

Major Capital Projects¹ - End-of-Project Target Performance

Q3 2018

Project	Description	Direct Capital \$M ²			In-Service Date	
		Target	Forecast	Actual ³	Target	Forecast
Transmission						
Sustain Steel Program Defective Damper Replacements	Replace approximately 1,700 miles of defective PPI spacer dampers.	\$ 34.4	\$ 32.6	\$ 30.4	9/30/14	12/28/18
500 kV Spare Transformer Project	Acquire 5 spares and relocate 2 existing transformers to be used as spares. The spares will be placed strategically across the system.	\$ 41.0	\$ 52.1	\$ 51.8	12/31/13	6/30/19
Fleet Mobile Equipment Replacement FY17-19	Heavy duty and specialized vehicle replacement program for FY17-19	\$ 17.2	\$ 17.2	\$ 2.1	9/30/19	9/30/19
Ross - Schultz Fiber Replacement	Replace the obsolete and limited 36 strand fiber with standard 72 strand fiber.	\$ 34.0	\$ 40.2	\$ 27.4	9/15/17	12/21/21
P25 Two-Way Mobile Radio Upgrade	Replace and upgrade the mobile radio system to P25 technology.	\$ 64.5	\$ 75.0	\$ 19.7	9/30/17	12/22/25
Puget Sound Area Northern Intertie (PSANI) Memorandum of Agreement	Install a 500/230 kV transformer bank addition at Raver Substation.	\$ 56.4	\$ 45.9	\$ 33.5	9/30/16	12/2/18
Lower Valley Area Reinforcement (Hooper Springs)	Construct substation and 24 miles of line to address reliability issues in the Lower Valley Area.	\$ 63.8	\$ -	\$ -	9/30/17	N/A
Operational Multi-Gigabit Ethernet Transport (OMET)	Communications upgrade and replacement to ensure adequate capacity and compatibility for emerging requirements.	\$ 43.5	\$ 46.1	\$ 24.8	3/30/17	2/28/21
Paul Substation Shunt Reactor Addition	Install an additional reactor in the Portland area for voltage control.	\$ 9.5	\$ 14.7	\$ 12.7	4/30/16	3/29/19
Spare Transformers for Hub Wind Sites	Add a spare 500/230 kV single phase transformer at John Day, Rock Creek, Slatt and Central Ferry substations.	\$ 18.6	\$ 20.8	\$ 12.6	10/15/18	1/31/19
Midway-Grandview No. 1 Line Upgrade	Rebuild 25 mile line to avoid risk of thermal overload.	\$ 18.6	\$ 10.5	\$ 10.2	4/30/18	4/30/18
Kalispell - Hot Springs Fiber	Install fiber optic cable and associated SONET, RAS and transfer trip equipment.	\$ 7.9	\$ 7.1	\$ 4.4	6/30/19	6/30/19
Sundial Land Acquisition	Purchase property for future expansion near the existing Troutdale Substation.	N/A ⁴	N/A ⁴	\$ 0.6	9/30/17	11/15/19
Quenett Creek Substation L0380	Construct new substation and associated line work to serve additional N. Wasco PUD load.	\$ 39.8	\$ 48.3	\$ 12.4	6/30/19	6/30/19
Avangrid Montague I Wind Project	Interconnection facilities for Avangrid's wind project.	\$ 8.9	\$ 9.0	\$ 1.8	12/11/18	7/31/19
UEC Morrow Flat Phase II	Interconnection facilities for Umatilla Electric Cooperative load service request.	\$ 14.9	\$ 16.2	\$ 0.1	9/1/19	9/1/19
Central Oregon Series Capacitor	Add capacitors at Slatt and Bakeoven to support load growth.	\$ 16.5	\$ 9.6	\$ 0.5	2/28/19	3/15/19
Wheatridge Wind	Interconnection for NextEra's Wheatridge wind project.	\$ 8.7	\$ 8.4	\$ -	10/31/19	10/1/20
Steel Lines Sustain Program FY18-19	Two-year asset replacement plan based on asset strategy analysis.	\$ 44.0	\$ 39.2	\$ 13.4	9/30/19	9/30/19
Wood Pole Lines Sustain Program FY18-19	Two-year asset replacement plan based on asset strategy analysis.	\$ 77.5	\$ 68.7	\$ 17.7	9/30/19	9/30/19
Access Roads Sustain Program FY18-19	Two-year asset replacement plan based on asset strategy analysis.	\$ 36.7	\$ 44.2	\$ 10.8	9/30/19	9/30/19
Land and Land Rights Sustain Program FY18-19	Two-year asset replacement plan based on asset strategy analysis.	\$ 10.6	\$ 13.0	\$ 0.3	9/30/19	9/30/19
AC Substations Sustain Program FY18-19	Two-year asset replacement plan based on asset strategy analysis.	\$ 83.4	\$ 121.2	\$ 33.4	9/30/19	9/30/19
DC Substations Sustain Program FY18-19	Two-year asset replacement plan based on asset strategy analysis.	\$ 22.1	\$ 16.8	\$ 0.3	9/30/19	9/30/19

This information has been made publicly available by BPA on 8/9/2018 and contains information not sourced directly from BPA financial statements.

¹ Includes capital projects authorized at the agency level since August 2007

² Direct capital costs exclude AFUDC and overheads

³ Actual costs are project costs to date.

⁴ Contracts have not been awarded - cost estimates are confidential

Major Capital Projects¹ - End-of-Project Target Performance

Q3 2018

Project	Description	Direct Capital \$M ²			In-Service Date	
		Target	Forecast	Actual ³	Target	Forecast
Transmission - continued						
System Telecommunications Sustain Program FY18-19	Two-year asset replacement plan based on asset strategy analysis.	\$ 32.0	\$ 38.7	\$ 7.9	9/30/19	9/30/19
Power Systems Control Sustain Program FY18-19	Two-year asset replacement plan based on asset strategy analysis.	\$ 40.7	\$ 39.7	\$ 7.3	9/30/19	9/30/19
System Protection and Control Sustain Program FY18-19	Two-year asset replacement plan based on asset strategy analysis.	\$ 40.7	\$ 40.9	\$ 8.4	9/30/19	9/30/19
Control Center Sustain Program FY18-19	Two-year asset replacement plan based on asset strategy analysis.	\$ 12.7	\$ 11.6	\$ 2.9	9/30/19	9/30/19
Federal Hydro						
Grand Coulee and Hungry Horse SCADA Replacement	Replace SCADA systems at Grand Coulee and Hungry Horse.	\$ 46.8	\$ 73.7	\$ 61.2	9/30/15	9/1/20
Grand Coulee Pre Overhaul - Winding Replacement G19, G20	Replace the stator core and windings on units G19 and G20.	N/A ⁴	N/A ⁴	\$ 2.0	5/31/13	12/31/18
Grand Coulee Stator Windings, Cores and Spare G1-G18	Replace 14 stator cores and windings. G4,5,7,9 were previously replaced.	N/A ⁴	N/A ⁴	\$ 0.7	12/2/23	9/29/2038
Grand Coulee Exciter Replacements G1-G18	Replace the excitation equipment for all 18 units.	N/A ⁴	N/A ⁴	\$ 0.5	12/2/23	12/31/30
Grand Coulee Governor Replacements G1-G18	Replace the governors and related equipment for all 18 units.	N/A ⁴	N/A ⁴	\$ 0.4	12/2/23	12/31/30
Grand Coulee Transformer Replacements G11-G18	Replace 24 single-phase transformers in the Right Powerhouse.	\$ 32.5	\$ 57.2	\$ 0.7	10/31/18	12/2/24
Grand Coulee - Keys Pump Generating Station - Reliability	Replacements and upgrades to maintain current station capability.	\$ 66.6	\$ 66.3	\$ 16.6	9/30/24	3/31/24
Grand Coulee G22 - G23 Wicket Gate Replacements	Replace the deteriorating wicket gates.	\$ 9.0	\$ 9.0	\$ 7.5	11/1/18	9/29/19
Grand Coulee Firehouse	Build a stand-alone fire station to replace the facility currently housed in the pump-generating plant.	N/A ⁴	N/A ⁴	\$ 5.8	1/1/18	10/31/18
Grand Coulee Left and Right Powerhouse Cranes	Replace the four bridge cranes in the left and right powerhouses.	N/A ⁴	N/A ⁴	\$ 0.3	6/29/19	3/1/22
Grand Coulee Penstock Stoplogs	Procure an additional set of stoplogs to support the overhaul work in the left and right powerhouses.	N/A ⁴	N/A ⁴	\$ 0.2	12/31/18	9/30/19
Grand Coulee Third Powerhouse Roof	Replace the third powerhouse roof, including seismic, lighting and safety upgrades.	N/A ⁴	N/A ⁴	\$ 0.5	10/1/19	10/1/19
The Dalles Transformer Replacements	Replace 7 transformer banks - TA, T1, T3, T5, T6, T7, T8	\$ 37.0	\$ 37.0	\$ 18.0	5/9/19	6/4/21
The Dalles Fish Unit Breaker Replacement	Replace the two fish attraction unit breakers and associated bus work.	\$ 12.8	\$ 12.8	\$ 4.6	9/30/19	5/1/20
The Dalles Emergency Gantry Crane Replacement	Replace the emergency intake gantry crane.	N/A ⁴	N/A ⁴	\$ 0.9	9/1/22	9/1/22
McNary Governor Replacement	Upgrade the 14 governors in the McNary powerhouse with digital controls.	N/A ⁴	N/A ⁴	\$ 2.3	1/29/18	9/30/22
McNary 4160/480V Station Service Upgrade	Replace and upgrade the station service distribution system.	\$ 36.0	\$ 53.1	\$ 43.5	12/3/18	6/28/19

This information has been made publicly available by BPA on 8/9/2018 and contains information not sourced directly from BPA financial statements.

¹ Includes capital projects authorized at the agency level since August 2007

² Direct capital costs exclude AFUDC and overheads

³ Actual costs are project costs to date.

⁴ Contracts have not been awarded - cost estimates are confidential

Major Capital Projects¹ - End-of-Project Target Performance

Q3 2018

Project	Description	Direct Capital \$M ²			In-Service Date	
		Target	Forecast	Actual ³	Target	Forecast
Federal Hydro - continued						
McNary Turbine Design and Replacement	Replace turbine runners 1 - 14 and rewind units 5, 13 and 14.	N/A ⁴	N/A ⁴	\$ 5.5	6/30/31	6/30/31
Bonneville Powerhouse 1 Main Unit Breakers and Station Service	Replace oil-filled original equipment breakers and reconfigure and modernize the station service.	\$ 42.0	\$ 36.0	\$ 19.7	4/20/18	10/1/21
Bonneville Generator Coolers	Replace and upgrade the generator coolers in both powerhouses.	N/A ⁴	N/A ⁴	\$ 0.3	3/1/23	3/1/23
Bonneville Powerhouse 2 Oil/Water Separators	Replace and upgrade the turbine pit oil/water separator system.	N/A ⁴	N/A ⁴	\$ 0.6	8/3/20	8/3/20
John Day Turbine Hub Upgrades	Rebuild and upgrade up to five turbine runner hubs. Four additional hubs may be rebuilt under a future amendment to this project.	\$ 39.3	\$ 33.7	\$ 6.4	12/31/18	7/17/22
John Day Draft Tube Bulkheads and Intake Gates	Purchase two sets of draft tube bulkheads and one set of intake gates for additional de-watering.	\$ 11.9	\$ 11.9	\$ 9.8	9/4/18	10/12/18
John Day Emergency Gantry Crane Replacement	Replace the 348 ton emergency intake gantry crane.	N/A ⁴	N/A ⁴	\$ 5.5	2/1/20	2/1/20
John Day SQ Board Replacements	Replace SQ and SU electrical boards, switchgear and related equipment.	N/A ⁴	N/A ⁴	\$ 4.0	8/1/22	8/1/22
John Day Powerhouse Roof Replacement	Replace the powerhouse roof.	\$ 7.9	\$ 7.9	\$ 0.3	1/1/22	1/1/22
Dworshak U3 Stator and Coolers	Replace the winding, core and air coolers.	\$ 18.2	\$ 14.2	\$ 11.6	6/1/17	7/4/18
Ice Harbor Turbine Runner Replacement	Replace poor condition turbine runners in units 1, 2 & 3 with a more fish-friendly design.	\$ 97.0	\$ 103.6	\$ 60.0	3/31/20	12/31/21
Ice Harbor Stator Winding Replacements	Replace the stator windings for units 1,2 and 3.	\$ 22.5	\$ 15.5	\$ 8.3	3/31/20	9/1/20
Lower Monumental U1 Linkage Refurbishment	Refurbish turbine linkage and rewind generator.	\$ 14.8	\$ 20.0	\$ 12.1	3/1/16	12/31/18
Hungry Horse Crane Replacements	Replace two powerhouse bridge cranes, forebay gantry crane, machine shop crane and valve house crane.	N/A ⁴	N/A ⁴	\$ 0.7	9/30/20	10/30/20
Black Canyon Third Generating Unit	Add a third generating unit at Black Canyon. The capacity of the unit will be between 10 and 15 MW.	N/A ⁴	N/A ⁴	\$ 7.2	12/31/14	9/1/21
Black Canyon Switchyard Replacement	Replace and relocate the switchyard.	N/A ⁴	N/A ⁴	\$ 0.2	5/1/19	5/1/23
Palisades Turbine Rehabilitation and Runner Replacement	Replace the turbine runners and rehabilitate the turbines on the four Palisades units.	\$ 28.8	\$ 31.0	\$ 30.5	5/31/16	TBD
Willamette Valley and Lost Creek GDACS	Install Generic Data Acquisition and Control Systems to replace existing SCADA systems.	\$ 9.0	\$ 9.0	\$ 5.0	1/1/20	1/1/20

Facilities

Ross HMEM Garage	Construct a Heavy Mobile Equipment Mechanic facility on the Ross Complex.	\$ 25.5	\$ 22.7	\$ 1.3	12/31/19	12/31/19
------------------	---	---------	---------	--------	----------	----------

Summary

Transmission	\$ 898.6	\$ 887.7	\$ 347.4
Federal Hydro	532.1	591.9	353.4
Facilities	25.5	22.7	1.3
Total	\$ 1,456.2	\$ 1,502.3	\$ 702.1

This information has been made publicly available by BPA on 8/9/2018 and contains information not sourced directly from BPA financial statements.

¹ Includes capital projects authorized at the agency level since August 2007

² Direct capital costs exclude AFUDC and overheads

³ Actual costs are project costs to date.

⁴ Contracts have not been awarded - cost estimates are confidential