reliability and safety. In 2017, these projects will be presented before the Capital Review Group (CRG) for authorization individually and on a rolling basis after a Project Manager is assigned, estimates are near a 90% confidence level, the business case has been reviewed based on updated cost assumptions, and the project plan and benefits realization plan is in place and the project has been recommended by the relevant Project Sponsor(s). When Substation Reliability projects come before the CRG individually and are authorized, this blanket budgeting project will be correspondingly reduced. This BUDGET ONLY funding project will be managed and maintained by the Transmission and Distribution Project Office. Project Scope Includes: Projects expected to be presented for budget approval have been identified as stations and equipment at the end of their economic of life, in need of communications/SCADA upgrades, or currently operating in non/standard conditions. There is increasing risk of equipment failures, reducing overall system reliability if these projects are not executed. Substation locations included under this project for 2017 are: Delaware Substation Garden Home Substation King City Substation Silverton Substation St Marys West Substation

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Projects Greater Than $10 Million
(All dollars include Overheads, those with * are Board-approved projects that also include AFUDC)

Title	Start	End	Amount	Notes
				Project Scope Excludes: Projects that are already approved or are have sufficiently detailed designs and estimates to be submitted as standalone projects, and projects that are being driven by increased customer load and/or customer need for high reliability power.

Project Narrative
Projects Greater Than $1.0 Million Starting in 2017
(All costs are fully loaded, excluding AFUDC)

Title	Start	End	Amount	Notes
PW: Install Modular CT Insulation (P35916)	11/21/2016	6/30/2017	$1,125,430	This project proposes a complete redesign of the insulation system on the combustion turbine. The current insulation will be removed and replaced with modular, 3-dimensional shaped insulation blankets that conform to the surface of the combustion turbine, allowing easy removal and reinstallation of the same insulation blankets during turbine inspections. The existing insulation has been removed and reinstalled so many times that the insulation fit-up is no longer adequate. Gaps, in addition to wear and deterioration of the insulation blankets create hot spots that lack barriers for personnel protection against extreme casing temperatures and emit heat to turbine instrumentation, increasing the risk of instrument failure. Deteriorated insulation also increases thermal losses which can result in a change of expansion rates between the combustor section and turbine section of the turbine, compromising turbine reliability. The existing system does not have a step protection system which protects the insulation against damage from personnel ingress and egress in and around the turbine casing.
3WTCPL Upgrade (P36044)	3/1/2017	7/31/2018	$3,348,359	This project will upgrade the 3 World Trade Center Plaza floor. Having identified work groups and their adjacencies on a single floor will contribute significantly to team collaboration, communication, and work group efficiencies. The new sustainable design features better introduction of outside light to work space, energy savings, low emitting workstation components for better indoor air quality, and material from sustainable sources & practices. Project Scope Includes: Open Collaboration spaces, large video conference rooms, medium conference rooms with flat screens and wired for future video conferencing, huddle rooms, large break room, new office furniture that will bring natural light to all employees, creating a more sustainable environment. The new office furniture system supports PGE's direction of a more collaborative work environment.
Tualatin (TCC) Facilities Upgrade (P36052)	1/2/2017	9/30/2017	$1,634,596	This project requests in 2017 to install new furniture at the Tualatin Contact Center so they can accommodate the growth needed to support the CET initiative.

Project Narrative
Projects Greater Than $1.0 Million Starting in 2017
(All costs are fully loaded, excluding AFUDC)

Title	Start	End	Amount	Notes
				Project Scope Includes: Upgrading with furniture, cabling, power. Smaller, more efficient workspace design.
Orient Sub: Capacity Addition (P36166)	8/1/2016	12/15/2018	$5,450,398	The anticipated load growth for the Orient substation service area in the next five years is approximately 5 MVA. Under current configuration the Orient substation transformers BR1 and BR2 are at the risk to load to above 101% and 121% respectively of their nameplate values, and over 90% of their summer winding limits. Transformers that load beyond their winding limits have potential to produce unwanted dissolved gasses and experience loss of life. These are the contributing factors to transformer failure. In addition, the arc flash hazard is at an unacceptable level. Project Scope: This project will rebuild the 57 kV high-side, convert the Orient substation from a dual tap configuration to an in-line sectionalizing station, replace Orient BR1 and BR2 (7.5 MVA nameplate) and the transformers with a new dual high side 28 MVA unit. In addition, replace the existing distribution box and open bay structures with a new metal clad switchgear enclosures. The enclosure consists of seven cubicle positions. The substation yard will be increased by 2750 square feet to accommodate the insertion of a 35' X 15' control enclosure, expansion of the access gate and realignment of the high side structure, and the installation of a new SCADA system.
Shute-West Union 115 Line Addition (P36211)	7/1/2016	12/31/2018	$7,552,211	This project will construct a new 4.4 mile transmission line from Shute substation to West Union substation. Almost all of the work will be in construction of the 115kV line. West Union substation will require build out including one circuit breaker. Shute substation will not require any build out. In the current state a single event can remove both 115kV lines from Shute substation to Sunset substation from service. In this case all customers fed from Shute substation would lose service. Shute substation serves primarily

Project Narrative
Projects Greater Than $1.0 Million Starting in 2017
(All costs are fully loaded, excluding AFUDC)

Title	Start	End	Amount	Notes
				industrial customers. Several types of single events could remove both existing 115kV lines to Shute from service due to their structures and close proximity. For example, any debris in one line could easily make contact with the other, a single structure failure would remove both lines from service, or lightning strike that removes one from service could easily remove the other one from service.
Tabor Control Enclosure Upgrades (P36240)	11/30/2016	12/31/2020	$1,221,778	This project will upgrade the control enclosure at Tabor Substation. The major capital costs are for reroofing, rebuilding brick and concrete walls and installing sheet metal. The majority of the O&M costs are for removal and disposal of asbestos and lead-based paint. The current control enclosure was built in the early 1890's and has had various additions since. Several aspects of the control enclosure are in a state of severe disrepair including the roof, walls and windows and water is entering the control enclosure at several locations. Additionally, the control enclosure contains construction material that does not meet current standards and is known to pose potential safety hazards - asbestos and lead-based paint.
Shute WJ2 Switchgear (P36251)	10/01/2016	12/01/2017	$2,542,362	This project will install a second 34.5kV metalclad switchgear at Shute substation. The Shute substation has two installed 50 MVA 115/34.5kV distribution transformers, but only on metalclad switchgear to serve customers. This project will allow PGE to serve customers at 34.5kV that have a requirement for service from two different transformers.
Websphere Disaster Recovery (P36264)	3/1/2017	12/31/2017	$2,055,386	This project requests to redesign and address the missing elements in Shared WebSphere infrastructure. Rather than moving servers, the project now plans to build new server clusters to provide a highly available environment with complete Disaster Recovery coverage in the RCC data center.
Tenant Improvements 2017 (P36266)	1/1/2017	12/31/2017	$1,779,030	Requesting funding for tenant improvements in 2017. Tenant improvements are agreed upon during the WTC lease negotiation process and are contractually bound by the lease agreement. In a Class A

Project Narrative
Projects Greater Than $1.0 Million Starting in 2017
(All costs are fully loaded, excluding AFUDC)

Title	Start	End	Amount	Notes
				building in downtown Portland these dollar amounts are market driven for tenant retention. WTC provides construction administration for these improvements.
Asset Preservation 2017 (P36267)	1/1/2017	12/31/2017	$1,500,135	This sustainability and energy efficiency project requests capital funding in 2017 to replace the ceiling system, lighting fixtures, and lighting controls. The existing lighting is inefficient and not in step with current technologies of Class A buildings in the downtown area. The new lighting system will also provide a significant reduction, approximately 50%, in energy costs. The existing ceiling system consists of a concealed spline suspended ceiling system that must be dismantled like a puzzle to access the ceiling systems above. Each time the ceiling is opened to do work, a significant number of ceiling tiles are damaged as a result. The new ceiling will allow easy access to building components above the ceiling system using a traditional ceiling system with drop-in tiles. Currently, when ordering replacement tiles, the only type we can get have a different pattern so they do not match our existing tiles. Consideration details include the following: - The existing ceiling and lighting systems are 35 years old, beyond useful life - Improved energy efficiencies, 50% energy reduction - The existing lighting system is difficult to maintain and Original Equipment Manufacturer (OEM) parts are not available
Replace Glendoveer-Gresham 115kV (P36273)	1/1/2017	12/30/2017	$2,309,091	This project requests in 2017 to replace the existing Glendoveer-Gresham 115kV wood structures and conductor through the Gresham-Fairview Trail corridor and adjacent wetlands with new ductile iron structures. The project will replace 18 wood poles with ductile iron poles along the Glendoveer-Gresham 115kV line that are located in a PGE easement in the channel of Fairview Creek along the Gresham-Fairview Trail. The area in question is a regulated waterway. The transmission wire would be re-conductored to 795 KCM ACSS (26/7) - Drake. The Centennial-Centennial 13 feeder would also be relocated to these structures from its current

Project Narrative
Projects Greater Than $1.0 Million Starting in 2017
(All costs are fully loaded, excluding AFUDC)

Title	Start	End	Amount	Notes
				location as under build on the Glisan-Gresham 115kV line. One of the drivers to complete this project in 2017 is to align it with the environmental permitting and construction of the new adjacent Blue Lake-Gresham 230kV circuit construction through the same corridor.
Purchase Mobile Transformers (P36280)	1/1/2017	7/31/2017	$8,400,000	This project is a budgetary outside purchase request for $8,400,000 to purchase four mobile substations to support planned T&D work scheduled for 2017.
2017 Server Fitness (P36284)	1/1/2017	12/31/2017	$5,999,135	This project funds the replacement of aging servers, storage and backup infrastructure components reaching their end of life as well as purchase of new resources to meet the incremental growth needs of existing information systems, (includes server automation). Increased funds from 2016 to 2017 are for Increase of 30% in the amount of servers requiring replacement. Storage vintage was not needed in 2016 as reflected in the reduction from 2015. Storage vintage is required again in 2017.
2017 Network Fitness (P36286)	1/1/2017	12/31/2017	$3,028,066	This project funds the replacement of aging network infrastructure components reaching their end of life as well as the purchase of new resources to meet the incremental growth needs of existing information systems. Includes Unified Communication Vintage and Network Automation. The increase in funds from 2016 to 2017 reflects a larger amount of end of life equipment for 2017. The project also now includes replacement of Video Conference equipment and Digital Signage for the first time. The purpose of this project is to mitigate negative impact to the business due to the aging of critical network infrastructure and related systems and the increase of bandwidth requirements, as well as the need for additional features and functions beyond the capacity of existing computing resources. 1) Provide a network infrastructure, which is supportable, manageable,

Project Narrative
Projects Greater Than $1.0 Million Starting in 2017
(All costs are fully loaded, excluding AFUDC)

Title	Start	End	Amount	Notes
				reliable and scalable. 2) Replace network infrastructure at the optimal time so that system uptime is not impacted by frequent failure of hardware components. 3) Provide additional resources to stressed systems to alleviate potential performance, stability or usability issues. 4) Provide services in a timely manner to ensure business objectives are met.
2017 Cyber Security Fitness (P36287)	1/1/2017	12/31/2017	$1,643,045	This project requests to purchase/implement cyber security equipment to maintain the reliability and supportability of infrastructure that supports critical business systems. This project funds the replacement of aging cyber security infrastructure components reaching their end of life. This project requests funding for Cybersecurity software and hardware upgrades for: (1) Anti-Virus (2) Vulnerability Tool (3) File Integrity Monitoring (FIM) Technology (4) Security Information Event Management (SIEM) Tool
2017 Desktop Fitness (P36288)	1/1/2017	12/31/2017	$4,252,230	This project request is to purchase desktop technology equipment which includes desktop and laptop computers and peripherals, printers, FAX machines, scanners, portable projectors, audio visual equipment and approved ergonomic equipment. This project covers both the replacement of equipment on a scheduled vintage cycle as well as equipment for new hires, temporary employees, and contractors. It also includes equipment for ADA and ergonomic requirements, and business driven needs such as job scope changes. The increase in funds from 2016 to 2017 is for: 1. We are on a 4-year replacement cycle, and 4 years ago the number of PC's/Laptops deployed was much higher than what we needed to replace in 2016. 2. We are trying to move to a 3-year cycle for laptops, and need to increase

Project Narrative
Projects Greater Than $1.0 Million Starting in 2017
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Title	Start	End	Amount	Notes
				the budget to accommodate that. 3. We are trying to retire the old 20" monitors and move more of the company to the 24" monitors.
SN: Throat Liner Unit 13 (P36301)	1/1/2017	10/31/2017	$2,015,493	This job will address a number of issues with Sullivan Unit 13. The largest component of the proposed work is to replace the throat liner, which is essentially a large piece of piping that contains the water as it flows through the turbine. The throat liner on Unit 13 has broken loose and has rotated. This is unacceptable as the throat liner is a tight tolerance piece in close proximity to the runner. If it were to move too much it could contact the runner, causing damage and an unplanned outage to repair. Additionally, a worn throat liner reduces the unit's operational efficiency. The tilting screen is in place to prevent fish from entering the turbine and is a critical component to the Sullivan plant meeting the license mandated fish survival criteria. The tilting screen has become damaged over the years and has extensive rust, bringing the structural integrity of the screen into question. If the screen were to fail it has the potential to go into the turbine, causing severe damage to the unit. If the overall throat liner job is not approved the tilting screen would still need to be replaced to ensure the safe and reliable operation of Unit 13, as well as maintaining the license compliance of the entire Sullivan plant. Two additional components of this job that would be completed as fitness jobs in 2017 if the throat liner job is not approved are the addition of access stairs and platforms to reach the unit 13 draft tube and the replacement of the wall/column between units 12 and 13. The access platforms are needed to safely reach the unit 13 draft tube for inspections and repairs. Currently workers must traverse down a rocky embankment and then take a small boat into the draft tube to perform work. The current access route exposes workers to too much risk. The wall between units 12 and 13 also must be replaced. It was recently patched together as a temporary fix, but will not last as a long-term solution. It is more efficient to perform this work in conjunction with the throat liner, rather than having separate mobilizations.

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