



e-FILING REPORT COVER SHEET

COMPANY NAME: PORTLAND GENERAL ELECTRIC COMPANY

DOES REPORT CONTAIN CONFIDENTIAL INFORMATION? No Yes If yes, submit a redacted public version (or a cover letter) by email. Submit the confidential information as directed in OAR 860-001-0070 or the terms of an applicable protective order.

Select report type: RE (Electric) RG (Gas) RW (Water) RT (Telecommunications) RO (Other, for example, industry safety information)

Did you previously file a similar report? No Yes, report docket number: 18 (6)

Report is required by: OAR Statute ORS 757.105 and ORS 759.100 Order

Note: A one-time submission required by an order is a compliance filing and not a report (file compliance in the applicable docket)

Other (For example, federal regulations, or requested by Staff)

Is this report associated with a specific docket/case? No Yes, docket number:

List Key Words for this report. We use these to improve search results.

Portland General Electric Company 2018 New Construction Budget Report RE-18

Send the completed Cover Sheet and the Report in an email addressed to PUC.FilingCenter@state.or.us

Send confidential information, voluminous reports, or energy utility Results of Operations Reports to PUC Filing Center, PO Box 1088, Salem, OR 97308-1088 or by delivery service to 201 High Street SE Suite 100, Salem, OR 97301.



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

March 30, 2018

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 – 2018 New Construction Budget Report 18(6)

Enclosed for filing is Portland General Electric Company's New Construction Budget Report for the 2018 calendar year. This report is being provided per OAR 860-027-0015 and the 2018 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 503.464.7805.

Sincerely,

A handwritten signature in blue ink that reads "Stefan Brown". The signature is written in a cursive, flowing style.

Stefan Brown
Manager, Regulatory Affairs

SB:np

Enclosure

cc: Darrington Outama, PGE



ELECTRIC COMPANY NEW CONSTRUCTION BUDGET FOR 2018

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 PORTLAND GENERAL ELECTRIC			
ADDRESS: PO BOX OR STREET NUMBER 121 SW SALMON ST	CITY PORTLAND	STATE OR	ZIP CODE 97204
CERTIFICATION: I CERTIFY THAT THE INFORMATION REPORTED IS TRUE AND COMPLETE TO THE BEST OF MY KNOWLEDGE.			
SIGNATURE 	TITLE SVP FINANCE, CFO, TREASURER	DATE 3-27-18	

SCHEDULE B: ELECTRIC COMPANY NEW CONSTRUCTION BUDGET (SYSTEM)	COMPANY: Portland General Electric	BUDGET YEAR: 2018
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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.)						REQUIRED TO COMPLETE	TOTAL [5]
				PRIOR TO B.Y. (1)	B.Y. (2)	B.Y. + 1 (3)	B.Y. + 2 (3)	B.Y. + 3 (3)	B.Y. + 4 (3)		
MAJOR PRODUCTION PROJECTS [4]:											
Beaver: Replace HRSG Superheaters		100%	Dec-17	13,146	0	0	0	0	0	0	13,146
Carty Generating Facility		100%	Jul-16	572,029	0	0	0	0	0	0	572,029
Port Westward 2 Construction		100%	Oct-18	281,431	774	137	0	0	0	0	282,342
West Side Hydro Structural/Reliability Upgrades		100%	Dec-19	23,890	8,375	10,293	0	0	0	0	42,558
Hydro Control System Upgrade		100%	Oct-20	5,573	9,380	6,549	3,051	0	0	0	24,552
FY: Repower Faraday Units 1-5		100%	Aug-19	2,915	33,089	21,413	15,982	0	0	0	73,399
NON-MAJOR PRODUCTION PROJECTS [6]											
TOTAL PRODUCTION PROJECTS				898,983	107,334	95,934	78,484	61,237	63,002	0	1,304,973
MAJOR TRANSMISSION PROJECTS [4]:											
Blue Lake/Gresham - Substation Upgrades		100%	Jun-18	33,537	3,939	0	0	0	0	0	37,476
Horizon Phase II Project		100%	Dec-18	13,095	10,562	4,836	0	0	0	0	28,493
Harborton Reliability Project		100%	Jun-20	2,944	10,467	11,450	2,464	0	0	0	27,326
NON-MAJOR TRANSMISSION PROJECTS [6]											
TOTAL TRANSMISSION PROJECTS				49,577	39,122	30,905	17,568	15,557	16,006	0	168,736
DISTRIBUTION (SEE INSTRUCTION 3): [7]											
STATION EQUIPMENT					61,961						
POLES, TOWERS AND FIXTURES					28,869						
OVERHEAD CONDUCTORS AND DEVICES					47,803						
UNDERGROUND CONDUCTORS AND DEVICES					59,667						
UNDERGROUND CONDUIT					1,248						
LINE TRANSFORMERS					8,437						
SERVICES					33,504						
METERS					3,611						
STREET LIGHTING AND SIGNAL SYSTEMS					6,765						
OTHER:					266						
TOTAL DISTRIBUTION				168,214	252,131	243,320	251,392	258,943	266,406		1,440,407
MAJOR GENERAL PLANT PROJECTS [4]:											
Customer Touch Points			Apr-18	113,834	15,083	0	0	0	0	0	128,917
Field Voice Communications System			Dec-18	8,759	33,376	7,237	0	0	0	0	49,372
Substation Communication Upgrade			Dec-22	8,328	13,043	11,278	10,725	8,186	2,788	0	54,347
Energy Market Readiness			Sep-17	12,338	0	0	0	0	0	0	12,338
Vintage Vehicle Replacement II			Dec-20	0	11,504	2,508	0	0	0	0	14,012
NON-MAJOR GENERAL PLANT PROJECTS [6]											
TOTAL GENERAL PLANT PROJECTS				143,260	140,297	90,521	82,528	82,147	78,880	0	617,632
TOTAL NEW CONSTRUCTION BUDGET				1,260,034	538,884	460,681	429,972	417,883	424,294	0	3,531,747

1) Includes cumulative actual expenditures through Budget Year.

2) Budget includes costs that were approved at the October 2017 Board of Directors meeting and tie to the approved 2018 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 2018 forecast with 2019, 2020, 2021, 2022 trended for inflation by Global Insight Chained Price Index - Public Utilities - Nov 2017 with the exception of Major Projects which forecasts at the time of the time 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 2018 portion of nine major Distribution projects which are detailed in the Major Project narrative (> \$10 million): T&D Major System Inspection, Vehicle Vintage Replacement, Build Rock Creek Substation, Horizon Phase II, Dist System Line Construction, McGill Sub, Marquam Sub, SAM UG Cable, and PCB Transformers.

SCHEDULE B: ELECTRIC COMPANY NEW CONSTRUCTION BUDGET (SYSTEM)				COMPANY: Portland General Electric						BUDGET YEAR: 2018	
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.)						REQUIRED TO COMPLETE	TOTAL ^[4]
				PRIOR TO B.Y. ⁽¹⁾	B.Y. ⁽²⁾	B.Y. + 1 ⁽³⁾	B.Y. + 2 ⁽³⁾	B.Y. + 3 ⁽³⁾	B.Y. + 4 ⁽³⁾		
2017 OPUC Construction Budget B											
Trojan Decommissioning:											
Independent Spent Fuel Storage Installation		67.5%		2,827	2,748	2,812	2,803	2,875	2,952	75,437	92,454
Non-Major Decommissioning Projects		67.5%		0	0	0	0	0	0	3,592	3,592
Total Decommissioning Projects				2,827	2,748	2,812	2,803	2,875	2,952	79,030	96,046

1) Actuals up through December 2017

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 2017

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
Port Westward 2 Construction (P35205)*	1/01/2013	3/31/2019	\$284,068,509	<p>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).</p> <p>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.</p> <p>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.</p>
Blue Lake/Gresham - System Upgrades (P35329) *	1/1/2014	6/1/2018	\$33,575,608	<p>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.</p>
Build New Rock Creek Substation (P35572)	6/01/2015	3/31/2018	\$12,039,829	<p>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 addition, West Union substation will not be able to provide a strong enough source for loads at the east end of the North Bethany area.</p>

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	\$116,402,036	<p>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.</p> <p>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.</p>
Construct Marquam Substation (P35679)*	1/1/2014	12/31/2018	\$75,094,664	<p>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.</p> <p>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</p>

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
				<p>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.</p> <p>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.</p>
Horizon Phase II Project (P35802)	1/1/2015	12/31/2017	\$34,849,639	<p>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.</p> <p>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 reliability of the communication network. The project total has increased from the prior year due to entering the construction phase.</p>
SAM: Proactive Underground Cable Program (P35908)	1/1/2015	12/31/2019	\$44,593,771	The Strategic Asset Management (SAM) program was established to ensure long-term system reliability by identifying asset-related

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
				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 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	\$48,804,657	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	\$38,323,415	<p>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.</p> <p>The four facilities that are included in the scope of this project are:</p> <ol style="list-style-type: none"> 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

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
PCB Transformer Replacement (P35980)	8/1/2015	9/30/2021	\$73,986,225	<p>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.</p> <p>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 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.</p> <p>The budget has gone up since the last report due to identification of additional 1,252 transformers that will need to be replaced.</p>
Harborton Reliability Project (P36039)	7/1/2015	10/31/2020	\$47,173,674	<p>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.</p> <p>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.</p> <p>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</p>

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
				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 reconducted to provide the necessary transmission capacity. Equipment at Wacker and Station E will also be upgraded due to the additional capacity requirements.
Substation Communication Upgrade (P36101)	1/1/2016	12/31/2022	\$49,905,800	This multi-year project procures the necessary network hardware to replace the current communication infrastructure to 92 of PGE's substations. Telephone companies are discontinuing the analog communication circuits that PGE uses to relay data to and from its substations and thus needs to be replaced.
Hydro Control System Upgrade (P36134)*	8/1/2015	10/31/2020	\$22,584,539	<p>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.</p> <p>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).</p>
FY: Repower Faraday Units 1-5 (P36167)	11/23/2015	8/31/2019	\$55,260,086	<p>PGE has identified many asset management projects to be complete in the next five years that replace equipment or features that are long overdue.</p> <p>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.</p>

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
McGill Sub Capacity Additions (P36229)	8/1/2016	12/31/2018	\$13,776,135	<p>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.</p> <p>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.</p> <p>Replace existing 20 relays associated with the protection of the two transmission lines (Glisan-McGill 115 kV and Hogan South-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.</p>
T&D Substation Reliability Upgrades (P36272)	1/1/2017	12/31/2020	\$58,125,310	<p>This project targets aging substations and related infrastructure to improve system reliability and safety.</p> <p>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.</p>

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
				<p>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</p> <p>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.</p>
Blue Lake Phase II (P36373)*	6/1/2017	12/31/2021	\$31,735,397	<p>This project is requesting funding to design and permit the distribution feeder improvements to serve a new Amazon distribution center, which has started construction near the Blue Lake Substation.</p> <p>Project Scope Includes: The Blue Lake Phase II project will construct a second 115kV ring bus and install a second 230/115 kV bulk power transfer at the Blue Lake Substation, install a second 115/13kV distribution transformer and three position switchgear, construct two new distribution feeders from Blue Lake Substation, upgrade existing Blue Lake substation feeders, construct the new Blue Lake-McGill 115vK transmission circuit, construct the new Blue Lake – Tabor 115kV transmission circuit, and decommission the Lineman substation.</p>

Project Narrative
Projects Greater Than \$1.0 Million Starting in 2018
(All costs are fully loaded, excluding AFUDC)

Title	Start	End	Amount	Notes
BC: Construct 230kV Ring Bus (P35951)	9/1/2017	11/30/2018	\$1,624,631	<p>This project will replace the existing radial configuration of the 230kV bus at Biglow Canyon switchyard. The developer of the Golden Hills project abandoned its land rights to wind development which effectively released BPA from any obligation to complete the 230kV ring at Biglow Canyon. Closing the radial 230kV bus will improve the reliability of the plant by eliminating the potential for power curtailment from outages due to equipment failure or maintenance activities.</p> <p>Project Scope Includes: Extending the Biglow Canyon 230kV bus and add two breakers, separated by an additional transmission line to Golden Hills. One 230kV breaker position can be removed from the scope long with an interconnection of the (future) Golden Hills Line.</p>
Elevator Modernization (P36268)	2/2/2018	12/31/2018	\$1,082,000	<p>This project will replace the generation drives and control systems in the current elevator system. The new generation system can provide quicker, more reliable service, while reducing energy use by as much as 20 percent.</p> <p>Project Scope Includes: Seven elevator cabs in the 1WTC building and four elevators in the 3WTC building. Port Destination Dispatch with integrated security, Stainless Steel car operating panels for all 11 cabs, and consultant design and oversight.</p>
St Marys System Protection Upgrade (P36341)	1/1/2017	12/31/2019	\$3,535,266	<p>The St Marys Battery project will construct a new 230kV substation control house at the St Mary's substation. The West side transmission system is at risk of dropping approximately 725MW of load during peak summer conditions for an unprotected fault on the 230kV system connected to the St Mary's substation.</p>

Project Narrative
Projects Greater Than \$1.0 Million Starting in 2018
(All costs are fully loaded, excluding AFUDC)

Title	Start	End	Amount	Notes
				Project Scope Includes: New control house that is pre-wired with new relay racks for all existing 230kV line positions and transformers. It will be designed to accommodate the 115kV relay racks when the existing 115kV relay racks are replaced and will include two substation batteries to meet current PGE design standards for 230kV substation.
Oswego Substation Rebuild (P36388)	6/15/2017	3/1/2020	\$4,632,876	This project requests funding to upgrade Lake Oswego's and Sullivan's Substation underperforming feeders. The Oswego-Marylhurst distribution feeder has recently been heavily impacted by tree limbs and weather conditions, resulting in extended power outages and single source key customers. Project Scope Includes: Upgrading approximately 4 miles of overhead conductor with 795 AAC Tree Wire conductors.
Parks Fitness Fund (P36408)	1/1/2018	12/31/2025	\$1,624,631	This project is requesting funding due to the growing amount of small capital improvement jobs at recreation sites as well as several USFS campgrounds around Timothy Lake, and the aged infrastructure of some existing parks that create potential public and employee safety issues.
FY: Upgrade Faraday AWS System (P36424)	1/1/2018	12/31/2020	\$9,670,875	The existing Faraday Diversion Dam is operating at its maximum capacity to provide license required minimum flow in the Bypass Reach of the Clackamas River. Operating in this condition requires that the diversion pool be maintained near its maximum pool elevation which limits flexibility in operation of the hydroelectric system. The Attraction Water System pipeline passes through the right abutment of the Faraday Diversion dam. Erosion caused by a ruptured pipeline in this area could jeopardize the foundation of the dam there.

Project Narrative
Projects Greater Than \$1.0 Million Starting in 2018
(All costs are fully loaded, excluding AFUDC)

Title	Start	End	Amount	Notes
				Installation of a new pipeline will provide a measure of security against this possible erosion.
WSH: Upgrade Excitation System (P36444)	1/1/2018	10/30/2021	\$3,613,348	<p>This project requests funding to replace Excitation equipment at West Side Hydro. The current equipment has been in service past its designed service life and from a maintenance perspective, current excitation equipment is obsolete. New WECC regulations also require mandates that protection functions be eliminated from equipment, which is not possible with the existing equipment.</p> <p>Project Scope Includes: All engineering, with equipment specifications, and vendor selection complete to support purchase of excitation equipment.</p>
PN: Build Bulkhead & Paint Gates (P36448)	4/1/2018	11/30/2019	\$1,115,531	<p>This project is requesting funding to provide design and fabrication of a spillway bulkhead to support full height gate testing that is required every five years.</p> <p>Project Scope Includes: Design/construction of the bulkhead and painting of the upstream and downstream structural steel of the tainter gates.</p>
PRB: Upgrade Excitation System (P36449)	1/1/2018	5/31/2021	\$2,030,125	<p>This project is requesting funding because of the new WECC regulations have stricter requirements for excitation control with use of Power System Stabilizer. The current system is obsolete and is making purchasing replacement parts increasingly more expensive and difficult.</p> <p>Project Scope Includes: 2018 work is primarily engineering, with equipment specifications and vendor selection to be completed in late 2018. Installation for both Pelton and Round Butte</p>

Project Narrative
Projects Greater Than \$1.0 Million Starting in 2018
(All costs are fully loaded, excluding AFUDC)

Title	Start	End	Amount	Notes
				units 1 to take place during the winter of 2018, while Pelton/Round butte Units 2 will follow with installation in 2020 and 2021.
Urban Feeder UG Conversion (P36450)	1/1/2018	12/31/2018	\$4,737,826	This project is requesting funding to convert three overhead sections on three radial feeders that serve OHSU Marquam Hill to underground distribution. Project Scope Includes: Add two separate duct banks beneath SW Barbur Blvd, and concert approximately a total of one mile of overhead feeder conductors to unground cable for three feeders.
RB – Replace Governors (P36456)	1/1/2018	7/17/2021	\$1,694,937	Project is requesting funding to replace the existing mechanical governors with electric governors at Pelton and Round Butte. New WECC requirements require testing and documentation that is easier and more cost effective to complete on a digital governor. The current governors often have trouble bringing the units online and syncing them to the grid, which results in a failed start. New digital governors will solve this problem.
WSH – Governor Replacement (P36458)	1/1/2018	3/20/2021	\$2,817,254	Project is requesting funding to replace existing mechanical governors with electric governors at Clackamas River hydro. The current governors often have trouble bringing the units online and syncing them to the grid, which results in a failed start. In addition, the new WECC requirements require testing and documentation that is easier and more cost effective to complete on a digital governor.
Facilities Asphalt R&R Project (P36464)	1/1/2018	12/31/2022	\$4,435,000	This project is requesting funding to remove and replace asphalt at all Facility’s sites. After an in-depth review of each campus, six high priority sites were identified. This project will not only remove and replace existing asphalt for these six sites, but will provide the assets needed to provide on-going preventative maintenance that will

Project Narrative
Projects Greater Than \$1.0 Million Starting in 2018
(All costs are fully loaded, excluding AFUDC)

Title	Start	End	Amount	Notes
				extend the useful life of the asphalt by ten to twenty years.
BR – GSU Transformer Maintenance (P36466)	11/1/2017	12/30/2020	\$1,717,793	<p>Currently, the GSU (Generator Step UP) transformers at the Beaver facility are leaking oil from the radiator fins and oil pump. The bushings are old and the heat exchanger is rusted. The transformers are over 40 years old and need major maintenance overhauls to ensure their operation for years to come.</p> <p>Project Scope Includes: Draining transformers of oil, disassembly, re-gasketed, and replace old bushings, gauges, pumps, and coolers.</p>
Sensus DT34 Meter Exchanges (P36470)	3/1/2018	12/31/2020	\$7,090,768	<p>This project is requesting funding in order to enable CET the ability to provide pricing programs for all customers based on interval data. Firmware updates to correct the interval data accuracy have been attempted unsuccessfully and Sensus has advised that the only solution is a meter exchange.</p> <p>Project Scope Includes: Exchanging 12,000 meters (Schedule 83, 85, 89) and is projected to take 2+ years.</p>



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