

## **Bonneville Power Administration (Bonneville, BPA)**

### **Proposed Appropriations Language**

Expenditures from the Bonneville Power Administration Fund, established pursuant to Public Law 93–454, are approved [for the Steigerwald Floodplain Restoration Project and, in addition,] for official reception and representation expenses in an amount not to exceed \$5,000: *Provided*, That during fiscal year [2020] 2021, no new direct loan obligations may be made[: *Provided further*, Expenditures from the Bonneville Power Administration Fund, established pursuant to Public Law 93–454 are authorized and approved, without fiscal year limitation, for the cost of current and future year purchases or payments of emissions expenses associated with Bonneville Power Administration power and transmission operations in states with clean energy programs: *Provided further*, This expenditure authorization is limited solely to Bonneville Power Administration’s voluntary purchase or payments made in conjunction with state clean energy programs and is not a broader waiver of Bonneville Power Administration’s sovereign immunity].

### **Explanation of Changes**

The proposed appropriations language restricts new direct loans in FY 2021 as in FY 2020. This bill language is drafted consistent with the Credit Reform Act of 1990.

**Please Note - The FY 2021 Bonneville Power Administration Congressional Budget submission includes FY 2020 budget estimates.**

Bonneville operates under a business-type budget under the Government Corporation Control Act, 31 U.S.C 9101-10 and on the basis of the self-financing authority provided by the Federal Columbia River Transmission System Act of 1974 (Transmission Act) (Public Law 93-454). Bonneville has authority to borrow from the U.S. Treasury under the Transmission Act, and the Pacific Northwest Electric Power Planning and Conservation Act of 1980 (Northwest Power Act) (Public Law 96-501) for acquisition of energy conservation, renewable and other power resources, investment in fish facilities, and other purposes, the American Recovery and Reinvestment Act of 2009 (Public Law 111-5), and other legislation. Authority to borrow from the U.S. Treasury is available to Bonneville on a permanent, revolving basis. The principal amount of U.S. Treasury borrowing outstanding at any time may not exceed \$7.70 billion<sup>1</sup>. Bonneville finances its approximate \$4.4 billion annual cost of operations and investments by primarily using its power and transmission revenues, and proceeds of borrowing from the U.S. Treasury.

This budget has been prepared in accordance with the Statutory Pay-As-You-Go Act (PAYGO) of 2010. Under PAYGO, all Bonneville budget estimates are treated as mandatory and are not subject to the discretionary caps included in the Budget Control Act of 2011. These estimates support activities that are separate from discretionary activities and accounts. Thus, any changes to Bonneville estimates cannot be used to affect any other budget categories, which have their own dollar caps. Because Bonneville's obligations are and will be incurred under pre-existing legislative authority, Bonneville is not subject to a "pay-as-you-go" test regarding its revision of current-law funding estimates.

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<sup>1</sup> The outstanding principal amount of bonds issued by Bonneville to the U.S. Treasury can be found in tables BP-4A – 4D in the Additional Tables section.

**Bonneville Power Administration**

**Funding Profile by Subprogram <sup>1/</sup>**

(Accrued Expenditures in Thousands of Dollars)

	Fiscal Year			
	2019 Actual	2020 Original <sup>1/2</sup>	2020 Revised <sup>1/2</sup>	2021 Proposed
Capital Investment Obligations				
Associated Project Costs <sup>3/</sup>	199,661	238,000	238,000	256,000
Fish & Wildlife	22,313	47,266	47,266	47,266
Subtotal, Power Services	221,974	285,266	285,266	303,266
Transmission Services	192,077	479,172	468,765	474,305
Capital Equipment & Bond Premium	10,029	22,099	22,100	22,131
Total, Capital Obligations <sup>3/</sup>	424,080	786,537	776,131	799,703
Expensed and Other Obligations				
Expensed	2,967,978	2,867,867	2,920,710	2,978,229
Projects Funded in Advance <sup>5/</sup>	239,228	85,886	85,896	66,179
Total, Obligations	3,631,286	3,740,290	3,782,736	3,844,110
Capital Transfers (cash)	733,505	407,536	350,933	401,721
Bonneville Total (Oligations & Capital Transfers)	4,364,791	4,147,826	4,133,669	4,245,831
Bonneville Net Outlays	67,000	(166,596)	(163,159)	(110,068)
Full-time Equivalent (FTEs) <sup>4/</sup>	2,727	3,000	3,000	3,000

**Public Law Authorizations include:**

Bonneville Project Act of 1937, Public Law No. 75-329

Federal Columbia River Transmission System Act of 1974, Public Law No. 93-454

Regional Preference Act of 1964, Public Law No. 88-552

Flood Control Act of 1944, Public Law No. 78-543

Pacific Northwest Electric Power Planning and Conservation Act of 1980 (Northwest Power Act), Public Law No. 96-501

**Outyear Funding Profile by Subprogram<sup>1/</sup>**

(Accrued Expenditures in Thousands of Dollars)

	Fiscal Year			
	2022	2023	2024	2025
Capital Investment Obligations				
Associated Project Costs <sup>3/</sup>	281,000	300,000	306,000	313,000
Fish & Wildlife	43,000	43,000	40,000	40,000
Subtotal, Power Services	324,000	343,000	346,000	353,000
Transmission Services	467,952	507,078	525,439	486,964
Capital Equipment & Bond Premium	22,296	22,268	21,146	20,271
Total, Capital Obligations <sup>3/</sup>	814,248	872,345	892,585	860,235
Expensed and Other Obligations				
Expensed	3,087,062	3,158,028	3,219,149	3,298,778
Projects Funded in Advance <sup>5/</sup>	60,463	39,848	39,823	40,947
Total, Obligations	3,961,773	4,070,221	4,151,557	4,199,960
Capital Transfers (cash)	370,837	329,598	313,705	300,902
Bonneville Total (Oligations & Capital Transfers)	4,332,610	4,399,819	4,465,262	4,500,862
Bonneville Net Outlays	(32,690)	53,373	119,735	143,013
Full-time Equivalents (FTEs) <sup>4/</sup>	3,000	3,000	3,000	3,000

**These notes are an integral part of this table.**

- <sup>1/</sup> This budget has been prepared in accordance with PAYGO. Under PAYGO all Bonneville budget estimates are treated as mandatory and are not subject to the discretionary caps included in the Budget Control Act of 2011. These estimates support activities that are separate from discretionary activities and accounts. Thus, any changes to Bonneville estimates cannot be used to affect any other budget categories which have their own dollar caps. Because Bonneville's obligations are and will be incurred under pre-existing legislative authority, Bonneville is not subject to a "pay-as-you-go" test regarding its revision of current-law funding estimates.
- <sup>2/</sup> Original estimates reflect Bonneville's FY 2020 Congressional Budget Submission. Revised estimates, consistent with Bonneville's annual near-term funding review process, provide notification to the Administration and Congress of updated capital and expense funding levels for FY 2020. The BPA estimates in this budget are consistent with the 2018 final IPR. Please see <https://www.bpa.gov/Finance/FinancialPublicProcesses/IPR/Pages/IPR-2018.aspx> for further information.
- <sup>3/</sup> Includes infrastructure investments to address the long-term electric power related needs of the Northwest and significant changes affecting Bonneville's power and transmission markets.
- <sup>4/</sup> As of October 25, 2019 DOE HR staff has reported FY 2019 BPA's FTE usage at 2,727.
- <sup>5/</sup> In this instance, Projects Funded in Advance represents prepayment of Power customers' bills reimbursed by future credits and third party non-federal financing for Conservation initiatives.

**Additional Notes**

Capital funding levels reflect external factors such as the significant changes affecting West Coast power and transmission markets, along with planned infrastructure investments designed to address the long-term needs of the region.

Cumulative advance amortization payments as of the end of FY 2019 are \$5,791 million.

Refer to 16 USC Chapters 12B, 12G, 12H, and Bonneville's other organic laws, including P.L. 100-371, Title III, Sec. 300, 102 Stat. 869, July 19, 1988, regarding Bonneville's ability to obligate funds.

Budget estimates included in this budget are subject to change due to rapidly changing economic and institutional conditions in the evolving electric utility industry.

Net Outlay estimates are based on current cost savings to date and anticipated cash management goals. They are expected to follow anticipated management decisions throughout the rate period that, along with actual market conditions, will impact revenues and expenses. Actual Net Outlays are volatile and are reported in Report on Budget Execution and Budgetary Resources (SF-133). Actual Net Outlays could differ from estimates due to changing market conditions, streamflow variability, continued restructuring of the electric industry, and other reasons.

Revenues, included in the Net Outlay formulation, are calculated consistent with cash management goals and assume a combination of adjustments. Assumed adjustments include the use of a combination of tools, including upcoming rate adjustment mechanisms, a net revenue risk adjustment, debt service refinancing strategies and/or short-term financial tools to manage net revenues and cash. Some of these potential tools will reduce costs rather than generate revenue, causing the same Net Outlay result. Adjustments for depreciation and 4(h)(10)(C) credits of the Northwest Power Act are also assumed.

FY 2019 Net Outlays are calculated using Bonneville's audited actual revenue. FYs 2020 to 2025 Net Outlays are based on 2018 final IPR assumptions and an escalation factor from using the FY 2018 White Book Loads and Resources Report

FTE outyear data are estimates and may change. Bonneville is facing a dynamic and changing energy marketplace and operations while, at the same time, many of its employees are eligible to retire in the near future. It is important that Bonneville continue to attract and retain skilled individuals to meet the growing demands of a competitive and rapidly changing industry. Accordingly, FTE estimates may need to be adjusted in the future.

Amounts in tables and schedules may not add to totals due to rounding.

**Major Outyear Considerations**

Bonneville's outyear estimates reflect ongoing efforts to achieve its long-term mission and strategic direction. The outyear estimates are developed with consideration and support of Bonneville's multi-year performance targets that lay out the course for achieving Bonneville's long-term objectives. Outyear capital investment levels support Bonneville's infrastructure program, hydro efficiency program, and its fish and wildlife mitigation projects.

Bonneville continues to incorporate the various aspects of the Energy Policy Act of 2005 related to its business, in particular the energy supply, conservation, and new energy technologies for the future that are highlighted in the legislation.

Bonneville provides electric power services, transmission services, and acquires energy efficiency throughout the Pacific Northwest. Bonneville serves a 300,000 square mile area including Oregon, Washington, Idaho, western Montana, and small parts of eastern Montana, California, Nevada, Utah, and Wyoming with a population of about 14 million people. Bonneville markets the electric power produced from 31 federal hydro projects in the Pacific Northwest owned by the U.S. Army Corps of Engineers (Corps) and the U.S. Department of Interior, Bureau of Reclamation (Reclamation)—the hydro projects are known as Associated Projects. In addition to the Associated Projects, Bonneville also acquires power from non-federal generating resources, including the power from a nuclear power plant, Columbia Generating Station (CGS). Bonneville uses the power from its non-federal purchases and the federal projects, collectively the Federal Columbia River Power System (FCRPS) primarily to meet the Administrator’s long term firm power sales contract obligations. Bonneville currently maintains and operates 15,209 circuit miles of transmission lines, 261 substations, and associated power system control and communications facilities over which this electric power is delivered. Bonneville has capital and similar leases for certain transmission facilities. Bonneville also supports the protection and enhancement of fish and wildlife, and promotes conservation and energy efficiency, as part of its efforts to preserve and balance the economic and environmental benefits of the FCRPS.

The organization of Bonneville’s FY 2021 Budget reflects Bonneville’s business services basis for utility enterprise activities. Bonneville’s two major areas of activity on a consolidated budget and accounting basis are Power Services (PS) and Transmission Services (TS) and include their related administrative costs. Power Services activities include line items for Fish and Wildlife, Energy Efficiency, Residential Exchange Program (REP), Associated Projects Operations & Maintenance (O&M) Costs, and Northwest Power and Conservation Council (Planning Council or Council). Transmission Services activities include line items for engineering, operations, and maintenance for Bonneville’s electric transmission system.

The mission of Bonneville is to create and deliver federal power and transmission services at the best value for its customers and constituents as it acts in concert with others to assure the Pacific Northwest has the following: (1) an adequate, efficient, economical, and reliable power supply; (2) an open access transmission system that is adequate for integrating and transmitting power from federal and non-federal generating units, providing service to Bonneville’s customers, providing interregional interconnections, and maintaining electrical reliability and stability; and (3) mitigation of the impacts on fish and wildlife from the federally owned hydroelectric projects from which BPA markets power.

Bonneville’s vision is to be an engine of the Northwest’s economic prosperity and environmental sustainability by advancing a Northwest power and transmission system that is a national leader in providing high reliability, low rates consistent with sound business principles, responsible environmental stewardship, and accountability to the region, all through a commercially successful business. Bonneville pursues this vision consistent with its four core values of safety, trustworthy stewardship, collaborative relationships, and operational excellence.

### **Legislative History**

The Bonneville Project Act of 1937 provides the statutory basis for Bonneville’s power marketing responsibilities and authorities. In 1974, passage of the Federal Columbia River Transmission System Act (Transmission Act) applied provisions of the Government Corporation Control Act (31 U.S.C. §§ 9101-9110) to Bonneville. The Transmission Act provides Bonneville with “self-financing” authority, establishes the Bonneville Fund (a permanent, indefinite appropriation) allowing Bonneville to use its revenues from electric power and transmission ratepayers to fund all programs without further appropriation, and authorizes Bonneville to sell bonds to the U.S. Treasury. As of the end of FY 2019, Bonneville has revolving U.S. Treasury borrowing authority of \$7.7 billion of which approximately \$2.4 billion remains available to be drawn.

The 1980 enactment of the Pacific Northwest Electric Power Planning and Conservation Act (Northwest Power Act) expanded Bonneville's authorities, obligations, and responsibilities. The purposes of the act include the following: to encourage electric energy conservation to meet regional electric power loads placed on Bonneville; to develop renewable energy resources within the Pacific Northwest; to assure the Northwest an adequate, efficient, economical, and reliable power supply; to promote regional participation and planning; and to protect, mitigate, and enhance the fish and wildlife of the Columbia River and its tributaries. The Northwest Power Act also established a revised statutory framework for Bonneville's administrative rate-setting process and established judicial review of Bonneville's final actions in the U.S. Court of Appeals for the Ninth Circuit.

### **Strategic Direction**

In early 2018, Bonneville released its 2018-2023 Strategic Plan which describes how it will operate in a commercially successful manner while meeting its statutory obligations. Bonneville developed this strategic plan after listening to customers and constituents express their interests in Bonneville's commercial viability and ability to meet those obligations. The strategic plan was developed at the point when Bonneville was midway through 20-year firm power sales contracts with its preference power customers. Those customers continue to evaluate how Bonneville will be positioned to meet their needs beyond the terms of their current contracts. The strategic plan is framed by these goals:

- Strengthen financial health
- Modernize assets and system operations
- Provide competitive power products and services
- Meet transmission customer needs efficiently and responsively

### **Financial Plan**

Also in 2018, Bonneville completed its Financial Plan to complement the objective in the strategic plan to strengthen its financial health. The 2018 Financial Plan establishes a guiding framework for decision-making by defining the financial constraints within which Bonneville operates, and outlines objectives to establish Bonneville's financial health. The plan contains Bonneville's statutory obligations and authorities, financial policies and established practices, and financial health objectives.

Pursuant to the Financial Plan, Bonneville adopted two specific policies. The Financial Reserves Policy defines the level of financial reserves Bonneville and each business line should hold; how to build financial reserves when they fall below a prescribed level; and a process to consider repurposing financial reserves when they exceed a prescribed level. The policy provides a framework to ensure Bonneville maintains a minimum of 60 days cash on hand for each business line and 90 days for the Agency.

The Leverage Policy creates a strategy to reduce Bonneville's total debt compared to its assets in an effort to strengthen financial health and flexibility. Reducing debt will help Bonneville lower its interest costs, support its strong credit rating, maintain access to borrowing from the U.S. Treasury, and improve financial strength and flexibility.

### **Cost Management**

Prior to each rate case, Bonneville conducts an Integrated Program Review (IPR) with customers and interested regional parties. The 2018 IPR examined all of Bonneville's cost categories attempting to bring program cost increases to below the level of inflation. This included categories of spending often considered inflexible, such as fish and wildlife and the operating costs of generating assets.

With the renewed focus from the strategic plan, the 2018 Integrated Program Review resulted in significant program cost reductions. Bonneville's final projected agency program costs for fiscal years 2020 and 2021 are \$66 million lower per year compared to the BP-18 rate period, mostly due to cost reductions in Power Services. The final program costs achieve Bonneville's goal staying at or below the rate of inflation, and also exceed the goal decreasing Bonneville's costs in nominal terms.

### **Fiscal Year 2020 and 2021 Rates**

BPA released the BP-20 Final Record of Decision on July 25, 2019, covering both power and transmission rates for Fiscal Years 2020 and 2021. FERC granted interim approval to the proposed rates on September 30, 2019. For the average base

power rate, there was no increase from BP-18. The base power rate does not include the potential impact of the Financial Reserves Policy (FRP) surcharge for power. Consistent with the FRP that was implemented in the 2020 Power Rate Schedules and General Rate Schedule Provisions, BPA has notified Power customers that the FRP Surcharge has been triggered for the full amount of \$30 million based on the end of FY 2019 results, and this will recover the full amount by the end of FY 2020. The surcharge means power customers will see a rate increase of 1% to 2%, depending on the product they receive. For transmission rates, the weighted average increase is 3.6 percent for the two-year rate period, consistent with the settlement agreed upon during the rate proceeding. The BP-20 rates will be in effect through September 30, 2021.

### **Program Performance**

To validate and verify program performance, Bonneville conducts various internal and external reviews and audits. Bonneville conducts extensive reviews with regional stakeholders of both capital and expense programs. In addition, Bonneville's programmatic activities are subject to review by Congress, the U.S. Government Accountability Office (GAO), the DOE's Inspector General, and other governmental entities. Bonneville's financial statements are audited annually by an independent external auditor. Bonneville has received unqualified audit opinions since the mid-1980s and no material weaknesses have been identified in controls over financial reporting.

### **Financial Mechanisms**

Bonneville's program is treated as mandatory and nondiscretionary. Bonneville is "self-financed" from its own revenues and does not rely on annual appropriations from Congress. Under the Transmission Act, Bonneville funds the expense portion of its budget and repays the federal investment with revenues from electric power and transmission sales. Bonneville's revenues fluctuate for a variety of reasons, including in response to variations in market prices for fuels and stream flow in the Columbia River System caused by variations in weather conditions and fish mitigation needs. Through FY 2019, Bonneville has returned approximately \$35.8 billion to the U.S. Treasury, of which about \$3.8 billion was for payment of FCRPS operation and maintenance (O&M) and other costs, \$16.2 billion for interest, and \$15.7 billion for amortization of appropriations and bonds.

In the FY 2021 Budget, the term Bonneville "bonds" refers to the debt instruments under which Bonneville receives advances of funds from the U.S. Treasury. This reference is consistent with section 13(a) of the Transmission Act, which defines "bonds" as all bonds, notes, and other evidences of indebtedness issued and sold by Bonneville to the U.S. Treasury.

In May 2019, debt instruments issued by non-federal entities but secured by payment and other financial commitments provided by Bonneville received the following credit ratings: Moody's at Aa1 with a negative outlook, Standard & Poor's at AA- with a stable outlook, and Fitch at AA with a stable outlook.

Bonneville and the U.S. Treasury have a comprehensive banking arrangement that covers Bonneville's short- and long-term federal borrowings. This provides Bonneville with the ability to borrow from the U.S. Treasury to finance capital investments and, on a short-term basis, to cover Northwest Power Act-related operating expenses. This latter ability provides Bonneville with much needed liquidity to help manage within-year cash flow needs and mitigate risk. Access to this use of U.S. Treasury borrowing authority has been incorporated into and relied upon in Bonneville's rate-setting process.

### **U.S. Treasury Payments and Budget Overview**

Bonneville's FY 2019 payment to the U.S. Treasury was approximately \$1.1 billion. This was the 36<sup>th</sup> consecutive year that Bonneville made its scheduled payments to the U.S. Treasury on time and in full. The payment included \$734 million in principal, which included \$228 million in early retirement of higher interest rate U.S. Treasury debt, \$232 million for interest, \$56 million in irrigation assistance payments, and \$41 million in pension and post-retirement benefits. Total credits associated with fish mitigation and recovery that are applied toward Bonneville's U.S. Treasury payment were about \$98.2 million for FY 2019. These credits are established and applied under section 4(h)(10)(C) of the Northwest Power Act. The FYs 2020 and 2021 U.S. Treasury payments are currently estimated at \$624 million and \$689 million, respectively. The FY 2020 and 2021 4(h)(10)(C) credits are estimated to be \$86.2 million and \$86.9 million, respectively.

Estimates of interest and amortization levels for outyear U.S. Treasury payments are included in the FY 2020-2021 final transmission and power rates. Bond and Appropriations Interest will continue to be revised based on upcoming capital investments and debt management actions. These estimates may change due to revised capital investment plans and



actual U.S. Treasury borrowing. In recent years, Bonneville has made amortization payments in excess of those scheduled in its FERC-approved rate filings resulting in a balance of advance repayment. The cumulative balance of advance amortization payments as of the end of FY 2019 was about \$5,791 million.

Bonneville has direct funding arrangements to fund the power-related portion of O&M and capital investments at the Corps and Reclamation facilities as well as the O&M costs of the U.S. Fish and Wildlife Service Lower Snake River Compensation Plan facilities. Direct funded Associated Projects capital costs, which had been funded exclusively through appropriations to the Corps and Reclamation prior to the initiation of direct funding, are now funded primarily from the proceeds of bonds issued by Bonneville to the U.S. Treasury. Certain power prepayments have also been a source of funds for direct funding. Bonneville's aggregate direct funding provided for capital and O&M was \$617.2 million in FY 2019.

Starting in FY 2014, Bonneville and Energy Northwest, the Washington state joint operating agency that owns and operates the Columbia Generating Station nuclear plant, have been working together to implement a new phase of integrated debt management for their combined total debt portfolios. The debt service of these portfolios is borne by Bonneville and recovered from Bonneville ratepayers through Bonneville's rates. Energy Northwest-related debt, as refinanced under this effort, is called Regional Cooperation Debt.

An important component of Regional Cooperation Debt is the issuance of new bonds by Energy Northwest to refund outstanding bonds shortly before their maturities when substantial principal repayments are due. An equal amount of higher interest rate Federal debt will be repaid instead. The net effect of refunding Regional Cooperation Debt and prepaying higher interest rate federal obligations is that the weighted-average interest rate of Bonneville's overall debt portfolio has been and will be reduced. In addition, Bonneville's aggregate principal balance of debt outstanding (federal and non-federal) does not and will not increase by virtue of the Regional Cooperation Debt program.

In FY 2018, BPA proposed an extension of the Regional Cooperation Debt program. This would extend the program through 2030 and involve up to \$3.5 billion of tax-exempt debt. This extension would be similar to the current Regional Cooperation Debt program in many ways but the proceeds could be used to prepay federal bonds or directly used for capital investments. The Energy Northwest Board approved this proposal on September 27, 2018.

#### **Power Prepayment Program**

Bonneville undertook a Power Prepayment Program in FY 2013 under which all Bonneville preference customers had an opportunity to submit formal offers to provide lump-sum payments to Bonneville as prepayments of a portion of their power purchases through September 30, 2028, the termination date of their current Long-Term Regional Dialogue Power Sales Contracts. Bonneville accepted power prepayments from four preference customers, as described below.

Upon Bonneville's receipt of the agreed-to, lump-sum prepayments, the selected preference customers became entitled to future portions of their electricity from Bonneville without further payment. The power prepayments are and will be recognized in the customers' future power bills from Bonneville as fixed, equal monthly prepayment credits. In effect, the amount of electricity that is prepaid may vary by month, depending on Bonneville's power rates and rate schedules that apply to electricity purchases by the prepaying customers in the related month. Because this is structured as a variable amount of prepayment and not as a fixed-price/fixed-amount type of prepayment, Bonneville maintains flexibility to establish rates for the electric power that is prepaid.

As a result of the FY 2013 Prepayment solicitation, Bonneville received \$340 million in prepayments, which Bonneville is using to fund needed FCRPS investments. The aggregate prepayment credits are set at \$2.55 million per month through FY 2028.

Depending on a variety of factors it is possible that Bonneville may seek to implement later phases of the Power Prepayment Program in connection with future FCRPS hydroelectric investment needs.

#### **Asset Management**

The foundation of Bonneville's value is the base of the generating resources from which it markets electricity, and Federal transmission assets it owns and operates. Bonneville utilizes an asset management strategy to apply best-practice industry standards to manage the lifecycle costs of Federal assets. This is central to maintaining the long-term value and reliability of

the power and transmission systems. Achieving these objectives for power requires collaborative, long-term planning with Bonneville's Federal partners, the Corps and Reclamation. Through the Asset Investment Excellence Initiative, the three agencies are establishing a long term asset investment plan, applying prioritization tools to inform investment decisions to ensure the long term affordability and reliability of the hydropower assets.

Bonneville Power Administration operates within a complex environment that requires asset management tradeoffs. Our business decisions consider five dimensions of risk: financial, reliability, compliance, safety and environmental. Reliability and safety remain Transmission priorities. Transmission's asset management capability is continually maturing and its competencies will enable the modernization of assets to help BPA maintain competitive advantage in the marketplace, enable industry change and deliver on public responsibilities; as well as strengthen financial health through the management of lifecycle costs and asset value.

### **Infrastructure Investments**

The FCRPS is one of the nation's largest nearly carbon-free power systems, and preserving and enhancing the value of the FCRPS for the future continues to be a major Bonneville focus. Bonneville's ongoing prioritization and execution of capital investment in transmission and FCRPS generation assets is the foundation for delivering clean, low cost power to support the communities and economies of the region well into the future.

Bonneville has experienced significant growth within its balancing area in installed variable renewable generation, primarily in the form of wind generation. Since 2001, installed wind generation connected to Bonneville's transmission system has grown from 115 MW to 4,785 MW through September 2019. Of the 4,785 MW of connected wind, 2,766 MW is currently in Bonneville's Balancing Authority Area (BAA). Wind is a non-dispatchable source of energy, meaning it cannot be relied upon for capacity. As such the substantial increase results in uncertainties in balance between load and generation required for maintaining a reliable grid. Bonneville has implemented and continues to study operational tools for integrating variable resources more cost effectively and reliably. Since the peak of installed wind in September 2017, the reduction has been a result of wind plants leaving the Bonneville BAA. Although the amount of variable generation has been reduced, these projects are still physically connected to Bonneville's system and continue to impact daily operations. Off-setting the wind leaving Bonneville's BAA is the possibility that a large amount of utility scale solar photo-voltaic (PV) projects are being added to Bonneville's queue. There is currently just under 8 MW of solar generation integrated into the Bonneville BAA. Bonneville, however, is currently studying approximately 3,500 MW of solar interconnection requests. Solar, like wind, is a variable generation source, but its characteristics are different than wind. As such Bonneville will continue to study and manage this new generation type for operations and cost recovery.

Consistent with the FY 2018, FY 2019, and FY 2020 Budget Requests, the FY 2021 Budget Request maintains the proposal that the Federal government be authorized to sell the transmission assets of Bonneville.

Bonneville continues to assess needed infrastructure investments in the Pacific Northwest to meet transmission capacity and reliability needs and continues to support a competitive wholesale market in the Western Interconnection, which encompasses 14 western states, two Canadian provinces, and one Mexican state.

Bonneville has completed three major transmission lines since 2011 (i) the McNary-John Day 500kV line—completed in FY 2012 —adding 79 miles, (ii) the Big Eddy-Knight 500kV transmission line and substation project resumed construction in 2014 and was energized in November 2015, adding 28 miles, and (iii) the Central Ferry-Lower Monumental 500kV Reinforcement which began construction in May 2014 and was also energized in November 2015, adding 38 miles. Bonneville also completed the modernization of the Celilo Converter Station at the northern end of the 846-mile Pacific Direct Current Intertie. The station was energized in January 2016. Additionally, 265 miles of direct current line were upgraded to match the capacity of the station upgrade.

Bonneville signed two agreements to participate with two investor-owned utilities in the environmental work and permitting for another transmission project, the proposed Boardman-to-Hemingway 500kV line; the initial agreements were executed in FY 2012 and subsequently amended in FY 2018. Participation in this preliminary review keeps Bonneville's options open for serving its six southeast Idaho preference customers following the termination of legacy transmission service agreements. Bonneville has not made a decision to co-develop or purchase capacity in this project. On January 17, 2014, Public Law 113-76 was enacted, which provided Bonneville with expenditure authority approval to

construct or participate in the construction of a transmission line to southeast Idaho, should Bonneville decide to continue pursuing that service arrangement.

On May 18, 2017, Bonneville announced its decision to not build the I-5 Corridor Reinforcement Project. Bonneville continues to work with constituents and stakeholders to study more cost effective options to mitigate the current transmission limitations along this path. Cumulative capitalized costs associated with this project of \$130.0 million were reclassified in fiscal year 2017 from Construction work in progress to a Regulatory asset on the Combined Balance Sheets, as these costs are expected to be recovered through future rates, beginning in FY 2020.

Bonneville continues to evaluate additional transmission investments and alternative non-wires solutions across the Pacific Northwest to improve reliability and support both load and renewable generation needs.

Bonneville makes use of certain alternative capital financing mechanisms, in addition to or in lieu of the use of its U.S. Treasury borrowing authority, to sustain funding for its infrastructure investment requirements. These approaches include revenue and financial reserves financing some amount of transmission investments, or seeking, when feasible, third party financing sources. See the BP-5 Potential Third Party Financing Transparency table in the budget schedules section of this document. This FY 2021 Budget contains \$15 million of annual financial reserves financing in FY 2019 for transmission infrastructure capital, which is included under Projects Funded In Advance.

Bonneville plays a key role in advancing energy efficiency across the region consistent with its statutes, including developing and promoting related technologies, and exploring demand-side management opportunities.

Bonneville is making disciplined technology innovation investments and looking to apply new operational and market mechanisms that enhance the reliability, efficiency, and flexibility of system operations.

#### **Revised Transmission Tariff**

In 2018, Bonneville engaged in settlement discussions with transmission customers to reach consensus on terms and conditions for a new Bonneville transmission tariff as well as gain agreement from those customers to convert their current contracts to the new tariff when it becomes effective. Bonneville presented its need for a modernized tariff that can be modified over time so that the region can take advantage of opportunities in the rapidly changing industry as well as further its objectives for improving the agency's commercial performance. This resulted in a settlement package that includes a TC-20 Settlement Agreement on the tariff terms and conditions and a BP-20 Partial Transmission Rates Settlement Agreement that settles transmission and ancillary and control area services rates. Bonneville's Fiscal Year 2020 and 2021 rate decision included the transmission, and ancillary and control area services rates agreed upon in the settlement.

#### **Grid Modernization**

Bonneville continues a cross-agency grid modernization initiative. Bonneville's reliance on legacy systems and non-standard commercial practices are costly to maintain and have led to being conservative in its power and transmission operations, planning, and marketing.

Grid modernization involves improving and modernizing transmission and generation system visibility and controls, and increasing the electricity market skills of Bonneville employees. The grid modernization initiative focuses on five areas of effort:

- Operational modernization
- Commercial modernization
- Energy Imbalance Market implementation
- Mission critical information technology improvements
- Improvements to core business practices

Part of the grid modernization scope is Bonneville's evaluation of joining the Western Energy Imbalance Market (EIM) and enabling Federal and non-federal resources in its service area to access that market. Joining the EIM could optimize the day-to-day operation of the power system and leverage hydropower in a market increasingly driven by intermittent renewable resources. Bonneville conducted monthly public meetings to include its customers and regional constituents in its

evaluation of the EIM as it signed a Western EIM Implementation Agreement with the California Independent System Operator that signals the beginning of work on projects that need to be completed before BPA could start EIM operations.

### **The Columbia River System Operations**

The U.S. Army Corps of Engineers, Bureau of Reclamation and Bonneville Power Administration have announced their intent to prepare an environmental impact statement (EIS) on the Columbia River System operations (CRSO) and configurations for 14 federal projects in the interior Columbia Basin. In this Columbia River System Operations EIS, the three agencies will present a reasonable range of alternatives for long-term system operations and evaluate the potential environmental and socioeconomic impacts on flood risk management, irrigation, power generation, navigation, fish and wildlife, cultural resources and recreation.

The on-going action that requires evaluation under NEPA is the long-term coordinated management of the System projects. An underlying need to which the co-lead agencies are responding is reviewing and updating the management of the System, including evaluating measures to avoid, offset, or minimize impacts to resources affected by the management of the System in the context of new information and changed conditions in the Columbia River basin. In addition, the co-lead agencies are responding to the Opinion and Order issued by the U.S. District Court for the District of Oregon such that this EIS will evaluate how to insure that the prospective management of the System is not likely to jeopardize the continued existence of any endangered species or threatened species or result in the destruction or adverse modification of designated critical habitat, including evaluating mitigation measures to address impacts to listed species. The EIS will evaluate actions within the co-lead agencies' current authorities, as well as certain actions that are not within the co-lead agencies' authorities, based on the District Court's observations about alternatives that could be considered and comments received during the scoping process. The EIS will also allow the co-lead agencies and the region to evaluate the costs, benefits and tradeoffs of various alternatives as part of reviewing and updating the management of the System.

### **Fish and Wildlife Program Overview**

Bonneville is committed to funding its share of the region's efforts to protect and mitigate Columbia River Basin fish and wildlife. To the extent possible, Bonneville is integrating actions to protect species listed for protection under the Endangered Species Act (ESA) in response to the FCRPS Biological Opinions (BiOps), including the National Oceanic and Atmospheric Administration (NOAA) Fisheries Willamette River BiOp and the United States Fish and Wildlife Service's (USFWS) 2006 Libby Dam BiOp, with projects implemented consistent with the Council's Fish and Wildlife Program (Program). The Program, BiOps, and long-term agreements include prioritized strategies for mitigation actions to meet Bonneville's environmental compliance responsibilities under the ESA, Northwest Power Act, and other laws. Together, all of these efforts contribute to sustaining and advancing the region's resilience.

Included with the budget schedules section of this document is the current tabulation of Bonneville's fish and wildlife costs from FY 2009 through FY 2019.

### **The Columbia River Treaty**

The U.S. Government reached consensus on a high level position for negotiations of the post-2024 future of the Columbia River Treaty in June 2015, and received authorization to negotiate with Canada on the Columbia River Treaty in October 2016. Government Affairs Canada notified the United States State Department in December 2017 of Canada's mandate to negotiate the Columbia River Treaty with the United States. Negotiations began in spring 2018 and continue to date. Both the U.S. Department of State and Canadian negotiators have discussed shared objectives and exchanged information on flood risk management, hydropower and ecosystem considerations. The United States and Canada postponed the ninth round of negotiations to modernize the Columbia River Treaty regime, which were originally scheduled for November 19-20, 2019 in Washington, D.C. The United States' negotiating team would like additional time to complete preparations, with the aim of maximizing the productivity of the bilateral discussions. The next round of negotiations is scheduled for March 2020.

### **Radio Spectrum Communications**

Bonneville's wireless communication system is used to operate and control critical national transmission grid infrastructure in a reliable, secure, and safe manner. Bonneville's communication systems are designed to meet strict reliability/availability objectives required by NERC and Western Electricity Coordinating Council (WECC) standards. Concerning proper spectrum stewardship, Bonneville designs highly efficient radio systems that use minimal radio

frequency (RF) channel bandwidths to meet critical mission needs. However, in certain circumstances, efficiently designed spectrum radio systems will require broad RF channels and/or lower state RF modulation schemes to meet existing and future requirements in order to meet operational and reliability/availability objectives.

In order to meet Bonneville's mission/operational requirements, RF communication equipment approved for system use goes through a rigorous evaluation and testing process. RF spectrum efficiency factors are considered during the evaluation/testing period. RF terminal equipment approved for use is normally purchased directly from vendors and is not typically supplied through a Request for Proposal process.

Bonneville's operational telecommunications and other capital equipment and systems are acquired using Bonneville's self-financing and procurement authorities. The Bonneville budget includes a system-wide electric reliability performance indicator, consistent with NERC rules, to track and evaluate performance.

Bonneville may share temporarily-available spare capacity on its RF communication system with other government agencies (both Federal and State), and with other electric utilities in the region whose power systems interconnect with Bonneville. Non-critical administrative traffic is typically supported by commercial carrier enterprises. However, to meet the North American Electric Reliability Corporation/-Western Electricity Coordinating Council (NERC/WECC) electrical bulk transmission requirements, Bonneville exclusively operates highly critical transmission control traffic over its private telecommunication system as Bonneville has no control over the reliability/availability of the commercial enterprise or on how quickly critical operational control circuits are restored to active service during an interruption.

For high capacity communication system applications, Bonneville considers and operates non-spectrum dependent alternatives such as fiber optic cable infrastructure systems.

During FY 2014, Bonneville began upgrading the Very High Frequency (VHF) land mobile system and installing a number of digital Synchronous Optical Network (SONET) rings typically consisting of fiber segments in combination with point-to-point microwave hops operating in the 4 GHz and 7/8 GHz bands. These various telecommunication systems operate within Bonneville's approximate 300,000 square mile regional utility service territory (Oregon, Washington, Idaho, western Montana) with the majority of the RF infrastructure located in low population-rural areas.

The FCRPS hydroelectric projects, owned by the Corps and Reclamation, also utilize federal radio spectrum to preserve very high operational telecommunications and power system reliability.

In FY 2014, Bonneville completed work costing approximately \$40 million, funded through the Spectrum Relocation Fund, to relocate its operational telecommunication systems from the 1710-55 MHz radio spectrum bands to alternative federal radio spectrum bands, part of the AWS-1 Federal Spectrum Relocation. In accordance with Federal law, Bonneville plans to return the approximately \$8.2 million of excess funds to the U.S. Treasury, via the Spectrum Relocation Fund, as soon as the National Telecommunications and Information Administration (NTIA) officially notifies the Federal Communications Commission (FCC) that the DOE relocation effort is complete.

Bonneville began participating in a new spectrum relocation effort in FY 2015 to relocate its operational telecommunication systems from the 1755-80 MHz radio spectrum bands. The NTIA has approved and, in July 2014, web-posted federal agency relocation plans, including the Bonneville relocation plan. The FCC held an auction of this spectrum on November 13, 2014. Bonneville received an additional \$5.2 million from the Spectrum Relocation Fund on July 29, 2015 to fully pay for this new relocation effort, including, as in the prior relocation, the purchase and installation of new digital radio equipment. Bonneville received obligational authority to proceed with this relocation effort by apportionment on July 24, 2015.

Bonneville has worked to complete its move off of 1755-80 MHz in two stages. First, Bonneville moved off of the old federal frequencies and "retuned" to new alternate federal frequencies in the band segment of 1780-1850 MHz which is above the highest frequency that is involved in the auction. Three hops federal frequency moves/retuning were completed as of 6/7/2017. The last remaining path, Happy Camp to Hilltop in northern California near the Oregon California Border, was moved/retuned, and as of 7/31/2018, Bonneville was off of the AWS-3 radio frequencies, meeting the commitment date promised to the NTIA. Bonneville still has additional work remaining to finish the construction related to the AWS-3 relocations. Bonneville will use the SRF relocation funds until the AWS-3 relocation work is completed and closed.

out. Second, Bonneville will complete its move of these four microwave hops to 7GHz-8GHz. This will take additional time because two of four hops require building construction to complete the work. AWS-3 funds will need to be retained by Bonneville at least through FY 2022 to complete construction of two communications buildings. Construction at the Glass Butte site may not occur until FY 2021. The construction of the new control house at Richland Substation is on a similar timeline as the Glass Butte project. The building construction will likely occur in FY 2020 with cutovers to the new radio equipment and retirement of old radio equipment likely concluding in FY 2021. Bonneville will assure that “comparable capability” has been achieved for these four AWS-3 relocated Bonneville operational telecommunication hops.

### **Educational Activities**

Bonneville is a supporter of science, technology, engineering, and math (collectively known as “STEM”) education programs. These programs provide support and encouragement to middle and high school students to study the sciences in school and to pursue careers in these fields. Working with Bonneville employees as volunteer ambassadors, the Bonneville education program provides value-added presentations, curricula, and activities to K-12 schools that enhance the learning experience for students and teachers, and extend awareness of the value of the region’s hydroelectric system to future generations. As a regional leader in STEM education, Bonneville also proudly supports and organizes an award-winning Science Bowl. Bonneville also sponsors Science Fair competitions for students in Washington State, as well as a First Robotics tournament championship.

### **Budget Estimates and Planning**

This FY 2021 Budget proposes estimated accrued expenditures of \$2,978 million for operating expenses, \$66 million for Projects Funded in Advance (PFIA), \$800 million for capital investments, and \$402 million for capital transfers in FY 2021.

The estimated spending levels in this budget are still subject to change to accommodate competitive dynamics in the region’s energy markets, debt management strategies, continuing changes in the electric industry, and other factors.

This FY 2021 Budget includes capital and expense estimates based on final approved spending proposals from Bonneville’s 2018 final Integrated Program Review (IPR). FY 2019 costs are based on Bonneville’s FY 2019 audited financial statements. Consistent with the FY 2020 Budget Request, the FY 2021 Budget Request maintains the proposal that the Federal government be authorized to sell the transmission assets of Bonneville. The FY 2021 budget request also includes a proposal to change BPA’s statutory rate structure requirements from cost recovery to a market based structure that takes into consideration rates charged by comparable utilities and which could allow for faster recoupment of the taxpayer investment.

Capital investment levels reflect Bonneville’s capital asset management process and external factors such as changes affecting the West Coast power and transmission markets, along with planned infrastructure investments designed to address the long-term needs of the region and national energy security goals.

Bonneville utilizes a structured capital project selection process requiring submission of a standardized business case for review. Each business case consists of a description of the project, a clear statement of objectives, description and mitigation of risks, and a rigorous analysis of project costs and benefits including a status quo assumption and preferred alternatives. In addition, both annual and end-of-project targets are set for each project covering cost, scope, and schedule. Progress reports on these targets are provided to Bonneville’s senior executives at least quarterly.

The FYs 2020-2025 revenue estimates in this budget, included in the Net Outlay formulation, are calculated consistent with cash management goals. The revenue estimates reflect assumed adjustments, which include the use of a combination of tools, including upcoming rate adjustment mechanisms, reduced cost estimates, a net revenue risk adjustment, debt management strategies, and/or short-term financial tools to manage net revenues and cash. The revenue estimates also include depreciation and U.S. Treasury repayment credit assumptions. These U.S. Treasury repayment credits offset, among other things, Bonneville’s fish and wildlife program costs allocable to the non-power project purposes of the FCRPS, as provided under section 4(h)(10)(C) of the Northwest Power Act.

### **Overview of Detailed Justifications**

In Bonneville’s Detailed Justification Summaries, accrued expenditure is the basis of presenting Bonneville’s program funding levels in the power and transmission rate making processes and the basis upon which Bonneville managers control

their resources to provide products and services. Accrued expenditures relate period costs to period performance. Traditional budget obligation requirements for Bonneville's budget are assumed on the Program and Financing Summary Schedule prepared in accordance with Office of Management & Budget Circular A-11.

The organization of Bonneville's FY 2021 Budget and these performance summaries reflect Bonneville's business services basis for its utility enterprise activities. Bonneville's major areas of activity on a consolidated budget and accounting basis include power and transmission, with administrative costs included. Power Services includes line items for Fish and Wildlife, Energy Efficiency, Residential Exchange Program, Associated Projects O&M Costs, and the Northwest Power Council. Environmental activities are shown in the relevant Power Services and Transmission Services sections, as are reimbursable costs. Bonneville's interest expense, pension and post-retirement benefits, and capital transfers to the U.S. Treasury are shown by program.

The first section of performance summaries, Capital Investments, includes accrued expenditures for investments in electric utility and general plant associated with the FCRPS generation and transmission services, fish and wildlife, and capital equipment. These capital investments are estimated to require budget obligations and expected use of \$800 million in bonds to be issued and sold to the U.S. Treasury in FY 2021.

The near-term forecast of capital funding levels has undergone an extensive internal review as a result of Bonneville's development of asset management plans. These plans encompass project cost management initiatives, capital investment assessments, and categorization of capital projects to be funded based on risk and other factors. Consistent with Bonneville's near-term asset planning process and Bonneville's standard operating budget process, this FY 2021 Budget includes updated capital investment levels for FY 2020. Utilizing this review process helps Bonneville in its efforts as a participant in wholesale energy markets. Bonneville will continue to work with the Corps and Reclamation to optimize the mix of projects.

The second section of Bonneville's performance summaries, entitled Annual Operating Expenses, includes accrued expenditures for services and program activities financed by power sales revenues, transmission sales revenues, and projects funded in advance. For FY 2021, budget expense obligations are estimated at \$2,978 million. The total program requirements of all Bonneville programs include estimated budget obligations of \$4,246 million in FY 2021.

#### **Evidence and Analysis in the Budget**

Bonneville has undertaken several initiatives and processes to determine appropriate budget expenditures.

Bonneville's Integrated Program Review (IPR) process allows interested parties to see all relevant FCRPS expense and capital spending level estimates in the same forum. In addition, Bonneville's IPR process allows interested parties to review and comment on Bonneville's Strategic Asset Management Plans (SAMPs) and 10-year capital forecasts. The IPR occurs every two years, or just prior to each rate case, and provides participants with an opportunity to review and comment on Bonneville's program level estimates prior to spending levels being set for inclusion in rate cases. BPA concluded the 2018 IPR in summer 2018, which reviewed spending plans for the FY 2020 and 2021 rate period.

Bonneville is focused on institutionalizing operational excellence – continuous improvement that produces more efficient and effective ways to deliver on Bonneville's mission and vision. In FY 2017, the Business Transformation Office (BTO) was implemented in order to ensure that Bonneville's transformational initiatives, including its Key Strategic Initiatives (KSIs), are executed in the most efficient manner, from a time, cost and resource perspective. Over the next few years, Bonneville will focus on its single KSI Grid Modernization effort. Grid Modernization is a set of projects to advance the way BPA markets and operates the federal power and transmission systems, so that Bonneville can benefit from new technology and emerging market opportunities. It includes new state awareness tools, digital technologies and process automation to help us identify additional capacity, increase revenues and improve reliability. This work is critical to ensuring BPA's long-term commercial success and competitiveness. This effort is intended to unlock hydropower and transmission capacity. Today, BPA holds back a couple hundred megawatts of hydropower in reserve every hour because we have limited visibility into what is actually happening on our system in real-time. We also hold out transmission capacity because of this uncertainty. Grid modernization will give us the tools and system visibility we need to reduce the uncertainty, unlock capacity and increase revenues.

**Judicial and Regulatory Activity**

The Energy Policy Act of 2005 authorized the Federal Energy Regulatory Commission (FERC) to approve and enforce mandatory electric reliability standards with which users, owners, and operators of the bulk electric power system, including Bonneville, are required to comply. These standards became enforceable on June 18, 2007, and compliance is monitored by the North American Electric Regulatory Corporation (NERC) and the regional reliability organizations.



**Power Services - Capital  
Funding Schedule by Activity**

**Funding (\$K)**

**Power Services – Capital**  
 Associated Project Costs  
 Fish & Wildlife  
**Total, Power Services – Capital**

FY 2019 Actual	FY 2020 Estimate	FY 2021 Estimate	FY 2021 vs FY 2020	
			\$	%
199,661	238,000	256,000	18,000	7.6%
22,313	47,266	47,266	0	0.0%
<b>221,974</b>	<b>285,266</b>	<b>303,266</b>	<b>18,000</b>	<b>6.3%</b>

**Outyears (\$K)**

**Power Services – Capital**  
 Associated Project Costs  
 Fish & Wildlife  
**Total, Power Services - Capital**

FY 2021 Estimate	FY 2022 Estimate	FY 2023 Estimate	FY 2024 Estimate	FY 2025 Estimate
256,000	281,000	300,000	306,000	313,000
47,266	43,000	43,000	40,000	40,000
<b>303,266</b>	<b>324,000</b>	<b>343,000</b>	<b>346,000</b>	<b>353,000</b>

## **Program Overview**

Associated Project Costs provide for direct funding of additions, improvements, and replacements of existing Reclamation and Corps hydroelectric projects in the Pacific Northwest. The FCRPS hydro projects produce a large portion of the electric power that is marketed by Bonneville.

Maintaining the availability and increasing the efficiency of the FCRPS is critical to ensuring that the region has an adequate, efficient, economic, and reliable power supply. The FCRPS represents about 80 percent of Bonneville's firm power supply and includes 31 operating federal hydroelectric projects with over 200 generating units. These projects have an average age of about 50 years, with some that exceed 60 years of age. Through direct funding and the cooperation of the Corps and Reclamation, Bonneville uses its U.S. Treasury borrowing authority and other sources to make investments needed to restore generation availability and improve efficiency, reducing demand on Corps and Reclamation appropriations for power-related investments.

Since the beginning of Direct Funding in 1997, BPA has invested over \$2 Billion in Direct Capital in the Federal Columbia River Power System with the goal of maximizing system value for the region and its stakeholders. Ongoing analysis with its operating partners, the Army Corps of Engineers and the Bureau of Reclamation, has identified ongoing investment needs for the foreseeable future in order to maintain the health of the hydro system.

These planned investments, included in the FY 2021 Budget estimates, will maintain the generation performance of the FCRPS. Moving forward with the cost-effective opportunities to expand the generation and to preserve and enhance the capability of the FCRPS is a smart, economic, and environmentally beneficial decision when compared to purchasing power from the wholesale power market to serve growing Pacific Northwest electricity needs of BPA customers.

Fish and wildlife capital costs incurred by Bonneville are directed at activities that mitigate Columbia River Basin fish and wildlife resources. Bonneville uses capital to fund projects designed to increase juvenile and adult fish passage through the federal hydrosystem, to increase fish production and survival through construction of hatchery, acclimation and fish monitoring facilities, and to increase wildlife and resident fish populations through land acquisitions and associated habitat maintenance. These capital projects support both Northwest Power Act and ESA priorities and are integrated with the Program in order to efficiently meet Bonneville's responsibilities under the Northwest Power Act and other statutes to mitigate federal hydrosystem impacts to Columbia River Basin fish and wildlife.

Bonneville implements such projects consistent with the Pacific Northwest Electric Power Planning Council's (Council) Columbia Basin Fish and Wildlife Program and the purposes of the Northwest Power Act. Under the Northwest Power Act, the Council must develop a Program that protects, mitigates, and enhances Columbia River Basin fish and wildlife affected by the federal and non-federal hydroelectric projects in the basin while assuring the Pacific Northwest an adequate, efficient, economical, and reliable power supply. The Program, the FCRPS BiOp, other BiOps, and Bonneville's long-term agreements include prioritized strategies for mitigation actions and projects to meet Bonneville's responsibilities under the Northwest Power Act, the ESA, the Federal Clean Water Act, and other laws. When issues arise that potentially trigger the *in lieu* provision of the Northwest Power Act, which prohibits Bonneville from funding mitigation that other entities are authorized or required to undertake, Bonneville works with the Council and the regional fish and wildlife managers, customers, and tribes, as appropriate, to ensure ratepayers fund only appropriate mitigation.

Most projects recommended by the Council also undergo independent scientific review as directed by the 1996 Energy and Water Appropriations Act, which added section 4(h)(10)(D) to the Northwest Power Act. As a result, the Council appoints an Independent Scientific Review Panel (ISRP) "to review a sufficient number of projects" proposed to be funded through Bonneville's annual fish and wildlife budget "to adequately ensure that the list of prioritized projects recommended is consistent with the Program." The Northwest Power Act further states that "in making its recommendations to Bonneville, the Planning Council shall consider the impact of ocean conditions on fish and wildlife populations; and shall determine whether the projects employ cost effective measures to achieve program objectives." Today, most mitigation projects funded by Bonneville receive ISRP review as part of the Council recommendation process. The Council uses a multi-year project review cycle during which the ISRP reviews categories of projects grouped together.

To comply with the ESA, Bonneville funds capital investment actions to avoid jeopardizing listed species. Guidance for those actions is found in the most recent BiOp issued by NOAA in 2019 and the USFWS BiOp in 2006/2010.

- In February 2006, USFWS issued a BiOp for Libby Dam on the Kootenai River for white sturgeon and bull trout. A subsequent Settlement Agreement between USFWS and the Center for Biological Diversity was memorialized by modifying the BiOp in 2008. Additional consultation is occurring as part of the larger USFWS bull trout consultation.
- In 2010 USFWS designated critical habitat for bull trout (following USFWS's issuance in 2000 of a BiOp for FCRPS impacts on bull trout). The Action Agencies (Corps, Reclamation, and Bonneville) are preparing a biological assessment covering FCRPS operational effects on bull trout and designated bull trout critical habitat.
- In May 2008, NOAA issued an FCRPS BiOp for 13 listed species of salmon and steelhead, supplemented in a 2010 Supplemental BiOp that incorporated the Action Agencies' Adaptive Management Implementation Plan, and further supplemented in a 2014 Supplemental BiOp. On January 17, 2014, NOAA released its 2014 Supplemental BiOp. In May 2016, the Federal District Court for the District of Oregon invalidated the BiOp on numerous grounds and found that the Corps and Reclamation violated the National Environmental Policy Act (NEPA) when they issued decision documents to implement the BiOp. The court ordered NOAA to complete a new BiOp by December 31, 2018, and ordered the Corps and Reclamation to complete a NEPA process in 2021. In an order issued April 3, 2017, the court ordered additional spill beginning in 2018 and continuing through the BiOp remand period; this order was upheld by the Ninth Circuit Court of Appeals on April 2, 2018. NOAA issued an interim BiOp March 2019 and the Action Agencies are now in consultations with NOAA on the next BiOp.
- In July 2008, USFWS and NOAA issued Willamette River BiOps to address impacts from 13 federal dams on salmon, steelhead, Oregon chub, and bull trout. Implementation of a BiOp measure related to hatchery fish in the McKenzie River was the subject of litigation in Federal District Court. The Action Agencies are currently engaged in discussions with NOAA related to BiOp implementation for downstream passage and for hatchery consultations.

Under these collective BiOps, the Action Agencies have committed to implement hydro, habitat, hatchery, and other actions throughout the Columbia River Basin to address impacts stemming from the operation of the federal hydro-electric dams on ESA-listed fish, and to ensure that operations of the federal dams do not jeopardize the continued existence of the ESA listed species or adversely modify their designated critical habitat.

The Action Agencies also signed the 2008 Columbia Basin Fish Accords (Fish Accords or Accords) with five Northwest Tribes and the states of Idaho and Montana. In 2009, an agreement was signed with the state of Washington and federal agencies (the state of Washington Estuary agreement). And in 2012, the Action Agencies signed an agreement with the Kalispel Tribe of Indians covering Albeni Falls Dam and FCRPS operations. Wildlife settlement agreements have been signed with the states of Oregon and Idaho to help complete mitigation for the flooding and inundation caused by the construction of FCRPS dams operating in those states. These Fish Accords and settlements complement the BiOps and provide firm commitments to prioritize mitigation actions and secure funding over the life of the agreements.

In October 2018, BPA and its federal partners Corps and Reclamation signed extension agreements with current Accords partners, namely certain states and tribes, to extend the Columbia Basin Fish Accords (2018 Fish Accord extensions). The existing agreements expired September 30, 2018, and were extended from October 2018 until September 30, 2022, at the latest. The extension agreements commit nearly \$450 million for fish and wildlife protection and mitigation, which is likely to result in future expenses or regulatory assets.

As noted above, BiOps, 2018 Fish Accord extensions, and wildlife settlement commitments are integrated along with other projects and implemented through the Program under the Northwest Power Act. They provide the basis for the Bonneville Fish and Wildlife Program's planned capital investment.

#### **Accomplishments**

- The BP-20 - Rate Case final record of decision was released July 25, 2019. FERC granted interim approval to proposed rates on September 30, 2019.

- 63,608 acres improved by various means via channel work, controlled burns, planting, removing invasive, restoring wetlands & floodplains, controlling erosion, no-till farming, etc.
- 731 miles of channels added, instream complexity improved, fenced, planted, noxious/invasive weeds removed
- 85,649 acres protected by land purchase or lease
- 36 miles of riparian habitat protected due to land purchase or lease
- 220 miles of habitat accessed due to instream passage improvements via removing diversions, dams, mine tailings, and installing fish passage structures screens
- 3,319 acre-feet/year of water protected due to installing fish screens
- 256,222 acre-feet of water improved due to protection & conservation via acquiring land and water, installing wells, pipelines, sprinklers, etc.
- 110 miles of stream improved due to protection & conservation via acquiring land and water, installing wells, pipelines, sprinklers, etc.
- Completed draft tube bulkhead refurbishment at John Day Dam
- Completed Hills Creek spillway gate rehabilitation, and digital governor replacements at Willamette Plants
- Completed powerhouse DC emergency lighting system installation at Libby Dam
- Completed DC and preferred AC upgrade at Chief Joseph Dam
- Completed unit 3 stator and cooler replacement at Dworshak Dam
- Completed powerhouse bridge crane skew control at McNary Dam
- Completed bridge crane rehabilitation at Little Goose Dam
- Completed bridge crane rehabilitation at Lower Granite Dam
- Completed breaker replacements at Lower Monumental Dam
- Completed turbine runner replacement at Palisades Dam
- Completed Units 8 and 9 governor replacements at Minidoka Dam

#### **Explanation of Changes**

Bonneville's budget includes \$303.3 million in FY 2021 for Power Services capital, which is a 6.3 percent increase from the FY 2020 forecasted level. The FY 2021 level reflects additional cost management efforts while continuing to align with BPA's strategic asset management plans which focus on the need for investment in the hydroelectric system assets and investments necessary to implement the BiOps, 2018 Fish Accord extensions, and other Columbia Basin Fish and Wildlife activities.

The FY 2021 budget increases the levels for Associated Projects (+\$18 million) while maintaining the same funding level for Fish & Wildlife, relative to FY 2020.

#### **Strategic Management**

Bonneville markets available electric power while supporting the achievement of its vital responsibilities for fish and wildlife, energy efficiency, renewable resources, and low-cost power in the Pacific Northwest region. Bonneville will continue to implement the following strategies to serve the region:

1. Bonneville coordinates its power operational activities with the Corps, Reclamation, NERC, regional electric reliability councils, its customers, and other stakeholders to provide the most efficient use of federal assets.
2. Ongoing work with the Corps and Reclamation is focused on improving the reliability of the FCRPS, increasing its generation efficiency, and optimizing hydro facility operation.
3. Bonneville is committed to funding efforts to protect listed fish and wildlife species in the Columbia Basin under the ESA and working closely with the Council, regional fisheries managers, and other federal agencies to prioritize and manage projects to mitigate fish and wildlife affected by the FCRPS.
4. Bonneville's utility customers have been, and continue to be, a critical part of Bonneville's collaborative efforts to promote and foster the efficient use of energy.
5. Bonneville has assisted with a DOE Wind Power crosscutting initiative to strengthen energy security.

The following external factors present the most significant risk and impact to overall achievement of the strategies listed above:

1. Continually changing regional economic and institutional conditions;
2. Competitive dynamics; and
3. Ongoing changes in the electric industry.

## Associated Projects

### Overview

Bonneville will work with both the Corps and the Reclamation to reach mutual agreement on budgeting and scheduling capital improvement projects that are cost-effective and provide system or site-specific enhancements, increase system reliability, or provide generation efficiencies.

The work is focused on improving the reliability of the FCRPS and on increasing its generation efficiency or capacity through turbine runner replacements, optimizing hydro facility operation, and new unit construction. Also, limited investments may be made in joint-use facilities that are beneficial to both the FCRPS operations and to other Corps and Reclamation project purposes.

### Corps of Engineers Projects

(\$K)		
FY 2019 Actual	FY 2020 Estimate	FY 2021 Estimate
160,790	123,071	117,963

#### *Bonneville Dam:*

- FY 2019. Completed powerhouse 2 roof replacement. Continued generator step up (GSU) transformer instrumentation, main unit breaker and station service reconfiguration, control room fire protection upgrades, oil water separator improvements, and tailrace gantry crane rehabilitation. Began generator fire protection.
- FY 2020. Complete GSU transformer instrumentation. Continue main unit breaker and station service reconfiguration, control room fire protection upgrades, oil water separator improvements, tailrace gantry crane rehabilitation, and generator fire protection projects.
- FY 2021. Complete control room fire protection upgrades and oil water separator improvements. Continue main unit breaker station service reconfiguration, tailrace gantry crane rehabilitation and generator fire protection projects.

#### *John Day Dam:*

- FY 2019. Completed station service transformer replacements and 500kV disconnect replacement. Continued emergency gantry crane replacement and SQ board replacement. Began powerhouse roof replacement, control room fire protection upgrades and trash rack crane replacement.
- FY 2020. Complete emergency gantry crane replacement. Continue heating, ventilating, air conditioning (HVAC) system upgrade, emergency gantry crane replacement, SQ board replacement, powerhouse roof replacement and trash rack crane replacement.
- FY 2021. Complete trash rack crane replacement. Continue HVAC system upgrade, emergency gantry crane replacement, SQ board replacement, and powerhouse roof replacement.

#### *The Dalles Dam:*

- FY 2019. Completed SR panel replacement. Continued transformer replacements, and fish unit breaker replacements.
- FY 2020. Complete fish unit breaker replacements. Continue transformer replacements. Begin emergency gantry crane rehabilitation.
- FY 2021. Complete transformer replacements. Continue emergency gantry crane rehabilitation.

#### *Willamette Plants:*

- FY 2019. Completed Foster bridge crane rehabilitation, Detroit spillway gate rehabilitation and turbine platform installations in the Willamette Valley. Continued Generic Data Acquisition and Control System (GDACS) installation across the Willamette Valley, intake gantry crane replacement at Big Cliff, and electrical reliability upgrades at Foster. Began fire detection, HVAC and life safety improvements at Dexter.
- FY 2020. Complete GDACS installation across the Willamette Valley, and Big Cliff intake gantry crane replacement. Continue electrical reliability upgrades at Foster, and fire detection, HVAC and life safety improvements at Dexter. Begin Dexter intake gantry crane and transformer replacements at Detroit.

- FY 2021. Continue electrical reliability upgrades at Foster, intake gantry crane at Dexter, and fire detection, HVAC and life safety improvements at Dexter. Continue transformer replacements at Detroit. Begin turbine and generator rehabilitation at Foster and main unit breakers and electric reliability upgrades at Green Peter.

*Albeni Falls Dam:*

- FY 2019. Completed station service switchgear replacement. Continued spillway gate modifications. Began installation of main unit transformers.
- FY 2020. Continue spillway gate modifications and installation of main unit transformers. Begin fire suppression upgrades.
- FY 2021. Continue spillway gate modifications, installation of main unit transformers and fire suppression upgrades.

*Libby Dam:*

- FY 2019. Completed hydropower critical spares warehouse. Continued intake gantry crane replacement and system control console replacement.
- FY 2020. Complete intake gantry crane replacement. Continue system control console replacement. Begin powerhouse gantry crane rehabilitation, DC boards and breakers system replacement, and security system upgrades.
- FY 2021. Complete security system upgrades. Continue system control console replacement, powerhouse gantry crane rehabilitation, and DC boards and breakers system replacement. Begin left abutment rock slide stabilization.

*Chief Joseph Dam:*

- FY 2019. Completed generator cooling system upgrades and DC and preferred AC upgrades. Began upgrades for station service units.
- FY 2020. Continue upgrades for station service units and intake gantry crane rehabilitation. Begin powerbus replacement, exciter replacements, fire suppression upgrades, and intake gantry crane rehabilitation.
- FY 2021. Complete intake gantry crane rehabilitation. Continue upgrades for station service units, powerbus replacement, exciter replacements, and fire suppression upgrades. Begin generator rewinds and cooling.

*Dworshak Dam*

- FY 2019. Continued exciter replacement, RO valve upgrades and tailrace crane rehabilitation. Began exciter replacements.
- FY 2020. Complete tailrace crane rehabilitation and RO valve upgrade. Continue exciter replacements.
- FY 2021. Complete exciter replacements.

*McNary Dam*

- FY 2019. Continued 4160-480V station service rehabilitation, drainage system oil water separator, spillway gate rehabilitation and turbine design and replacement. Purchased 230kV transformer. Began exciters upgrade, governor systems upgrade, levee drainage pump station upgrades, powerhouse control system upgrade, and station service units rehabilitation.
- FY 2020. Complete 4160-480V station service rehabilitation and drainage system oil water separator. Continue exciters upgrade, governor systems upgrade, levee drainage pump station upgrades, turbine design and replacement, spillway gate rehabilitation, powerhouse control system upgrade, and station service units rehabilitation. Begin intake gantry crane replacement and rehabilitation of spillway gates.
- FY 2021. Complete intake gantry crane replacement. Continue exciters upgrade, governor systems upgrade, levee drainage pump station upgrades, turbine design and replacement, spillway gate rehabilitation, powerhouse control system upgrade, and station service units rehabilitation. Begin headgate system rehabilitation.

*Ice Harbor Dam*

- FY 2019. Completed 115kV disconnect upgrades. Continued station service transformer replacements, drainage system oil water separator installation, Units 1-3 turbine runner replacements and stator winding replacements.

- FY 2020. Complete drainage system oil water separator installation, and station service transformer replacements. Continue units 1-3 turbine runner replacements and stator winding replacements. Begin intake gantry crane controls upgrade.
- FY 2021. Continue units 1-3 turbine runner replacements, stator winding replacements and intake gantry crane controls upgrade. Begin intake gate hydraulic system upgrades and HVAC system upgrade.

*Little Goose Dam*

- FY 2019. Complete station service transformers replacement. Continue drainage and unwatering pump replacement and drainage system oil water separator installation. Begin headgate repair pit upgrade.
- FY 2020. Complete drainage and unwatering pump replacement and drainage system oil water separator installation. Continue headgate repair pit upgrade. Begin DC system and LV switchgear upgrade and powerhouse roof replacement.
- FY 2021. Complete headgate repair pit upgrade and powerhouse roof replacement. Continue DC system and LV switchgear upgrade. Begin intake gate rehabilitation.

*Lower Granite Dam*

- FY 2019. Completed digital governor upgrades and drainage system oil water separator. Continued DC system and LV switchgear upgrade. Began isophase bus and housing upgrade and intake gate rehabilitation.
- FY 2020. Continue DC system and LV switchgear upgrade, isophase bus and housing upgrade, and intake gate rehabilitation.
- FY 2021. Complete isophase bus and housing upgrade. Continue DC system and LV switchgear upgrade. Begin trashrake crane and rake replacement.

*Lower Monumental Dam*

- FY 2019. Completed digital governor replacements, drainage system oil water separator installation and drainage and unwatering pump replacements. Continued DC system and LV switchgear upgrades. Began intake gate rehabilitation.
- FY 2020. Continue DC and LV switchgear upgrades and intake gate rehabilitation. Begin headgate repair pit upgrades and isophase bus upgrades.
- FY 2021. Complete isophase bus upgrades. Continue DC system and LV switchgear upgrades, intake gate rehabilitation and headgate repair pit upgrades.



**Bureau of Reclamation Projects**

(\$K)

FY 2019 Actual	FY 2020 Estimate	FY 2021 Estimate
38,871	114,929	138,037

*Grand Coulee Dam*

- FY 2019. Completed compressed air system upgrades and powerplant battery replacements. Continued Block 31 elevator replacement, Supervisory Control and Data Acquisition (SCADA) replacement, G22-24 wear ring replacements, left and right powerhouse bridge crane replacements, G1-G18 penstock stoplogs, crane control upgrades, roof replacement in the Third Powerplant, and firehouse construction.
- FY 2020. Complete SCADA replacement, Block 31 elevator replacement, Third Powerplant roof replacement, G22-G24 wear ring replacements, firehouse construction and G1-G18 penstock stoplogs. Continue, left and right powerhouse bridge crane replacements, and crane control upgrades. Begin fire alarm system upgrades and units G21-G24 transformer replacements.
- FY 2021. Complete crane control upgrades. Continue left and right powerhouse bridge crane replacements, units G21-G24 transformer replacements, and fire alarm system upgrades. Begin 230kV switchyard modernization.

*Keys Pump Generating Plant*

- FY 2019. Continued P5 and P6 impeller and core replacement and rewinds. Continued P1-P6 exciters, relays and unit controls and PG7-12 governors, exciters, relays and unit controls. Continued phase reversal switch replacement.
- FY 2020. Complete P5 and P6 impeller and core replacement and rewinds. Continue P1-P6 exciters, relays and unit controls, PG7-12 governors, exciters, relays and unit controls and phase reversal switch replacement.
- FY 2021. Continue P1-P6 exciters, relays and unit controls, PG7-12 governors, exciters, relays and unit controls and phase reversal switch replacement.

*Hungry Horse Dam*

- FY 2019. Continued SCADA replacement, control room panel revisions, powerplant crane controls, and main unit transformer fire protection system replacement.
- FY 2020. Complete SCADA replacement and control room panel revisions. Continue powerplant crane controls, and main unit transformer fire protection system replacement. Begin static exciters replacement.
- FY 2021. Continue powerplant crane controls, main unit transformer fire protection system replacement and static exciters replacement.

*Chandler Dam*

- FY 2019. No planned capital projects.
- FY 2020. No planned capital projects.
- FY 2021. No planned capital projects.

*Palisades Dam*

- FY 2019. Completed arc flash mitigation. Continued microwave system backbone modernization.
- FY 2020. Complete microwave system backbone modernization. Begin switchyard modernization.
- FY 2021. Complete switchyard modernization.

*Green Springs Dam*

- FY 2019. Completed transformer replacement. Continued excitation system replacement.
- FY 2020. Complete excitation system replacement.
- FY 2021. No planned capital projects.

*Black Canyon Dam*

- FY 2019. No ongoing capital projects.
- FY 2020. Begin 69kV switchyard installation and station service arc flash mitigation.
- FY 2021. Continue 69kV switchyard installation and station service arc flash mitigation. Begin units 1 and 2 life safety modernization.

*Anderson Ranch Dam*

- FY 2019. No planned capital projects.
- FY 2020. No planned capital projects.
- FY 2021. No planned capital projects.

*Roza Dam*

- FY 2019. Continued switchyard rehabilitation and breaker upgrade.
- FY 2020. Continue switchyard rehabilitation and breaker upgrade.
- FY 2021. Continue switchyard rehabilitation and breaker upgrade.

*Minidoka Dam*

- FY 2019. Completed arc flash mitigation project. Continued microwave system backbone modernization and switchyard modernization.
- FY 2020. Complete microwave system backbone modernization and switchyard modernization.
- FY 2021. No planned capital projects.

**Fish & Wildlife  
(\$K)**

FY 2019 Actual	FY 2020 Estimate	FY 2021 Estimate
22,313	47,266	47,266

**Overview**

Bonneville continues to develop budgets for the suite of fish and wildlife mitigation projects originally adopted in FY 2007 based on recommendations from the Council. Bonneville reaffirmed and expanded many project-specific commitments in subsequent agreements and processes, including BiOps and 2018 Fish Accord extensions, and since then, virtually all these projects received independent science review through the Council and its project review processes. Bonneville’s funding decisions embrace many of the management objectives and priorities in the Program and continue to integrate ESA compliance as described in the NOAA Fisheries’ and USFWS’s FCRPS BiOps. Coordination continues among Bonneville, Council, federal resource management agencies, states, tribes, and others to support the projects that satisfy Bonneville’s mitigation responsibilities.

Bonneville intends to continue implementing the kinds of capital projects listed below. These projects are based upon the best available science and are regionally important in that they provide high priority mitigation and protection actions for fish and wildlife populations affected by the construction and operation of the FCRPS dams. Projects and facilities listed below deliver direct on-the-ground benefits to both ESA listed and non-listed fish and wildlife throughout the Columbia River Basin and have been evaluated and coordinated with the Council, state, federal and tribal fish and wildlife resource managers, local governments, watershed and environmental groups, and other interested parties. Specifically, as capital construction projects, hatchery facilities typically go through the Council’s three-step process, which includes development of a Master Plan, environmental compliance, ESA consultation, value engineering analysis, and review by the Independent Science Review Panel.

The three types of fish and wildlife projects that Bonneville capitalizes are as follows:

- 1) Fish passage structures – Structures funded with capital that enhance fish access to habitat in the Columbia River Basin include but not limited to wells, ladders, screens, pumping, culverts, diversion (irrigation) consolidation, piping to reduce water loss, irrigation efficiencies (drip irrigation), lining of ditches (seepage reduction), removal of objects impeding fish passage or pushup dams, and construction-related habitat restoration.
- 2) Hatchery facility construction – Projects and activities relating to the construction, improvement, and replacement of fish hatcheries, including related satellite facilities (acclimation ponds and collection weirs). This may also include construction-related habitat restoration.
- 3) Land acquisition and stewardship – Land acquisition projects protect, enhance, and maintain fish and wildlife habitat and provide credit to Bonneville, such as acres for wildlife or instream miles for resident fish, to fulfill the legal obligation of Bonneville to mitigate the impacts from construction and operation of the FCRPS.

New construction-related habitat restoration projects that may require capital funds in FY 2021 include the following:

- Svensen Island : The Svensen Island Restoration Project will reconnect the 320 acre island, east of Astoria, Oregon, directly to the mainstream Columbia River to increase ecological function and provide refuge and rearing capacity for out-migrating juvenile salmon and steelhead. Specifically, the project will remove and lower approximately 1.5 miles of existing levee; remove approximately 100 pile dikes on the northern side of the island, to provide unobstructed access to 40 acres of re-connected and newly excavated floodplain and tributary habitats for salmonids and lamprey. The Columbia Restoration Group is leading the project, in partnership with the Columbia Land Trust. This estuary project ranks high on the list of priorities in the estuary and will help to meet the responsibilities of the new NMFS Biological Opinion that will release concurrently with the Columbia River System EIS. Capital construction is scheduled to begin in FY 2021 and will last one year.

-Catherine Creek/Hall Ranch: Project is intended to improve off channel rearing habitat complexity for Chinook, steelhead, and bull trout by restoring dynamic channel geomorphology and habitat forming processes in Catherine Creek and Milk

Creek. It will improve floodplain connectivity through removal and relocation of one mile of State Highway 203 and re-connecting 50 acres of historic Catherine Creek floodplain and channel network. The request is for a project-funding match of \$3,294,616 from Bonneville against additional project investment from other Federal and State partners for a total projected project cost of \$5,994,616. This project has multiple coordination points, requires an environmental impact statement and the environmental compliance process may impact to implementation timeframes where the project is currently expected to start construction in FY 2021.

The Further Consolidated Appropriations Act, 2019 (Public Law 116-94) provided Expenditure Authority for the following project:

- Steigerwald Project: The Steigerwald Floodplain Restoration Project is a collaborative project that will reconfigure the Port of Camas-Washougal's (Port) existing Columbia River levee system to reduce flood risk, reconnect 960 acres of Columbia River floodplain, and increase ecological function at the Steigerwald Lake National Wildlife Refuge. Specifically, the project will construct 1.6 miles of setback levee; completely remove 2.2 miles of existing levee; provide unobstructed access to floodplain and tributary habitats for salmonids and lamprey; and greatly reduce flood risk to the Port's Industrial Park and City of Washougal's wastewater treatment plant, which serves 15,000 residents. Bonneville is working with the lower Columbia Estuary Partnership, which is leading the project. The project will provide seven survival benefit units (~15% of the Action Agencies' total goal in the estuary). Other partners include the Port, USFWS, Washington State Department of Transportation, City of Washougal, and several private landowners. Capital construction is scheduled to begin in FY 2020 and will last three years. This project requires the approval of Bonneville expenditure authority.

The Consolidated Appropriations Act, 2016 (Public Law 114-113) provided Expenditure Authority for the following projects:

- Shoshone Paiute Trout Hatchery: The Shoshone Paiute Tribes of the Duck Valley Reservation, Idaho, have proposed that Bonneville fund the purchase or construction of a trout hatchery. The Tribes would own and operate the hatchery to produce trout to stock the Duck Valley Reservation reservoirs. The hatchery would meet contemporary aquaculture standards and achieve fish production goals. The Tribes believe they can reduce federal reservoir stocking costs, some of which Bonneville currently pays on an annual basis.

- Spokane Tribal Hatchery: Bonneville funded construction of the Spokane Tribal Hatchery in 1989 as partial mitigation for the impacts of the FCRPS. The facility is near Wellpinit, Washington and owned and operated by the Spokane Tribe of Indians. The facility serves as a spawning, rearing, and incubation site for Kokanee salmon and rainbow trout. In June 2015, the Tribe and Bonneville signed a 20-year agreement renewing commitments to operate and maintain the facility. The renewed agreement also plans to upgrade aging infrastructure, including groundwater pumps and rearing containers. Contracting for this work began in FY 2017 and all capital work is complete.

- Snake River Sockeye Weirs: Bonneville funds efforts implemented by the Idaho Department of Fish and Game and the Shoshone Bannock Tribes to repopulate Snake River sockeye throughout the species' historic range. The combination of increased numbers of returning adults and the increased production at the Springfield Sockeye Hatchery, has created the need for the construction, operation, and maintenance of weirs to further sockeye management objectives.

The FY 2014 Omnibus Appropriations Act (Public Law No. 113-76) provided Expenditure Authority for the following projects:

- John Day Reprogramming and Construction: The Columbia River Inter-Tribal Fish Commission (CRITFC) has proposed this project in order to balance the upriver and downriver salmon hatchery production that mitigates for the effects of John Day and The Dalles Dams. The Tribes, the Corps, and Bonneville are still analyzing the final reprogramming facilities and locations. The project area encompasses the mainstream Columbia River from the base of McNary Dam downstream to The Dalles Dam. Capital dollars for this project will integrate with the Corps funds for the construction of new or existing FCRPS hatchery facilities to accommodate the reprogramming of hatchery fish.

- Columbia River Basin White Sturgeon Hatchery: This project, proposed by the CRITFC, will mitigate for the decline of the white sturgeon population caused by consistently poor recruitment upstream of Bonneville Dam. Bonneville would fund

the construction of a new facility, or the acquisition of an existing facility, to produce 15,000 - 30,000 yearling white sturgeons per year. The final project may include the collection, holding and spawning of broodstock, the rearing of wild-spawned juveniles, and the acclimation of juveniles prior to release. The site of the Yakama Nation's existing Marion Drain Sturgeon Hatchery near Toppenish, Washington has been proposed as a location. The project team is working on additional analyses to respond to Council comments and to begin the environmental review process.

- Kelt Reconditioning and Reproductive Success Evaluation Research: CRITFC is proposing a facility to recondition female steelhead (kelts) after they have spawned. The fish will be held and fed until they have re-matured and then be released into the Snake River where they will contribute to the spawning run. The capital portion of the project is expected to be constructed in the Snake River Basin, potentially at the Nez Perce Tribal Hatchery in Idaho. Pursuant to the 2008 FCRPS BiOp and Supplemental FCRPS BiOps issued in 2010 and 2014, Bonneville will implement the kelt reconditioning plan to improve the productivity of Snake River basin B-run steelhead populations that are listed for protection under the ESA. NOAA's analysis of Prospective Actions indicates that a combination of transportation, kelt reconditioning, and in-stream passage improvements (e.g., spill-flow modifications) could increase kelt returns enough to achieve a targeted six-percent increase in the number of returning Snake River B-run steelhead spawners to Lower Granite Dam. The Master Plan for the facility is currently in the second of the Council's amended, shortened, Artificial Production Three-Step Review Process.

Ongoing Projects (Expenditure Authority previously received):

- Crystal Springs Hatchery Facilities: This proposed project is for a rearing and out-planting facility to benefit resident fish in southern Idaho. The facility would be located near the American Falls Reservoir in Idaho where it would produce Yellowstone cutthroat trout, a resident fish. The facility is expected to produce up to 10,000 Yellowstone cutthroat annually for a put and take Tribal fishery. The facility is sponsored by the Shoshone-Bannock Tribes, who are expected to operate and manage the facility once it is complete.

- Redfish Lake Sockeye Salmon program: Snake River sockeye salmon, an Evolutionarily Significant Unit (ESU), is a listed species under the Endangered Species Act. The Snake River Sockeye Salmon Captive Broodstock Program supports the survival of endangered Snake River sockeye salmon. The program has helped to successfully conserve the genetic resources of the founding population, and is producing fish for rebuilding the naturally spawning population in Redfish Lake. The program uses state-of-the-art hatchery facilities, fish husbandry protocols, genetic support, and monitoring and evaluation to continue rebuilding the sockeye population. Currently, the program retains replicate, captive broodstock within multiple facilities, including the Eagle Fish Hatchery in Idaho, and the Burley Creek Fish Hatchery and Manchester Research Station, both in Washington state). Eggs produced from these locations are transferred to other facilities for release programs. The project continues to expand by increasing the capacity of existing facilities and acquiring a new facility under the Idaho Fish sAccord extension. The newly constructed Springfield Fish Hatchery in Idaho produces additional smolts as recommended in the NOAA Fisheries FCRPS BiOp. The expanded smolt releases have already resulted in an increase in the abundance and productivity of the naturally spawning population. This strategy will greatly increase the likelihood of higher adult returns. Additional expansions include improvements at the Redfish Lake Creek trap and Sawtooth Fish Hatchery weir to hold/trap an increased number of adults to support increased smolt production from Springfield Fish Hatchery. The biological goals are to increase the number of adults spawning naturally in the Sawtooth Valley and transition the captive broodstock to a conventional hatchery production program that uses anadromous adults as broodstock.

- Klickitat Production Expansion: In 2008, the Klickitat River Master Plan was submitted by the Yakama Nation, reviewed by the Independent Science Review Panel, recommended with comments by the Council, and conditionally approved by Bonneville. The plan's original goals were to protect and increase naturally producing populations of spring Chinook and steelhead, localize brood collection of harvest stocks (fall chinook and coho), while protecting the biological integrity and the genetic diversity of indigenous fish stocks in the sub-basin. A component of the Master Plan was implemented in 2009, including the completion of upgrades to Lyle Falls Fishway and Castile Falls Fishway, and the construction of a new bridge at the Klickitat Hatchery. In July 2009, a new Klickitat Hatchery Complex EIS was initiated to examine options for the development and operation of new production and supplementation facilities, acclimation alternatives, and additional upgrades to the existing hatchery facility. The Yakama Nation issued a revised Master Plan in July, 2012 that provided updates to their fish management plans. Bonneville suspended the NEPA process while the Yakama Nation refined its

proposal in response to site and budgetary limitations and comments on the draft EIS. Since that time, the National Marine Fisheries Service (NMFS) has completed its Mitchell Act EIS and BiOp, helping inform its funding responsibilities in the sub-basin. Bonneville negotiated a new scope of work with the Yakama Nation, and a revised Master Plan was submitted to the Council in 2017 and approved in 2018. The new scope of work targets design and construction activities for the expansion of the current spring Chinook program only, from 600,000 to 800,000 smolt, and converting to a wild broodstock collection program, as well as general water supply and water abatement upgrades. Bonneville has initiated a new EIS process and construction will occur after Bonneville issues a NEPA ROD and alongside a three-way operations and maintenance agreement which affirms that NMFS will remain responsible for providing funding post-construction.

- Hood River Production Facility: This project has been ongoing since the early 1990s. It currently produces 150,000 spring Chinook salmon smolts and 50,000 winter steelhead smolts annually. The Powerdale Dam Fish Trap formerly provided the foundation for many of the activities associated with implementation of the Hood River Production Program. These include monitoring escapement, collecting life history characteristics, and broodstock acquisition. PacifiCorps' 2010 demolition of its Powerdale Dam and the associated fish trapping facility necessitated the development of alternative adult broodstock trapping sites. One permanent fish trap on the West Fork of the Hood River was completed in 2013, and a temporary trapping site is operational on the East Fork of the Hood River. A permanent trap site on the East Fork is currently being evaluated. The Hood River Production Program has four primary goals: 1) re-establish naturally sustaining runs of spring chinook in the Hood River; 2) re-build naturally sustaining runs of winter steelhead in the Hood River; 3) maintain genetic characteristics of Hood River fish populations; and 4) provide fish for sustainable harvest by both sport and tribal fishers.

- Mid-Columbia Coho Restoration: This Yakama Accord project is intended to re-establish naturally reproducing coho salmon populations in the Wenatchee River and Methow River sub-basins at biologically sustainable levels that also provide significant harvests. This program will construct a facility on the Wenatchee River for holding and spawning broodstock, incubating eggs, and rearing juveniles. Additional semi-natural ponds will also be constructed in the Wenatchee and Methow sub-basins for acclimating smolts prior to their release. The phased approach, including associated facilities, incorporates development of a mid-Columbia hatchery broodstock, local adaptation to tributaries in the Wenatchee and Methow Basins, and habitat restoration that will benefit coho as well as ESA-listed spring chinook, steelhead, and bull trout. Major facility construction is expected to continue through FY 2020.

- Walla Walla Hatchery: The Confederated Tribes of the Umatilla Indian Reservation (CTUIR) proposed the construction of the Walla Walla Hatchery. The Tribes will own and operate the hatchery, which will produce up to 500,000 spring Chinook smolts annually for release into the Walla Walla River. A 30 percent design was completed in June 2015, and a draft EIS was completed in September 2016. However, due to budget overruns, the project was reconfigured. Design and construction was successfully rebid, and construction has been on hold awaiting issuance of a NPDES permit by the state water authority. Construction started in fall 2019. The facility will hold, spawn, incubate, and rear spring Chinook on the South Fork Walla Walla River near Milton-Freewater, Oregon.

- Yakima Melvin R. Sampson Coho Facility: This hatchery was proposed by the Confederated Tribes and Bands of the Yakama Nation, and is presented in the Yakima River Subbasin Summer and Fall Run Chinook and Coho Salmon Hatchery Master Plan. The Yakama Nation will own and operate the hatchery which will produce up to 700,000 coho smolts using broodstock collected at Roza and Sunnyside dams. Bonneville holds the design and construction contract on behalf of the Yakama Nation. Bonneville published a final EIS on November 6, 2017, and a Record of Decision April 9, 2018, with construction beginning August 2018. The facility is still under construction and is expected to be completed in FY20.

Potential non-construction capital Wildlife and Resident Fish Habitat Acquisitions (including Conservation Easements) eligible for capitalization are:

- Albeni Falls Wildlife Mitigation
- Willamette Wildlife Habitat Acquisitions
- Libby and Hungry Horse Reservoirs Resident Fish Acquisitions
- Southern Idaho Habitat Acquisitions

**Activities and Explanation of Changes (\$K)**

FY 2020 Estimate	FY 2021 Estimate	Explanation of Changes FY 2021 vs FY 2020 Estimate
<b>Power Services – Capital \$285,266</b>	<b>\$303,266</b>	<b>\$18,000/6.3%</b>
<b>Associated Projects \$238,000</b>	<b>\$256,000</b>	<b>\$18,000/7.6%</b>
Milestones <sup>1</sup> :	Milestones:	<ul style="list-style-type: none"> <li>The increase reflects a reshaping of funding needs for investment in the hydroelectric system assets.</li> </ul>
<ul style="list-style-type: none"> <li>Complete GSU transformer instrumentation at Bonneville Dam.</li> <li>Complete emergency gantry crane replacement at John Day Dam.</li> <li>Complete GDACS installation across the Willamette Valley, Detroit spillway gate rehabilitation, and Big Cliff intake gantry crane replacement at Willamette Plants.</li> <li>Complete intake gantry crane replacement at Libby Dam.</li> <li>Complete upgrades for station service units and powerhouse HVAC upgrade at Chief Joseph Dam.</li> <li>Complete tailrace crane rehabilitation at Dworshak Dam.</li> <li>Complete station service transformer replacements at Ice Harbor Dam.</li> <li>Complete DC system and LV switchgear upgrade at Lower Granite Dam.</li> <li>Complete SCADA replacement, Third Powerplant roof replacement and G1-G18 penstock stoplogs at Grand Coulee Dam.</li> <li>Complete P5 and P6 impeller and core replacement and rewinds, and phase reversal switch replacement at Keys Pump Generating Plant.</li> </ul>	<ul style="list-style-type: none"> <li>Complete control room fire protection upgrades and oil water separator improvements at Bonneville Dam.</li> <li>Complete trash rack crane replacement at John Day Dam.</li> <li>Complete transformer replacements at The Dalles Dam.</li> <li>Complete security system upgrades at Libby Dam.</li> <li>Complete intake gantry crane rehabilitation Chief Joseph Dam.</li> <li>Complete intake gantry crane replacement at McNarry Dam.</li> <li>Complete headgate repair pit upgrade and powerhouse roof replacement at Little Goose Dam.</li> <li>Complete isophase bus and housing upgrade at Lower Granite Dam.</li> <li>Complete isophase bus upgrades at Lower Monumental Dam.</li> <li>Complete crane control upgrades at Grand Coulee Dam.</li> <li>Complete switchyard modernization at Palisades Dam.</li> </ul>	

<sup>1</sup> FY 2020 milestones have been updated from the FY 2020 Congressional submission due to updated forecasts.

FY 2020 Estimate	FY 2021 Estimate	Explanation of Changes FY 2021 vs FY 2020 Estimate
<b>Fish &amp; Wildlife \$47,266</b> Milestones: <ul style="list-style-type: none"> <li>Continue implementation of the Program, BiOps and 2018 Fish Accord extension.</li> </ul>	<b>\$47,266</b> Milestones: <ul style="list-style-type: none"> <li>Continue implementation of the Program, BiOps and 2018 Fish Accord extension.</li> </ul>	<b>\$0/0.0%</b> <ul style="list-style-type: none"> <li>Fish &amp; Wildlife will continue long-term, planned effort to reshape funding necessary to implement the BiOps, 2018 Fish Accord extension, Columbia River Basin Fish and Wildlife activities.</li> </ul>



**Transmission Services – Capital  
Funding Schedule by Activity  
Funding (\$K)**

	FY 2019 Actual	FY 2020 Estimate	FY 2021 Estimate	FY 2021 vs FY 2020	
				\$	%
<b>Transmission Services – Capital</b>					
Main Grid	3,575	2,714	27,087	\$24,373	898.0%
Area & Customer Services	38,395	80,453	90,935	10,481	13.0%
Upgrades & Additions	29,173	55,683	49,464	-6,219	-11.2%
System Replacements	120,933	329,914	306,819	-23,095	-7.0%
Projects Funded in Advance	239,228	85,896	66,179	-19,717	-23.0%
<b>Total, Transmission Services - Capital</b>	<b>431,305</b>	<b>554,661</b>	<b>540,484</b>	<b>-14,177</b>	<b>-2.6%</b>

**Outyears (\$K)**

	FY 2021 Estimate	FY 2022 Estimate	FY 2023 Estimate	FY 2024 Estimate	FY 2025 Estimate
<b>Transmission Services - Capital</b>					
Main Grid	27,087	25,054	33,487	45,520	39,405
Area & Customer Services	90,935	74,145	69,070	55,922	66,319
Upgrades & Additions	49,464	68,536	103,993	120,543	75,036
System Replacements	306,819	300,217	300,528	303,454	311,204
Projects Funded in Advance	66,179	60,463	39,848	39,823	40,947
<b>Total, Transmission Services - Capital</b>	<b>540,484</b>	<b>528,415</b>	<b>546,925</b>	<b>565,262</b>	<b>532,911</b>

## Transmission Services – Capital

### Overview

Transmission Services (TS) is responsible for about 75 percent of the Pacific Northwest’s high-voltage transmission. TS provides funding for all additions and upgrades (Expansion Investments), and replacements (Sustain Investments) to the Bonneville transmission system, resulting in reliable service to Northwest generators and transmission customers. The Bonneville transmission system also facilitates the delivery of power under sales and exchange agreements to and from the Pacific Northwest Region. The TS Capital Program is structured with a balanced focus on Expansion and Sustain investments.

In addition to replacing aging and obsolete equipment, TS continues to make significant infrastructure improvements and additions to the system to assure reliable transmission in the Northwest. These improvements and additions will help the Bonneville transmission system continue to comply with national reliability standards and remove constraints that limit economic trade or the ability to maintain the system. Some of the proposed TS projects may be funded through Bonneville lease-purchase agreements. The lease-purchases obligate Bonneville to make expenditures to acquire the use of the related facilities and are identified on an as needed basis. Bonneville may also make related expenditures to facilitate lease-purchase opportunities. Consistent with the FY 2018, FY 2019, and FY 2020 Budget Requests, the FY 2021 Budget Request maintains the proposal that the Federal government be authorized to sell the transmission assets of Bonneville.

### Expansion Investments

Expansion investments continue to make significant infrastructure improvements and additions to the Bonneville transmission system to assure reliable transmission operations in the Northwest and fall into two categories:

- Internally driven Expansion requests, which are derived from system engineering studies, technology innovation research, system operations and maintenance functions, and system event analysis.
- Externally driven Expansion Investment requests, which are derived from governmental initiatives and regulations, consumer demand, and the integration of customer load service and generation needs.

These investments are categorized into:

1. Main Grid – System investments affecting the major interties or internal paths and flowgates that transfer bulk power across the system.
2. Area & Customer Service – System investments related to geographical load service areas.
3. Upgrades & Additions – Upgrades are system investments that replace existing assets to increase capacity, reliability, or functionality and Additions are net new assets added to the system.
4. Projects Funded in Advance – System investments that are requested, and funded in advance, by customers.

Congressionally-approved Production Tax Credits (PTC) for renewable energy enacted in 2005 was extended through 2021. The PTC begins to phase out after 2021. The incentives created by these credits, along with Renewable Portfolio Standards (RPS) mandates implemented by the states of Oregon, Washington, and California, have spurred a large number of renewable projects interconnection requests to the Bonneville transmission system grid. As of July 2019, Bonneville has interconnected a total of 5,285 MW of renewable qualified generation projects. Bonneville has more than 10,000 MW in additional renewable (wind, solar, biomass, geothermal, etc.) interconnection requests still remaining in the study queue. Solar project interconnection requests are currently making up the majority of the new requests in Bonneville’s queue. The current projections are possibly 9,000 MW of renewable generation projects interconnected by 2025. Much of the remaining generation project transmission demand is the result of the Renewable Portfolio Standards and other legislations enacted by Oregon and Washington that require retail utilities to acquire more than 8,000 MW of renewable energy in the Northwest by 2025. Exports of power from the Northwest to California are limited by California laws and are expected to remain at 2,000 MW to 2,500 MW during the same period. Also in the BPA transmission interconnection request queue is approximately 1,500 MW of natural gas fired generation. Efficiency improvements to the FCRPS hydro units that qualify as renewable are also proposed between 2018 and 2024.

In June 2008, Bonneville’s first Network Open Season (NOS) received 153 requests from 28 customers for 6,410 MW of new service, about three-fourths for wind energy integration. Bonneville subsequently offered 1,782 MW of new transmission service on its existing system. Bonneville identified four new Main Grid capital projects from the 2008 NOS: (1) McNary-John Day 500 kV transmission line (part of West of McNary Reinforcements Group 1); (2) Big Eddy-Knight 500 kV transmission line and substation (part of West of McNary Reinforcements Group 2); (3) Central Ferry- Lower Monumental

500 kV Reinforcement (formerly Little Goose Area Reinforcement); and (4) I-5 Corridor 500 kV Reinforcement. Construction of the McNary-John Day 500 kV transmission line is complete and Bonneville has completed construction of the Big Eddy-Knight project and the Central Ferry-Lower Monumental 500 kV Reinforcement project. On May 18, 2017, Bonneville announced its decision to not build the I-5 Corridor Reinforcement Project. Bonneville continues to work with constituents and stakeholders to study more cost effective options to mitigate the current limitations along this path. Public meetings began in July 2017 to address alternatives to building. An update to Bonneville's Available Transfer Capability (ATC) methodology increased the available transmission service on the Westside paths by a few hundred MW. Other alternatives, such as energy storage devices, are still being evaluated. Bonneville released its 2019 Cluster Study results in June of 2019 and 1475 MW of new transmission service have been offered and are being reviewed by customers.

Bonneville's 2009, 2010, 2013, 2016, and 2019 study processes for new Transmission Service Requests (TSR) total 14,992 MW, including 5,840 MW of wind project interconnection and 1,555 MW of solar project interconnection. The 2010 study process identified the Montana to Washington project, for which environmental review was begun, however, the requests to support this project have been subsequently withdrawn and so all work on the project was terminated. The 2016 and 2019 study processes re-identified the Montana to Washington and Garrison to Ashe projects to move new wind generation in Montana to the Northwest. The 2013 study process identified upgrades to the Monroe-Novelly Hill 230-kV transmission line which were re-identified for additional new requests in the 2016 study process. The 2016 study process identified network upgrades in Central Oregon, Walla Walla, Washington and across the Raver-Paul flowgate. The 2019 study process identified additional reinforcements across the Raver-Paul flowgate, the same Central Oregon and Walla Walla projects, and some significant impacts to third parties, specifically PGE and PSE. Efforts are currently underway to evaluate the financial impacts and move forward with required agreements and processes within the TSR Study and Expansion Process (TSEP).

#### Sustain Investments

Sustain investments are made to maintain the health of the existing infrastructure to assure reliable transmission in the Pacific Northwest. These replacements enable continued compliance with national reliability standards, replace aging and obsolete equipment, and remove constraints that limit economic trade or the ability to maintain the transmission system.

In 2009, TS began implementing best practice frameworks that provide a standardized structure and approach to Asset Management. As a result, TS's Asset Management Strategies, derived from the Agency's Strategic Plan, drive Bonneville's Asset Plans, which determine its capital and expense investment priorities. Sustain investments are forecasted, prioritized within asset programs, and optimized across the asset base for asset planning and approval. BPA now bundles both sustain and expand capital projects in an effort to improve execution and to lower risks and costs. TS's capital program does remain somewhat fluid and subject to changes as the complexity of the transmission system produces unexpected needs resulting from equipment failure, climate/weather incidents, changes in performance and/or operation of connected systems, outage schedules and conflicts, updated regulations, customer interconnection requests, etc. For these and other reasons, specificity with Sustain investments in the transmission system is somewhat limited.

The TS Sustain Program Asset Programs include:

1. Steel Lines – Transmission lines with steel structures including footings, insulators assemblies, vibration dampers, grounding systems, conductor, ground wire.
2. Wood Lines – Transmission lines with wood structures including cross arm systems, insulator assemblies, vibration dampers, grounding systems, conductor, ground wire.
3. Rights-of-Way – Real property including land parcels, easements, use right, access roads.
4. AC Substations – Substations managing AC current including transformers, reactors, shunt capacitors, power circuit breakers, circuit switchers, series capacitors, disconnect switches.
5. Power System Controls and System Telecommunications – Control and communication equipment including SCADA, transfer trips, fiber, communications, SONET, Telephone, RAS.
6. System Protection and Control – Control equipment including relays, Control Houses, meters.
7. DC Substations – Celilo DC converter station, Static VAR Compensators, DC control systems.
8. Control Centers – Various control equipment and software.
9. Tools and Equipment Acquisition Program (TEAP) –Tools, equipment, fleet.
10. Facilities – Non-electric facilities including warehouses, operational structures, hangar, and maintenance centers.

Notwithstanding that the capital program for TS is subject to change, Bonneville has identified several general areas where capital investments will occur.

Bonneville will continue to fund fiber optic communications facilities needed to meet Bonneville's projected operational needs. To the extent that these investments create temporary periods of excess fiber optic capacity, such dark fiber capacity can be made available to telecommunications providers and to non-profits to meet public benefit internet access needs for rural areas and other needs in Bonneville's service area. Bonneville's investments in fiber optics, including the role of the private sector in building fiber optic networks, is consistent with the "Fiber Optic Cable Plan" submitted to Congress on May 24, 2000, accompanying the FY 2000 Energy and Water Development Appropriations Act. In accordance with this plan, when possible, Bonneville will establish partnerships with fiber optic facility and service providers to meet its needs.

In December 2004, Congress passed and the President signed the Commercial Spectrum Enhancement Act (CSEA, Title II of P.L. 108-494), creating the Spectrum Relocation Fund (SRF) to streamline the relocation of federal systems from certain spectrum bands to accommodate commercial use by facilitating reimbursement to affected agencies of relocation costs. The Federal Communications Commission has auctioned licenses for reallocated federal spectrum, which will facilitate the provision of Advanced Wireless Services to consumers. Funds were made available to agencies in FY 2007 for relocation of communications systems operating on the affected spectrum. These funds are mandatory and will remain available until expended, and agencies will return to the SRF any amounts received in excess of actual relocation costs. The estimated Bonneville cost of this relocation was \$48.7 million. The project was completed in November 2013 with a cost of approximately \$40 million and the operational system performance was being observed during FY 2014 and early FY 2015 to determine that it has achieved comparable capability as defined under the CSEA. Bonneville determined in December 2014 that comparable capability had been achieved.

Bonneville began participating in a new spectrum relocation effort in FY 2015. The NTIA has approved and, in July 2014, web-posted federal agency relocation plans, including the Bonneville relocation plan. The FCC held an auction of this spectrum on November 13, 2014. Bonneville received an additional \$5.2 million from the Spectrum Relocation Fund on July 29, 2015, to fully pay for this new relocation effort, including, as in the prior relocation, the purchase and installation of new digital radio equipment.

As part of the Homeland Security Presidential Directives, Bonneville has completed a physical security assessment of all critical facilities and is implementing security enhancements at these facilities. These security enhancements increase controlled access to Bonneville's facilities and provide video surveillance and monitoring capabilities.

### **Accomplishments**

- The BP-20 - Rate Case final record of decision was released July 25, 2019. FERC granted interim approval to proposed rates on September 30, 2019.
- Integrated 5,285 MW of renewable energy through July 2019 on Bonneville's transmission system.
- Completed construction of the Bakeoven and Slatt Substations Series Capacitor Upgrade Projects.

### **Explanation of Changes**

Bonneville's budget includes \$540.5 million in FY 2021 for TS Capital which is a 2.6 percent decrease from the FY 2020 forecasted level. The FY 2021 budget increases the levels for Main Grid (+\$24.4 million) and Area & Customer Services (+\$10.5 million). The budget decreases levels for Upgrade & Addition (-\$6.2 million), System Replacements (-\$23.1 million), and PFIA (-\$19.8 million).

### **Strategic Asset Management**

Transmission Services provides transmission and energy services while integrating renewable resources across the Pacific Northwest. This effort is coordinated throughout Bonneville in conjunction with the newly developed Strategic Asset Management Plan (SAMP). TS continues to implement integrated detailed Asset Plans to serve the region:

1. To improve system adequacy, reliability, and availability, Bonneville has embarked on major transmission infrastructure projects. The identified projects reinforce the transmission system and help meet the region's future power needs. These projects address multiple challenges, such as integration of renewable energy, the need to relieve a number of

congested transmission paths, the challenge to keep up with growing energy demands, and the need to meet changing regulatory and customer requirements.

2. Open access policy in support of competitive markets for load and generation.
3. The replacement of aging assets is vital to the reliability of the existing transmission system. To that end, TS has developed specific long-term strategies for the following asset categories:
  - a. Substations AC
  - b. Power System Control/System Telecommunications
  - c. Wood Lines
  - d. Steel Lines
  - e. Rights of Way (ROW), (Land Rights, Access Roads, and Vegetation Management)
  - f. System Protection and Control
  - g. Control Centers
  - h. Non-Electric Facilities

The following external factors present the strongest impact to overall achievement of the program's strategic goal:

- Continually changing economic and institutional conditions
- Competitive dynamics
- Ongoing changes in the electric industry
- Siting issues

<b>Main Grid (\$K)</b>		
<b>FY 2019 Actual</b>	<b>FY 2020 Estimate</b>	<b>FY 2021 Estimate</b>
3,575	2,714	27,087

**Overview**

Bonneville’s strategic objectives for Main Grid projects are to assure compliance with the NERC and Western Electricity Coordinating Council (WECC) reliability criteria, provide voltage support, provide a reliable transmission system for open access, and provide for relief of transmission system congestion. During this budgeting period, projects are planned that will provide transmission reinforcement and voltage support to major load areas that are primarily west of the Cascade Mountains.

Continued investments in Main Grid assets include:

*Monroe Line Re-termination*

- FY 2019. Continue construction.
- FY 2020. Complete construction.
- FY 2021. No planned capital projects.

*Schultz-Wautoma 500KV Series Capacitors*

- FY 2019. Begin construction.
- FY 2020. Continue construction.
- FY 2021. Continue construction.

*Continue Planning Studies to: (all years)*

- Identify infrastructure additions.
- Identify projects driven by NERC and WECC reliability criteria.
- Identify system reactive needs to mitigate unacceptable low or high voltage problems and other system additions.
- Relieve transmission system congestion and integrate new generation facilities.

**Area & Customer Service**

(\$K)

FY 2019 Actual	FY 2020 Estimate	FY 2021 Estimate
38,395	80,453	90,935

**Overview**

Bonneville’s strategic objective for Area and Customer Service projects is to assure that Bonneville meets reliability standards and contractual obligations to its load service areas.

Continued investments in Area & Customer Service assets include:

*Hooper Springs Substation*

- This project will now be constructed and owned by Lower Valley Energy and completed in FY 2020.

*Midway-Grandview 115 kV Line upgrade*

- FY 2019. Completed construction.
- FY 2020. No planned capital projects.
- FY 2021. No planned capital projects.

*Puget Sound Area Northern Intertie (PSANI)*

- FY 2019. Continue construction.
- FY 2020. Complete construction.
- FY 2021. No planned capital projects.

*McNary Substation 500/230 kV Bank Addition*

- FY 2019. Completed construction.
- FY 2020. No planned capital projects.
- FY 2021. No planned capital projects.

*Paul Substation 500 kV Shunt Reactor Addition*

- FY 2019. Completed construction.
- FY 2020. No planned capital projects.
- FY 2021. No planned capital projects.

*Big Eddy Breaker Additions*

- FY 2019. No planned capital projects.
- FY 2020. Begin design.
- FY 2021. Begin construction.

*Drummond 115kV Breaker Additions*

- FY 2019. Completed construction.
- FY 2020. No planned capital projects.
- FY 2021. No planned capital projects.

*Midway –Ashe Double Circuit 230kV Line*

- FY 2019. No planned capital projects.
- FY 2020. Begin design.
- FY 2021. Begin construction

*Carlton Substation Upgrade*

- FY 2019. No planned capital projects.

- FY 2020. Begin design.
- FY 2021. Begin construction.

*Conkelley Substation Retirement*

- FY 2019. No planned capital projects.
- FY 2020. Complete design.
- FY 2021. Begin construction.

*Continuous Activities (all years)*

Continue preliminary engineering and design for miscellaneous facilities required to meet contractual obligations and maintain reliable service for Bonneville's service area.



**Upgrades & Additions  
(\$K)**

<b>FY 2019 Actual</b>	<b>FY 2020 Estimate</b>	<b>FY 2021 Estimate</b>
29,173	55,683	49,464

**Overview**

Bonneville’s strategic objectives for Upgrades and Additions are to replace older 60 Hz (Hertz) communications and controls with newer technology including fiber optics in order to maintain or enhance the capabilities of the transmission system; to implement special remedial action control schemes to accommodate new generation and mitigate immediate operational and market constrained paths; and to support communications and remedial action schemes, among other proposals.

During this budget period, Bonneville will complete design, material acquisition, construction, and activation of several fiber optics facilities to provide bandwidth capacity and high-speed data transfers to eventually replace microwave analog radios, which are technologically obsolete and nearing the end of their useful life. Temporarily, in some areas, excess dark fiber capacity is being offered for a term to telecommunications providers or to public entities such as public utilities, schools, libraries, and hospitals, providing them access to high-speed telecommunication services as a public benefit.

Continued investments in Upgrades & Additions assets include:

*VHF Radio System Upgrade*

- FY 2019. Continue construction.
- FY 2020. Continue construction.
- FY 2021. No planned capital projects.

*VCC (Vancouver Control Center)*

- FY 2019. No planned capital projects.
- FY 2020. Begin Scoping and design as well as some demolition.
- FY 2021. Complete design and begin construction.

*Bell-Boundary #DC SONET Ring Upgrade*

- FY 2019. Complete construction.
- FY 2020. No planned capital projects.
- FY 2021. No planned capital projects.

*Operational Megabit Ethernet (OMET) System*

- FY 2019. Continue construction.
- FY 2020. Continue construction.
- FY 2021. Continue construction.

*500 kV Spares at Wind Integration Substations*

- FY 2019. Continue construction.
- FY 2020. Complete construction.
- FY 2021. No planned capital projects.

*Continuous Activities (all years)*

- Upgrading two miles of fiber between Bonneville Power House and Bonneville Control House.
- Planning, design, material acquisition, and construction of special remedial action control schemes required for interconnecting new generation projects and mitigating immediate constrained paths.
- Planning, design, material acquisition, and construction of various system additions and upgrades necessary to maintain a reliable system for Bonneville’s service area.
- Construction of secondary fiber related projects and digital radio system upgrades to improve the operational telecommunication system.

- Material procurement and construction to upgrade the main fiber optic backbone system (#KC and #NC systems).

**System Replacements  
(\$K)**

<b>FY 2019 Actual</b>	<b>FY 2020 Estimate</b>	<b>FY 2021 Estimate</b>
120,933	329,914	306,819

**Overview**

Bonneville’s strategic objectives for the Sustain Program are to replace high-risk, obsolete, and maintenance-intensive facilities and equipment and to reduce the chance of equipment failure by: (1) replacing high voltage transformers and power circuit breakers which are at or near the end of their useful life; (2) replacing risky, outdated and obsolete control and communications equipment and systems, including mandated replacements due to legislation; and (3) replacing all other existing high-risk equipment and facilities affecting the safety and reliability of the transmission system. Transmission Services uses a total economic cost model to determine priorities for replacement.

Continued investments in System Replacements assets include:

*Continuous Activity (all years)*

*Non-Electric Replacements*

- Continue non-electric replacements as necessary.
- Continue the design, material acquisition, and construction for the Access Road program capital component and the Land Rights program capital component in support of the Lines and ROW Programs.
- Continue design and construction of capital improvements for identified existing facilities.
- Continue replacement of tools, equipment, and vehicle fleet.
- Replace BPA fixed-wing aircraft with a helicopter in FY 2020 utilizing General Services Administration exchange sale authority.

*Electric Replacements*

- Continue replacement of system protection and control equipment and other substation and line facilities as needed to maintain reliability using Reliability Centered Maintenance criteria. Such replacements include relays, annunciators, oscillographs, metering, and various types of communication related equipment replacing and migrating analog to digital technology and SCADA equipment.
- Begin design and replacement of the Keeler and Maple Valley SVC units. Completion scheduled for FY2020.
- Continue replacement of under-rated and high maintenance substation equipment.
- Continue replacing insulators and refurbishing foundations on 500 kV Lines.
- Continue replacement of older generations of digital equipment that is obsolete.
- Continue replacing critical, operational tools and business systems at the Dittmer and Munro Control Centers.
- Continue replacing deteriorating wood pole transmission line structures, spacer dampers, and insulators.

**Projects Funded in Advance  
(\$K)**

<b>FY 2019 Actual</b>	<b>FY 2020 Estimate</b>	<b>FY 2021 Estimate</b>
239,228	85,896	66,179

**Overview**

This category includes those facilities and/or equipment where Bonneville retains control or ownership but which are funded or financed by a third party or with reserves, either in total or in part.

Continued investments in PFIA assets include:

*Umatilla Electrical Cooperative - Phase 2*

- FY 2019. Continue construction.
- FY 2020. Complete construction.
- FY 2021. No planned capital projects.

*Summit Ridge Wind Project*

- FY 2019 Project cancelled.
- FY 2020. No planned capital projects.
- FY 2021. No planned capital projects.

*Bakeoven Wind Project*

- FY 2019. No planned capital projects.
- FY 2020. Begin design
- FY 2021. Begin construction.

*Quenett Creek Load Service Project*

- FY 2019. Continue construction.
- FY 2020. Continue construction.
- FY 2021. Complete construction.

*PacifiCorps' Ponderosa Project Vitesse*

- FY 2019. Complete construction.
- FY 2020. No planned capital projects.
- FY 2021. No planned capital projects.

*Midway-Ashe Line Project*

- FY 2019. No planned capital projects.
- FY 2020. Begin design.
- FY 2021. Begin construction.

*Avangrid Montague 1 Wind Project*

- FY 2019. Continue construction.
- FY 2020. Complete construction.
- FY 2021. No planned capital projects.

*Invenergy's Heppner Wind Project*

- FY 2019. No planned capital projects.
- FY 2020. No planned capital projects.
- FY 2021. Begin design.

*Morrow Solar Project*

- FY 2019. No planned capital projects.
- FY 2020. No planned capital projects.
- FY 2021. Begin design

*2 Morrow Energy LLC's Ella 3 Wind Project*

- FY 2019. Begin design.
- FY 2020. Begin construction.
- FY 2021. Continue construction.

*Whistling Ridge 230 kV Ring Bus Project*

- FY 2019. No planned capital projects.
- FY 2020. No planned capital projects.
- FY 2021. Begin design.

*Continuous Activity (all years)*

- Continue to integrate various new generation and line/load projects into Bonneville transmission grid based on requests placed and processed in accordance with transmission tariff.
- Continue planning studies to identify system impacts and needs regarding proposed new generation projects.
- Engineer and begin construction of several large wind generation interconnection substations.

**Activities, Milestones, and Explanation of Changes (\$K)**

FY 2020 Estimate	FY 2021 Estimate	Explanation of Changes FY 2021 vs FY 2020 Estimate
<b>Transmission Services – Capital \$554,661</b>	<b>\$540,484</b>	<b>\$-14,177/-2.6%</b>
<b>Main Grid \$2,714</b>	<b>\$27,087</b>	<b>\$24,373/898.0%</b>
Milestones: <ul style="list-style-type: none"> <li>• Complete construction of Monroe 500 kV Line Re-termination #2.</li> <li>• Begin construction of Schultz-Wautoma 500Kv Series Capacitors.</li> </ul>	Milestones: <ul style="list-style-type: none"> <li>• Continue construction of Schultz-Wautoma 500KV Series Capacitors.</li> </ul>	<ul style="list-style-type: none"> <li>• The increase is due to increased construction planned for FY 2021.</li> </ul>
<b>Area &amp; Customer Service \$80,453</b>	<b>\$90,935</b>	<b>\$10,481/13.0%</b>
Milestones: <ul style="list-style-type: none"> <li>• Begin construction of Carlton Substation Upgrade.</li> <li>• Begin construction of Midway- Ashe Double Circuit 230kV line.</li> <li>• Complete construction of the PSANI project.</li> <li>• Begin construction of Conkelley Upgrade.</li> </ul>	Milestones: <ul style="list-style-type: none"> <li>• Begin construction of Big Eddy Breaker Additions.</li> <li>• Continue construction of Midway-Ashe Double Circuit 230kV.</li> <li>• Continue construction of Carlton Substation Upgrade.</li> <li>• Begin construction of Conkelley Substation Retirement.</li> </ul>	<ul style="list-style-type: none"> <li>• The increase reflects increased construction planned for FY 2021.</li> </ul>

FY 2020 Estimate	FY 2021 Estimate	Explanation of Changes FY 2021 vs FY 2020 Estimate
<p><b>Upgrades &amp; Additions \$55,683</b></p> <p>Milestones:</p> <ul style="list-style-type: none"> <li>Continue construction of VHF Radio System Upgrade.</li> </ul>	<p><b>\$49,464</b></p> <p>Milestones:</p> <ul style="list-style-type: none"> <li>Continue construction of Operational Megabit Ethernet (OMET) System.</li> </ul>	<p><b>\$-6,219/-11.2%</b></p> <ul style="list-style-type: none"> <li>The decrease reflects decreased planned capital projects for FY 2021.</li> </ul>
<p><b>Systems Replacements \$329,914</b></p> <p>Milestones:</p> <ul style="list-style-type: none"> <li>Continue design and construction of capital improvements for identified existing facilities.</li> <li>Continue non-electric replacements as necessary.</li> <li>Continue replacement of system protection and control equipment and other substation and line facilities as needed to maintain reliability using Reliability Centered Maintenance criteria.</li> <li>Complete construction of Keeler-Maple Valley Upgrade.</li> </ul>	<p><b>\$306,819</b></p> <p>Milestones:</p> <ul style="list-style-type: none"> <li>Continue design and construction of capital improvements for identified existing facilities.</li> <li>Continue non-electric replacements as necessary.</li> <li>Continue replacement of system protection and control equipment and other substation and line facilities as needed to maintain reliability using Reliability Centered Maintenance criteria.</li> </ul>	<p><b>\$-23,095/-7.0%</b></p> <ul style="list-style-type: none"> <li>The decrease reflects decreased planned capital projects for FY 2021.</li> </ul>

FY 2020 Estimate	FY 2021 Estimate	Explanation of Changes FY 2021 vs FY 2020 Estimate
<p><b>Projects Funded in Advanced \$85,896</b></p> <p>Milestone:</p> <ul style="list-style-type: none"> <li>• Continue to integrate new generation as requested.</li> <li>• Continue planning studies on needs and impacts of proposed new generation.</li> <li>• Complete construction of Bakeoven Series Capacitors.</li> <li>• Continue construction of PacifiCorps' Project Vitesse.</li> <li>• Complete construction of Avangrid Montague 1 project.</li> <li>• Begin construction of 2 Morrow Energy LLC's Ella 3 Wind Project.</li> <li>• Complete construction of Morrow Solar Project.</li> </ul>	<p><b>\$66,179</b></p> <p>Milestones:</p> <ul style="list-style-type: none"> <li>• Continue to integrate new generation as requested.</li> <li>• Continue planning studies on needs and impacts of proposed new generation.</li> <li>• Begin construction of Bakeoven Wind Project.</li> <li>• Complete construction of Quenett Creek Load Service Project.</li> <li>• Begin construction of Midway-Ashe Line Project.</li> <li>• Begin design of Invenergy's Heppner Wind Project.</li> <li>• Begin design of Morrow Solar Project.</li> <li>• Continue construction of 2 Morrow Energy LLC's Ella 3 Wind Project.</li> <li>• Begin design of Whistling Ridge 230kV Ring Bus Project.</li> </ul>	<p><b>\$-19,717/-23.0%</b></p> <ul style="list-style-type: none"> <li>• The decrease reflects decreased planned PFIA capital projects for FY 2021.</li> </ul>



**Capital Information Technology & Equipment/Capitalized Bond Premium  
Funding Schedule by Activity  
Funding (\$K)**

	FY 2019 Actual	FY 2020 Estimate	FY 2021 Estimate	FY 2021 vs FY 2020	
				\$	%
<b>Capital Information Technology (IT) &amp; Equipment/Capitalized Bond Premium</b>					
Capital IT & Equipment	10,029	22,100	22,131	32	0.1%
Capitalized Bond Premium	0	0	0	0	0.0%
<b>Total, Capital IT &amp; Equipment/Capitalized Bond Premium</b>	<b>10,029</b>	<b>22,100</b>	<b>22,131</b>	<b>32</b>	<b>0.1%</b>

**Outyears (\$K)**

	FY 2021 Estimate	FY 2022 Estimate	FY 2023 Estimate	FY 2024 Estimate	FY 2025 Estimate
<b>Capital Information Technology (IT) &amp; Equipment/Capitalized Bond Premium</b>					
Capital IT & Equipment	22,131	22,296	22,268	21,146	20,271
Capitalized Bond Premium	0	0	0	0	0
<b>Total, Capital IT &amp; Equipment/Capitalized Bond Premium</b>	<b>22,131</b>	<b>22,296</b>	<b>22,268</b>	<b>21,146</b>	<b>20,271</b>

## **Capital Information Technology & Equipment/Capitalized Bond Premium**

### **Overview**

Capital Information Technology (IT) provides for the acquisition of general and some dedicated special purpose capital information technologies, and acquisition of special-use capital and IT equipment in support of Bonneville's strategic objectives. This category also includes Bonneville's on-going efforts to facilitate delivery of a highly resilient organization able to anticipate, withstand, and effectively respond to disruptive events affecting it and its partners in the Northwest region. The four main areas of resiliency focus continue to include asset management, emergency management, crisis management, and continuity of operations.

Bonneville continues to move its IT infrastructure to a more efficient architecture. This FY 2021 Budget supports this effort. IT continues to eliminate redundancies in tools and applications, establish an agency-wide IT architecture with standardized IT purchasing criteria, standardize software licensing processes and minimize agency liabilities through stronger contracts, apply continuous improvement practices to IT project management, and implement an agency IT portfolio cost management strategy. The IT estimates in this FY 2021 Budget under Capital IT and Equipment include all IT functions within the agency except TS grid operations. See the Capital Program – TS section of this budget for additional discussion of grid operations-related IT requirements acquisitions.

Capital equipment provides for the acquisition of general and some dedicated special purchases of capital office furniture and equipment.

Bonneville can incur a bond premium when it repays a U.S. Treasury bond before the due date. When bonds are refinanced and premiums are incurred, the bond premiums can be capitalized. Historically, Bonneville generally has chosen to finance capitalized bond premiums with bonds issued to the U.S. Treasury, as envisioned by the Transmission Act.

**Capital Information Technology & Equipment  
(\$K)**

<b>FY 2019 Actual</b>	<b>FY 2020 Estimate</b>	<b>FY 2021 Estimate</b>
10,029	22,100	22,131

**Overview**

This category includes enhancements to Bonneville’s information technology processes to provide cost effective efficiencies for secure, timely, and accurate information. Investments will enable continued enhancements to Bonneville’s enterprise systems that are designed to link key information systems throughout Bonneville and improve business processes. Current efforts include continued functional process improvements in areas not included in the initial development phase. Other investments include acquisition of capital office furniture and equipment, capital automated data processing (ADP) based administrative telecommunications equipment, ADP equipment (hardware), and support of capital software development for certain Bonneville programs.

Continued investments in Capital IT & Equipment assets include:

*Continuous Activity (all years)*

Capital system developments in support of:

- Corporate IT Projects
- IT Infrastructure Projects
- Power IT Projects
- Transmission Services IT Projects (excluding grid operations)

**Capitalized Bond Premium  
(\$K)**

<b>FY 2019 Actual</b>	<b>FY 2020 Estimate</b>	<b>FY 2021 Estimate</b>
0	0	0

**Overview**

Continue to assess financial market and when cost-effective, refinance available bonds as prudent.

**Activities, Milestones, and Explanation of Changes (\$K)**

FY 2020 Estimate	FY 2021 Estimate	Explanation of Changes FY 2020 vs FY 2019 Estimate
<b>Capital Information Technology &amp; Equipment/Capitalized Bond Premium \$22,100</b>	<b>\$22,131</b>	<b>\$32/0.1%</b>
<b>Capital Information Technology &amp; Equipment \$22,100</b> Milestones: Capital system developments in support of: <ul style="list-style-type: none"> <li>• Corporate IT Projects</li> <li>• IT Infrastructure Projects</li> <li>• Power IT Projects</li> <li>• Transmission Services IT Projects</li> </ul>	<b>\$22,131</b> Milestones: Capital system developments in support of: <ul style="list-style-type: none"> <li>• Corporate IT Projects</li> <li>• IT Infrastructure Projects</li> <li>• Power IT Projects</li> <li>• Transmission Services IT Projects</li> </ul>	<b>\$32/0.1%</b> <ul style="list-style-type: none"> <li>• Virtually no change for investment in the IT system assets.</li> </ul>
<b>Capitalized Bond Premium \$0</b>	<b>\$0</b>	<b>\$0/0.0%</b>

**Power Services – Operating Expense  
Funding Schedule by Activity  
Funding (\$K)**

	FY 2019 Actual	FY 2020 Estimate	FY 2021 Estimate	FY 2021 vs FY 2020	
				\$	%
<b>Power Services - Operating Expenses</b>					
Production	1,067,952	1,089,284	1,126,600	37,317	3.4%
Associated Projects Costs	460,582	459,646	457,660	-1,986	-0.4%
Fish & Wildlife	227,881	248,988	249,416	428	0.2%
Residential Exchange Program	241,276	257,122	255,399	-1,723	-0.7%
NW Power & Conservation Council	11,275	11,725	11,956	231	2.0%
Energy Efficiency & Renewable Resources	141,582	158,053	156,513	-1,540	-1.0%
<b>Total, Power Services - Operating Expenses</b>	<b>2,150,547</b>	<b>2,224,818</b>	<b>2,257,544</b>	<b>32,727</b>	<b>1.5%</b>

**Outyears (\$K)**

	FY 2021 Estimate	FY 2022 Estimate	FY 2023 Estimate	FY 2024 Estimate	FY 2025 Estimate
<b>Power Services - Operating Expenses</b>					
Production	1,126,600	1,128,304	1,131,808	1,138,106	1,146,045
Associated Projects Costs	457,660	467,820	478,253	488,870	499,625
Fish & Wildlife	249,416	254,814	260,355	265,993	271,705
Residential Exchange Program	255,399	261,069	266,891	272,816	278,818
NW Power & Conservation Council	11,956	12,221	12,494	12,771	13,052
Energy Efficiency & Renewable Resources	156,513	159,987	163,555	167,186	170,864
<b>Total, Power Services - Operating Expenses</b>	<b>2,257,544</b>	<b>2,284,216</b>	<b>2,313,355</b>	<b>2,345,743</b>	<b>2,380,108</b>

## **Power Services – Operating Expense**

### **Overview**

Production includes certain Bonneville non-federal debt service (including Energy Northwest debt service), O&M costs for federal base system power system generation resources (including a large nuclear plant (CGS), business operations, and short- and long-term power purchases<sup>3</sup>), electric utility marketing of power, and oversight of the FCRPS hydroelectric projects and CGS. Bonneville develops power products and services to meet the needs of Bonneville's wholesale customers and acquires power as needed.

In FY 2018, Bonneville completed a long-term Resource Program, whose purpose is to assess BPA's future need for power and reserves and to develop an acquisition strategy to meet those projected needs. In the event that Bonneville does acquire output from a generating resource on a long-term basis, Bonneville will comply with section 6 of the Northwest Power Act and will modify its budget to reflect the acquisition.

Associated Projects Costs represents funding for operation and maintenance costs for the FCRPS hydroelectric projects, minor additions, improvements and replacements, and costs of the Corps and the Reclamation hydroelectric projects in the Pacific Northwest, which serve many purposes. All agencies emphasize efficient power production from existing facilities and improvement of the performance and availability of power generating units. Bonneville pays additional financing costs of the FCRPS facilities through its Interest Expense and Capital Transfer budget programs. Bonneville provides funding for the operations and maintenance costs that are part of the USFWS's Lower Snake River Compensation Plan (LSRCP) hatcheries. Bonneville is responsible for annual payments to the Confederated Tribes of the Colville Reservation for their contribution to the production of hydropower by the Grand Coulee Dam in accordance with the Settlement Agreement between the United States and the Colville Tribes (April 1994). Additionally, the Spokane Tribe of Indians of the Spokane Reservation Equitable Compensation Act (Public Law 116-100), enacted on December 20, 2019, provides for equitable compensation to the Spokane Tribe of Indians of the Spokane Reservation for the use of tribal land for the production of hydropower by the Grand Coulee Dam, and for other purposes. Bonneville is pleased that this longstanding issue has been resolved equitably for the Spokane Tribe. The Act provides Bonneville and Northwest electric ratepayers cost certainty on this issue as we move toward discussions of long-term power sales contracts with our utility customers. Bonneville expenditures under the settlement that would begin in FY 2021 are estimated at \$6 million annually.

Bonneville's Fish and Wildlife Program provides for extensive protection, mitigation, and enhancement of Columbia River Basin fish and wildlife adversely affected by the development and operation of the FCRPS. Bonneville satisfies its fish and wildlife responsibilities by funding projects and activities designed to be consistent with the Program under the Northwest Power Act. Through the Program, Bonneville also implements measures to aid in the protection of fish and wildlife in the Columbia River and its tributaries, both listed as threatened or endangered as well as unlisted, under the ESA (see ESA discussion in the Power Services – Capital Overview section).

Bonneville's mitigation expenditures will focus on activities that benefit Columbia River Basin fish and wildlife resources, following priorities established through ESA consultations, agreements with resource managers, and the Program, including actions that:

- increase survival of ESA-listed and non-listed fish at FCRPS dams and reservoirs;
- increase survival of ESA-listed and non-listed fish throughout their life cycle by protecting and enhancing important habitat areas;
- protect and enhance important wildlife habitat;
- use hatcheries to contribute to conservation and recovery of ESA-listed and non-listed fish;
- provide offsite mitigation projects and habitat, passage, and other improvements that address factors limiting improvements of target species; and
- support a focused and well-coordinated research, monitoring, and evaluation program.

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<sup>3</sup> Including expenses associated with the use of power financial instruments to hedge Bonneville's exposure to market price risk and certain index sales contract provisions as permitted by Bonneville's internal power transacting risk management guidance.

The Energy and Water Development Appropriations Act of 1996 added section 4(h)(10)(D) to the Northwest Power Act, directing the Council to appoint an ISRP “to review a sufficient number of projects” proposed to be funded through Bonneville’s annual fish and wildlife budget “to adequately ensure that the list of prioritized projects recommended is consistent with the Program.” The Northwest Power Act further states that “in making its recommendations to Bonneville, the Council shall consider the impact of ocean conditions on fish and wildlife populations and shall determine whether the projects employ cost effective measures to achieve program objectives.” Today, most mitigation projects funded by Bonneville receive ISRP review as part of the Council recommendation process. The Council has shifted to a multi-year project review cycle during which the ISRP reviews categories of projects grouped together.

The Council’s major activities include the periodic preparation of a Northwest Conservation and Electric Power Plan (a 20-year electric energy demand and resources forecast and conservation program – known as the Power Plan) and the Fish and Wildlife Program. The Northwest Power Act directs that expenses of the Council, subject to certain limits based on forecasted Bonneville power sales, shall be included in Bonneville’s annual budget to Congress. The cost of funding the Council is recovered through Bonneville’s power rates.

Bonneville’s Energy Efficiency program promotes the efficient use of energy in the Pacific Northwest and acquires conservation measures as resources. Such actions will: 1) meet energy efficiency targets; 2) achieve a least cost resource mix; 3) lessen the cost impacts of power purchases; 4) avoid the costs of ramping programs and infrastructure up and down; 5) extend the value of the FCRPS to customers; and 6) build the region’s resource portfolio with energy efficiency. Bonneville is also exploring how best to integrate demand-side management, distributed generation, and other leading edge technologies into its generation and transmission planning processes.

Bonneville’s Energy Efficiency program offers several ways for customer utilities to participate in energy efficiency. Program components include: (1) standard offer efficiency measures and custom projects, which result in customer proposals to conserve energy through such programs as residential weatherization; commercial lighting; heating, ventilation, and air conditioning (HVAC); industrial processes and lighting; and irrigated agriculture; (2) third-party delivery programs, such as Simple Steps Smart Savings, Energy Smart Industrial, and the Green Motors programs; and (3) programs to help regional federal installations reduce energy use, including federal hatcheries and irrigation districts, and to support the Corps of Engineers and Bureau of Reclamation in their efforts to reduce energy use; (4) efficiency achieved independently through the market or through codes and standards, i.e. Momentum Savings; and (5) market transformation through the Northwest Energy Efficiency Alliance (NEEA).

Bonneville’s Energy Efficiency budgets reflect BPA’s commitment to provide energy efficiency supportive of the Northwest Power and Conservation Planning Council’s 7th Power Plan which forecasts regional electricity demand and resource strategies for the next 20 years. The 7th Power Plan’s preferred resource strategy calls for the region to acquire 1,400 aMW of energy efficiency between 2016 and 2021. Bonneville is pursuing a plan to achieve a portion of that goal (560-600 aMW). BPA recently updated its Resource Program to complement the Council’s plan, identifying BPA’s specific electricity demand obligations and potential resource strategies.

In meeting its energy efficiency goals, Bonneville may employ resource acquisition agreements, as authorized by Northwest Power Act section 6, and customer self-funded conservation as well as research, evaluation, contract support, NEEA support, and emerging technology development.

The Residential Exchange Program (REP) was created by section 5(c) of the Northwest Power Act to extend the benefits of low-cost federal power to the residential and small farm loads of Pacific Northwest retail electric utilities that have high average system costs. These benefits are passed directly to the consumers. Currently, the region’s six investor-owned utilities (IOUs) and two of the region’s consumer-owned utilities are actively participating in the REP. Payments under the REP are made to individual IOUs based on the difference between Bonneville’s utility-specific Priority Firm (PF) Exchange rates and each utility’s average system cost (ASC), times a utility’s residential and small farm loads. ASCs are determined in accordance with BPA’s 2008 Average System Cost Methodology (ASCM). Participating retail utility ASCs are established in a public process that occurs prior to and during Bonneville’s power rate cases. Bonneville’s utility-specific PF Exchange rates

are determined each rate period. As described below, Bonneville and regional parties reached a settlement of the REP in 2011 under which the total amount of REP benefits available to the IOUs was established through 2028. Payments to the IOUs are made monthly based on historical invoiced exchange loads and the terms of the settlement.

Over the past decade, and prior to the settlement, regional parties filed multiple lawsuits challenging Bonneville's implementation of the REP. These lawsuits were consolidated into four cases that were stayed before the U.S. Court of Appeals for the Ninth Circuit. On July 26, 2011, Bonneville adopted a regionally supported settlement, referred to as the 2012 REP Settlement. Under the settlement, the region's six IOUs will receive about \$4.1 billion in REP payments over the 17-year term of the settlement, beginning at \$182.1 million in FY 2012, and increasing to \$286.1 million in FY 2028. In addition to this settlement, Bonneville has reached related REP settlements with two consumer-owned utilities. A single challenge to the 2012 REP Settlement was dismissed by the U.S. Court of Appeals for the Ninth Circuit in October of 2013.

**Explanation of Changes**

Bonneville's budget includes \$2,257.5 million in FY 2021 for Power Services operating expenses, which is an increase of 1.5 percent over the FY 2020 forecasted level.

The FY 2021 budget increases the level for Production (+\$37.3 million), Fish & Wildlife (+\$0.4 million), and Planning Council (+\$0.2 million) and decreases the Associated Projects Costs (-\$2 million), Residential Exchange (-\$1.7 million), and Conservation and Energy Services (-\$1.5 million).



Production (\$K)		
FY 2019 Actual	FY 2020 Estimate	FY 2021 Estimate
1,067,952	1,089,284	1,126,600

### Overview

Power Purchases: Includes power purchased to cover power sales obligations as well as balancing loads with generation from the hydro system. These power purchases can be made in the form of long-term purchases to meet BPA’s contract obligations to its utility and other customers based on long-term planning requirements or they can be made within the year due to the monthly shape of the customers’ loads and the monthly shape of the hydroelectric generation. Also, power purchases can be made within the month and within the day to fill temporary shortages due to fluctuations in the hydro system capability and in BPA’s load.

Power Scheduling/Marketing: Scheduling and marketing (buy/sell) of electric energy with Bonneville’s customers and the Pacific Northwest’s interconnected utilities. Scheduling includes Power Services’ implementation of physical and memo power schedules and associated transmission schedules, implementation of Electronic Tagging (ETag) in accordance with NERC and in accordance with FERC, and implementation of electronic scheduling.

Columbia Generating Station (CGS): Bonneville has acquired full lifetime project capability of CGS. CGS is on a 24-month fuel and outage cycle. Maintenance and refueling outage occurred in the spring of 2017 and 2019.

Continued investments in Production include:

#### *Continuous Activity (all years)*

- Provide oversight of all power supply contracts and related projects from which Bonneville purchases generation capability to ensure that all Bonneville approval rights are protected; coordinate, communicate, and administer agreements, issues, and programs between Bonneville and the project owners.
- Provide wind resource integration services for wind generation.
- Power Purchases.
- Power Scheduling/Marketing.
- Provide oversight of all contracts signed to date. Pursue cost-effective means to mitigate capacity demands associated with interconnecting large amounts of wind into the Bonneville system.
- Pursue acquisition of additional cost-effective generation to meet load growth.
- Provide oversight on the wind resource integration services currently purchased by public power customers and offer additional renewable resource shaping services to such customers using wind generation to serve their load.

**Associated Projects**  
**(\$K)**

<b>FY 2019 Actual</b>	<b>FY 2020 Estimate</b>	<b>FY 2021 Estimate</b>
460,582	459,646	457,660

**Overview**

Support FCRPS project costs and work to strengthen interagency and regional relationships to improve project performance, supporting functions, and to better understand project resource requirements and costs. This helps to maintain FCRPS reliability and system performance, as well as to attain Bonneville’s strategic business objectives.

Continued investments in Associated Projects include:

*Continuous Activity (all years)*

Bureau of Reclamation:

- Continue direct funding Reclamation O&M power activities.

Corps of Engineers:

- Continue direct funding Corps O&M power activities.

<b>Fish &amp; Wildlife</b>		
(\$K)		
<b>FY 2019 Actual</b>	<b>FY 2020 Estimate</b>	<b>FY 2021 Estimate</b>
227,881	248,988	249,416

**Overview**

Bonneville implements a mature fish and wildlife mitigation program based on recommendations made by the region’s fish and wildlife management agencies and tribes to the Council. Several recent Council reviews have made additional fish and wildlife project recommendations to Bonneville. Bonneville, in coordination with the Council, reviews new and on-going projects for consistency with the Program and purposes of the Northwest Power Act. Bonneville reviews and resets project-specific funding commitments annually, including projects under the FCRPS BiOps and other agreements. Bonneville informs its funding decisions with the management objectives and priorities in the Program (including ISRP reviews) and the Accords extension as it integrates their implementation with actions necessary to fulfill ESA responsibilities. Regular coordination on implementation priorities continues among Bonneville, the Council, federal resource management agencies, states, Tribes, and others.

Continued investments in Fish & Wildlife include:

*Continuous Activity (all years)*

- Anadromous Fish: Continue implementing both ongoing and new projects that support ESA-listed species and other measures called for under the 2019 FCRPS BiOp, the Washington Estuary Agreement, the Kalispel Agreement, and the Willamette and Southern Idaho agreements and 2018 Fish Accord extensions. Prioritize projects that address the factors that contribute most to mitigation success and that fulfill Bonneville’s responsibility for mitigating the impacts from the FCRPS. Implement and develop activities that protect and enhance tributary and estuary habitat, improve mainstream habitat, reduce potentially harmful hatchery practices on ESA-listed populations, and contribute to sustainable fisheries.
- Resident Fish: Implement activities to mitigate the impacts of the FCRPS on lamprey, sturgeon, and bull trout and promote the reproduction and recruitment of Kootenai River white sturgeon. These activities have been selected in response to the USFWS’s 2000 bull trout and 2006 Libby BiOp, the Program, and the 2018 Fish Accord extensions.
- Mitigation using resident fish to offset anadromous fish losses (substitution): mitigate for reservoir power operation impacts to resident fish and wildlife by seeking projects that benefit both simultaneously. Those resident fish habitat acquisition projects that meet Bonneville’s Capitalization Policy will be funded under the capital portion of Bonneville’s Fish and Wildlife budget and credited for both fish and wildlife where appropriate.
- Wildlife: Use existing Bonneville policies to continue the current effort to mitigate wildlife in a manner consistent with the Program and fulfill commitments in wildlife agreements such as the Kalispel Agreement, Willamette Wildlife Agreement, and Southern Idaho Wildlife Agreement. Those wildlife projects that meet Bonneville’s Capitalization Policy will be funded under the capital portion of Bonneville’s Fish and Wildlife budget and credited against both wildlife and fish obligations according to Bonneville’s crediting policy and applicable mitigation contracts.

**Residential Exchange, Northwest Power and Conservation Council, and Energy Efficiency & Renewable Resources**  
**(\$K)**

<b>FY 2019 Actual</b>	<b>FY 2020 Estimate</b>	<b>FY 2021 Estimate</b>
394,133	426,900	423,868

**Overview**

**Residential Exchange Program (REP)**

- Includes forecasted REP benefits based on the 2012 REP Settlement.

**Northwest Power and Conservation Council**

- Continue support of the Council activities, as directed under the Northwest Power Act, including regional power plan development and maintenance and fish and wildlife program activities.

**Energy Efficiency Resources**

- Conservation Purchases: Provide programmatic savings reimbursements and energy efficiency incentives to Bonneville customers to purchase conservation savings. This includes performance payments and Energy Smart Reserved Power payments for federal installations and fish hatcheries and irrigation districts.
- Conservation Infrastructure: All support for programs and operations, including third-party program implementation, contract support, market research (Momentum Savings research), evaluation, and emerging technology research.
- Market Transformation: Support for NEEA’s market transformation initiatives. NEEA identifies barriers and opportunities to increase the market adoption of efficiency by leveraging its regional partnerships.

**Activities, Milestones, and Explanation of Changes (\$K)**

FY 2020 Estimate	FY 2021 Estimate	Explanation of Changes FY 2021 vs FY 2020 Estimate
<b>Power Services - Operating Expense \$2,224,818</b>	<b>\$2,257,544</b>	<b>\$32,727/1.5%</b>
<b>Production \$1,089,284</b> Milestones: <ul style="list-style-type: none"> <li>Continue to provide oversight of all signed contracts.</li> <li>Continue to provide wind resource integration services for customer wind generation.</li> </ul>	<b>\$1,126,600</b> Milestones: <ul style="list-style-type: none"> <li>Continue to provide oversight of all signed contracts.</li> <li>Continue to provide wind resource integration services for customer wind generation.</li> </ul>	<b>\$37,317/3.4%</b> <ul style="list-style-type: none"> <li>The increase is primarily due to higher CGS and support costs.</li> </ul>
<b>Associated Project Costs \$459,646</b> Milestones: <ul style="list-style-type: none"> <li>Continue direct funding of Corps and Reclamation O&amp;M power activities.</li> </ul>	<b>\$457,660</b> Milestones: <ul style="list-style-type: none"> <li>Continue direct funding of Corps and Reclamation O&amp;M power activities.</li> </ul>	<b>\$-1,986/-0.4%</b> <ul style="list-style-type: none"> <li>The small decrease reflects changes to security, biological opinion requirements, non-routine extraordinary maintenance, WECC/NERC compliance activities, and improvements, replacements, and minor additions at the projects.</li> </ul>
<b>Fish &amp; Wildlife Costs \$248,988</b> Milestones: <ul style="list-style-type: none"> <li>Continue implementing both ongoing and new projects that support ESA-listed species and other measures called for under the 2008, 2010, and 2014 FCRPS BiOps, the 2018 Fish Accord extensions, the Washington Estuary Agreement, the Kalispel Agreement, the Southern Idaho Agreement, and the Willamette Agreement.</li> </ul>	<b>\$249,416</b> Milestones: <ul style="list-style-type: none"> <li>Continue implementing both ongoing and new projects that support ESA-listed species and other measures called for under the 2008, 2010, and 2014 FCRPS BiOps, the 2018 Fish Accord extensions, the Washington Estuary Agreement, the Kalispel Agreement, the Willamette Agreement, and the Southern Idaho Agreement.</li> </ul>	<b>\$428/0.2%</b> <ul style="list-style-type: none"> <li>No material change in funding. The costs reflect funding associated with the Biological Opinions, 2018 Fish Accord extension commitments, and Northwest Power Act activities.</li> </ul>

FY 2020 Estimate	FY 2021 Estimate	Explanation of Changes FY 2021 vs FY 2020 Estimate
<b>Residential Exchange Program \$257,122</b> Milestones: <ul style="list-style-type: none"> <li>Continue to provide REP benefits.</li> </ul>	<b>\$255,399</b> Milestones: <ul style="list-style-type: none"> <li>Continue to provide REP benefits.</li> </ul>	<b>\$-1,723/-0.7%</b> <ul style="list-style-type: none"> <li>The decrease reflects the lower scheduled in the amount of REP payments payable to the IOUs prescribed by the Residential Exchange Settlement.</li> </ul>
<b>NW Power &amp; Conservation Council \$11,725</b> Milestones: <ul style="list-style-type: none"> <li>Continue support of the Council activities, as directed under the Northwest Power Act, including regional power plan development and maintenance, and fish and wildlife program activities.</li> </ul>	<b>\$11,956</b> Milestones: <ul style="list-style-type: none"> <li>Continue support of the Council activities, as directed under the Northwest Power Act, including regional power plan development and maintenance, and fish and wildlife program activities.</li> </ul>	<b>\$231/2.0%</b> <ul style="list-style-type: none"> <li>No material change in funding. The increase reflects continuing emphasis on the NW Power and Conservation Council.</li> </ul>
<b>Energy Efficiency &amp; Renewable Resources \$158,053</b> Milestones: <ul style="list-style-type: none"> <li>Continue close-out of the legacy conservation resource acquisition contracts, which support Bonneville’s contractual obligation to serve customer loads.</li> <li>Continue to support utility incentive programs.</li> <li>Continue to support regional energy efficiency programs.</li> <li>Continue supporting energy efficiency at direct serve federal agencies.</li> </ul>	<b>\$156,513</b> Milestones: <ul style="list-style-type: none"> <li>Continue close-out of the legacy conservation resource acquisition contracts, which support Bonneville’s contractual obligation to serve customer loads.</li> <li>Continue to support utility incentive programs.</li> <li>Continue to support regional energy efficiency programs.</li> <li>Continue supporting energy efficiency at direct serve federal agencies.</li> </ul>	<b>\$-1,540/-1.0%</b> <ul style="list-style-type: none"> <li>The decrease reflects our cost cutting effort while continuing emphasis on the energy efficiency program consistent with the Power Plan.</li> </ul>

**Transmission Services – Operating Expense  
Funding Schedule by Activity  
Funding (\$K)**

	FY 2019 Actual	FY 2020 Estimate	FY 2021 Estimate	FY 2021 vs FY 2020	
				\$	%
<b>Transmission Services - Operating Expense</b>					
Engineering	77,418	76,289	82,689	6,399	8.4%
Operations	193,500	199,231	193,883	-5,348	-2.7%
Maintenance	207,553	204,652	205,039	387	0.2%
<b>Total, Transmission Services - Operating Expense</b>	<b>478,471</b>	<b>480,172</b>	<b>481,610</b>	<b>1,438</b>	<b>0.3%</b>

	Outyears (\$K)				
	FY 2021 Estimate	FY 2022 Estimate	FY 2023 Estimate	FY 2024 Estimate	FY 2025 Estimate
<b>Transmission Services - Operating Expense</b>					
Engineering	82,689	84,362	86,076	87,820	89,585
Operations	193,883	196,679	199,531	202,424	205,351
Maintenance	205,039	208,412	211,858	215,358	218,901
<b>Total, Transmission Services - Operating Expense</b>	<b>481,610</b>	<b>489,453</b>	<b>497,466</b>	<b>505,602</b>	<b>513,837</b>

## **Transmission Services – Operating Expense**

### **Overview**

This activity provides for the transmission system services of engineering, operations, and maintenance for Bonneville's electric transmission system, and the associated power system control and communication facilities. Primary goals of this program are: 1) maintain the safety and reliability of the transmission system; 2) increase the focus on meeting customers' needs; 3) optimize the transmission system; 4) provide open and non-discriminatory transmission access; and 5) improve Bonneville's cost effectiveness. Consistent with the FY 2018, FY 2019, and FY 2020 Budget Requests, the FY 2021 Budget Request maintains the proposal that the Federal government be authorized to sell the transmission assets of Bonneville.

### **Explanation of Changes**

Bonneville's budget includes \$481.6 million in FY 2021 for TS operating expense which is a 0.3 percent increase over the FY 2020 forecasted level. The increase still continues the operation and maintenance of Bonneville's transmission assets.

The FY 2021 budget increases the levels for Engineering (+\$6.4 million) and Maintenance (+\$0.4 million) and decreases the level for Operations (-\$5.3 million).



Engineering (\$K)		
FY 2019 Actual	FY 2020 Estimate	FY 2021 Estimate
77,418	76,289	82,689

### Overview

Continue efforts to identify best methods for improving system reliability and maintenance practices, and continue cost reduction efforts by identifying opportunities for low-cost reinforcement and voltage support of the existing transmission system.

Continued investments in Engineering include:

#### *Continuous Activity (all years)*

- **Research and Development (R&D):** Conduct research focused on technologies related to business challenges Bonneville faces including reliability, energy efficiency, and integration of renewable energy resources. Technologies of interest are identified in Bonneville's Technology Roadmaps. A portfolio of research is selected every year through Bonneville's Portfolio Decision Framework.
- **System Development Planning and Analysis:** Continue providing technical support and asset planning to deploy the Asset Management approach to sustain existing assets and expand the system to meet Agency objectives.
- **Technical Support:** Provide technical support activities, such as transmission system planning and studies to optimize portions of the system. Provide support for non-wires solutions studies and pilot projects.
- **Capital-to-Expense Adjustments:** Conduct annual analysis of Bonneville's outstanding capital work orders to assess whether they should be expensed. As obsolete inventory is identified and disposed of, it is expensed.
- **Regulatory Fees:** WECC dues and loop flow payments, Department of Commerce/National Telecommunications and Information Administration licensing costs for radio frequencies, DOE Radio Spectrum staff and contractor support, and NERC Critical Infrastructure Protection (CIP) compliance program costs. Includes membership in ColumbiaGrid, a transmission planning organization in the region.
- **Reimbursable Transactions:** Enter into written agreements with federal and non-federal entities that have work or services to be performed by Bonneville staff at the expense of the benefiting entities. The projects must be beneficial, under agreed upon criteria, to Bonneville operations and to the federal or non-federal entity involved or otherwise be aligned with or supportive of Bonneville's strategic objectives. Additionally, these activities generally contribute to more efficient or reliable construction of the federal transmission system or otherwise enhance electric service to the region.
- **Leased and Other Costs:** Includes leases, lease purchases, and other costs of financing transmission, delivery, and voltage support facilities when such arrangements are operationally feasible and cost effective to deliver power. Leases and lease purchases enable Bonneville to continue to invest in infrastructure to support a safe and reliable system for the transmission of power. Other costs included are the accrued interest costs associated with Large Generator Interconnection Agreements (LGIA).

Operations (\$K)		
FY 2019 Actual	FY 2020 Estimate	FY 2021 Estimate
193,500	199,231	193,883

### Overview

**Substation Operations:** Perform operations functions necessary to provide electric service to customers and to protect the federal investment in electric equipment and other facilities. Includes equipment adjustments, switching lines and equipment during emergencies or maintenance, isolating damaged equipment, restoring service to customers, inspecting equipment, and reading meters.

**Power System Dispatching and Supporting Functions:** Perform central dispatching, control, and monitoring of the electric operation of the federal transmission system. Also includes load, frequency, and voltage control of federal generating plants, and coordinating long- and short-term outages of system equipment. In addition, provides technical engineering support of dispatching function and provides all technical and systems support for Dittmer Control Center (DCC) and Munro Control Center (MCC).

**Marketing and Sales:** Provide management and direction of transmission rates, and provide business strategy in marketing of transmission and ancillary products and services of Transmission Services. Involve customers and constituents in the process of product and rate development. Maintain accurate and complete historical records of current and past legacy transmission agreements. Provide guidance for current and future transmission contract negotiations. Provide financial analysis of market strategies. Monitor and report on the financial health of Transmission Services. Support cost management by effective reporting and analysis of current expenditures. Ensure official budget submittals reflect current management financial strategies and adequately fund transmission programs.

**Transmission Scheduling:** Provide non-discriminatory, open access to the Bonneville transmission system consistent with Bonneville's Open Access Transmission Tariff (OATT). Schedule transmission capacity to eligible Bonneville customers, which include customers acquiring services under Use of Facilities (UFT), Formula Power Transmission (FPT), Integration of Resources (IR), and Part II or Part III of the OATT. Manage the reservations and scheduling of all transmission services associated with the OATT. Update practices, policies, and commercial systems to accommodate a large diversity of resources, including wind.

#### *Continuous Activity (all years):*

- Continue to operate within parameters of NERC and WECC.
- Continue support of increased compliance activities related to the reliability of the transmission system, including cyber security.
- Continue developing facilities, policies, procedures, and implementing systems to support integrating the diversity of resources into the transmission grid.
- Continue preparation for increased complexity of transmission scheduling, power system operations, and dispatching, including congestion management and outage scheduling.
- Continue developing the Dittmer Scheduling Center and Munro Scheduling Center facilities to support continuous real time scheduling operations from both facilities.
- Continue developing a long-term approach to optimize transmission availability through streamlined, cost-effective, and sustainable processes.
- Continue to address succession planning issues across key functions.
- Continue development and implementation of business systems and tools.

Maintenance (\$K)		
FY 2019 Actual	FY 2020 Estimate	FY 2021 Estimate
207,553	204,652	205,039

## Overview

In all aspects of maintenance, Bonneville is continuing the use of Reliability Centered Maintenance (RCM) practices. The use of RCM practices is focused on improving system reliability, increasing availability, and meeting new and existing compliance regulations at lowest lifecycle costs. In addition Bonneville is deploying Asset Management to optimize maintain/replace decision making. Maintenance costs are expected to increase as Bonneville addresses the aging transmission system, meeting reliability standards, including vegetation management, and environmental constraints associated with construction, enhancement, and maintenance of the system. The Bonneville transmission system encompasses 15,238 circuit miles on over 11,860 right-of-way miles (many of these miles are through rugged, inaccessible terrain).

Continued investments in Maintenance include:

### *Continuous Activity (all years)*

- Continue to improve performance to meet System Average Interruption Frequency Index (SAIFI) and System Average Interruption Duration Index (SAIDI) targets.
- Continue refining processes and procedures for monitoring and tracking compliance activities related to the reliability of the transmission system.
- Continue to improve system availability performance through new maintenance procedures and work practices.
- Continue to develop and implement work practices and procedures for implementation of a new specialty crew using bare-hand live line practices for maintenance of high-voltage transmission lines.
- Continue increased emphasis on replacement of line hardware (life extension programs for insulators, connectors, dampers, and fiber optic cable hardware).
- Continue to prepare for the impact of an expected high attrition rate among Bonneville’s aging workforce by recruiting apprentices and replacements for critical minimum crew size workload positions.
- Increase outage-scheduling planning and coordination to increase customer satisfaction and system availability.
- Maintain vegetation management levels to ensure system reliability.
- Continue access road work to provide reliable access to facilities and ensure environmental compliance.
- Continue improving environmental stewardship.

Transmission Line Maintenance: Maintain and repair 15,238 circuit miles of high voltage transmission lines, of which over 4,734 circuit miles are 500 kV transmission extra-high voltage (EHV). Maintenance of EHV lines is two and one-half times more labor-intensive than maintenance of lower transmission voltages, although more efficient in transmission of power. This responsibility includes maintaining transmission rights-of-way to ensure system reliability, safety, and environmental compliance. Adopt work practices that improve system availability, reliability, and compliance.

Right-of-Way Maintenance: Maintain over 11,860 of Bonneville’s right-of-way miles. This responsibility includes vegetation management, danger tree management, and access road maintenance to ensure system reliability, safety, and environmental compliance. Adopt procedures and processes that improve system availability, reliability, environmental compliance, and reliability compliance. Continue to deploy new technologies such as LiDAR (Light Detection and Ranging) to reliably and cost-effectively manage vegetation.

Substation Maintenance: Maintain and repair the transmission system power equipment located in Bonneville’s 260 substations. Work includes inspections, diagnostic testing, and predictive and condition-based maintenance.

System Protection Maintenance: Maintain relaying metering and remedial action scheme equipment used to control and protect the electrical transmission system and to meter energy transfers for the purpose of revenue billing. Additionally,

field-engineering services provide technical advice and assure the correct operation of power system relaying and special control systems used to support interregional energy transmission capabilities.

Power System Control Maintenance: Test, repair, and provide field engineering support of Bonneville’s highly complex equipment, communications, and control systems, including seven major microwave systems, fiber optic systems, and other critical communications and control equipment that support the power system.

Non-Electric Plant Maintenance: Maintain and manage Bonneville’s non-electric facilities. Includes site, building, and building utility maintenance; custodial services; station utility; and other maintenance service activities, as well as facilities asset management on Bonneville-owned or Bonneville-leased non-electric facilities.

Maintenance Standards and Engineering: Establish, monitor, and update system maintenance standards, policies, and procedures, and review and update long-range plans for maintenance of the electric power transmission system.

**Activities, Milestones, and Explanation of Changes (\$K)**

FY 2020 Estimate	FY 2021 Estimate	Explanation of Changes FY 2021 vs FY 2020 Estimate
<b>Transmission Services - Operating Expense</b> <b>\$480,172</b>	<b>\$481,610</b>	<b>\$1,438/0.3%</b>
<b>Engineering \$76,289</b> Milestones: <ul style="list-style-type: none"> <li>Continue efforts to identify best methods for improving system reliability and maintenance practices.</li> <li>Continue cost reduction efforts by identifying opportunities for low-cost reinforcement and voltage support of the existing transmission system.</li> </ul>	<b>\$82,689</b> Milestones: <ul style="list-style-type: none"> <li>Continue efforts to identify best methods for improving system reliability and maintenance practices.</li> <li>Continue cost reduction efforts by identifying opportunities for low-cost reinforcement and voltage support of the existing transmission system.</li> </ul>	<b>\$6,399/8.4%</b> <ul style="list-style-type: none"> <li>The increase reflects continued emphasis on system reliability standards compliance and research and development.</li> </ul>
<b>Operations \$199,231</b> Milestones: <ul style="list-style-type: none"> <li>Continue to operate within parameters of NERC and WECC.</li> <li>Continue support of increased compliance activities related to the reliability of the transmission system including cyber security.</li> </ul>	<b>\$193,883</b> Milestones: <ul style="list-style-type: none"> <li>Continue to operate within parameters of NERC and WECC.</li> <li>Continue support of increased compliance activities related to the reliability of the transmission system including cyber security.</li> </ul>	<b>\$-5,348/-2.7%</b> <ul style="list-style-type: none"> <li>The decrease reflects our tightening costs effort and emphasis on reliability compliance activities, resource integration activities, key strategic initiative, security, and control center systems support.</li> </ul>
<b>Maintenance \$204,652</b> Milestones: <ul style="list-style-type: none"> <li>Continue to improve performance to meet System Average Interruption Frequency Index (SAIFI) and System Average Interruption Duration Index (SAIDI) targets.</li> </ul>	<b>\$205,039</b> Milestones: <ul style="list-style-type: none"> <li>Continue to improve performance to meet System Average Interruption Frequency Index (SAIFI) and System Average Interruption Duration Index (SAIDI) targets.</li> </ul>	<b>\$387/0.2%</b> <ul style="list-style-type: none"> <li>The increase reflects implementation of facilities asset management plans, continued implementation of live-line crew, NERC/WECC compliance activities related to land rights and vegetation management, continuing maintenance program activities, including system protection, right-of-way, line maintenance, and performance improvements.</li> </ul>

**Interest, Pension, and Post-retirement Benefits  
Operating Expense  
Funding Schedule by Activity  
Funding (\$K)**

	FY 2019 Actual	FY 2020 Estimate	FY 2021 Estimate	FY 2021 vs FY 2020	
				\$	%
<b>Interest, Pension, and Post-retirement Benefits</b>					
BPA Bond Interest (Net)	179,453	119,928	138,612	18,684	15.6%
BPA Appropriation Interest	30	0	0	0	0.0%
Corps of Engineers Appropriation Interest	51,130	54,930	57,490	2,560	4.7%
Lower Snake River Comp Plan Interest	183	139	139	0	0.0%
Bureau of Reclamation Appropriation Interest	1,153	1,150	1,150	0	0.0%
Bond Premiums Paid/Discounts (not capitalized)	(288)	559	559	0	0.0%
<b>Subtotal, Interest – Operating Expense</b>	<b>231,662</b>	<b>176,705</b>	<b>197,950</b>	<b>21,245</b>	<b>12.0%</b>
Additional Pension, and Post-retirement Benefits	41,298	38,015	40,124	2,109	5.5%
<b>Total, Interest, Pension, and Post-retirement Benefits</b>	<b>272,960</b>	<b>214,720</b>	<b>238,074</b>	<b>23,354</b>	<b>10.9%</b>

**Outyears (\$K)**

	FY 2021 Estimate	FY 2022 Estimate	FY 2023 Estimate	FY 2024 Estimate	FY 2025 Estimate
<b>Interest, Pension, and Post-retirement Benefits</b>					
BPA Bond Interest (Net)	138,612	203,498	232,442	261,073	295,652
BPA Appropriation Interest	0	0	0	0	0
Corps of Engineers Appropriation Interest	57,490	58,180	59,077	60,631	63,530
Lower Snake River Comp Plan Interest	139	139	139	139	139
Bureau of Reclamation Appropriation Interest	1,150	1,150	1,150	1,150	1,150
Bond Premiums Paid/Discounts (not capitalized)	559	9,411	12,470	1,951	559
<b>Subtotal, Interest – Operating Expense</b>	<b>197,950</b>	<b>272,379</b>	<b>305,278</b>	<b>324,944</b>	<b>361,029</b>
Additional Pension, and Post-retirement Benefits	40,124	41,015	41,929	42,860	43,803
<b>Total, Interest, Pension, and Post-retirement Benefits</b>	<b>238,074</b>	<b>313,394</b>	<b>347,207</b>	<b>367,804</b>	<b>404,833</b>

## **Interest, Pension and Post-retirement Benefits Operating Expense**

### **Overview**

Interest expense provides for interest due on bonds issued to the U.S. Treasury and appropriations repayment responsibilities. The appropriation repayments relate to capital investment in FCRPS hydroelectric generating and transmission facilities of Bonneville, and the Corps and Reclamation. Investments were financed by Congressional appropriations and Bonneville borrowings from the U.S. Treasury. Bonneville repays these amounts through revenue raised in its power sales and transmission services revenues.

Since initially receiving U.S. Treasury borrowing authority in 1974 under the Transmission Act, all of Bonneville's U.S. Treasury borrowing has been at market rates. As of October 1, 1996, all of Bonneville's repayment obligations on FCRPS appropriated investment (Corps and Reclamation FCRPS investment and Bonneville investment financed with appropriations prior to the Transmission Act that were unpaid as of September 30, 1996) were restructured and assigned new current-market interest rates. The Bonneville Appropriations Refinancing Act of 1996 (Refinancing Act) called for re-setting (reducing) the unpaid principal of FCRPS appropriations and reassigning (increasing) interest rates. New principal amounts were established as of the beginning of FY 1997 at the present value of the principal and annual interest payments Bonneville would make to the U.S. Treasury for these obligations in the absence of the legislation, plus \$100.0 million. The new principal amounts were assigned prevailing market interest rates as of October 1, 1996. Bonneville's outstanding appropriations repayment obligations at the end of FY 1996 were \$6.7 billion with a weighted average interest rate of 3.4 percent. The refinancing reduced the principal amount to \$4.1 billion with a weighted average interest rate of 7.1 percent. Implementation of the refinancing took place in 1997 after audited actual financial data were available. Pursuant to the legislation, Bonneville submitted its calculations and interest rate assignments implementing the Refinancing Act to the U.S. Treasury for its review and approval. The U.S. Treasury approved the implementation calculations in July 1997. The Refinancing Act also calls for all future FCRPS appropriations to be assigned prevailing U.S. Treasury yield curve interest rates. Bonneville's outstanding appropriations may be prepaid prior to their stated maturities.

Interest estimates are a function of costs of U.S. Treasury borrowing to Bonneville, repayment status of outstanding FCRPS investments, and projected additions to FCRPS plant in service. These estimates may change over time depending on forecasted market conditions. The interest cost estimates include the impact of Bonneville's appropriation refinancing legislation.

Federal employees associated with the operation of the FCRPS participate in either the Civil Service Retirement System or the Federal Employees Retirement System. Employees may also participate in the Federal Employees Health and Benefit Program and the Federal Employee Group Life Insurance Program. As a Federal agency, all post-retirement activity is managed by the Office of Personnel Management; therefore, neither the assets of the plans or the accumulated plan benefits are recorded by Bonneville. Since 1997, Bonneville has made additional annual contributions to the General Fund of the U.S. Treasury (receipt account 892889) related to the Federal post-retirement benefit programs provided to employees associated with the operation of the FCRPS.

**Capital Transfers  
Funding Schedule by Activity  
Funding (\$K)**

**Capital Transfers**

	FY 2019 Actual	FY 2020 Estimate	FY 2021 Estimate	FY 2021 vs FY 2020	
				\$	%
BPA Bond Amortization <sup>1</sup>	506,000	350,933	401,721	50,788	14.5%
Reclamation Appropriation Amortization	2,976	0	0	0	0.0%
BPA Appropriation Amortization	421	0	0	0	0.0%
Corps Appropriation Amortization	224,033	0	0	0	0.0%
Lower Snake River Comp Plan Amortization	74	0	0	0	0.0%
<b>Total, Capital Transfers</b>	<b>733,505</b>	<b>350,933</b>	<b>401,721</b>	<b>50,788</b>	<b>14.5%</b>

**Outyears (\$K)**

**Capital Transfers**

	FY 2021 Estimate	FY 2022 Estimate	FY 2023 Estimate	FY 2024 Estimate	FY 2025 Estimate
BPA Bond Amortization <sup>1</sup>	401,721	370,837	329,598	313,705	300,902
Reclamation Appropriation Amortization	0	0	0	0	0
BPA Appropriation Amortization	0	0	0	0	0
Corps Appropriation Amortization	0	0	0	0	0
Lower Snake River Comp Plan Amortization	0	0	0	0	0
<b>Total, Capital Transfers</b>	<b>401,721</b>	<b>370,837</b>	<b>329,598</b>	<b>313,705</b>	<b>300,902</b>

**Overview**

This activity conveys funds to the U.S. Treasury for repayment of certain FCRPS costs not included in the Associated Project Costs budget. Since capital transfers are cash transactions, they are not considered budget obligations.

<sup>1</sup> Bonneville "Bond(s)" in this FY 2021 Budget refers to all bonds issued by Bonneville to and advances received from the U.S. Treasury. This reference is consistent with section 13(a) of the Transmission Act (P.L. 93-454), which defines Bonneville bonds as all bonds, notes, and other evidences of indebtedness issued and sold by Bonneville to the U.S. Treasury.



*Additional Tables*

**BONNEVILLE POWER ADMINISTRATION  
TOTAL OBLIGATIONS/OUTLAYS**

Current Services  
(in millions of dollars)

BP-1 SUMMARY<sup>1/3/</sup>

	2019		2020		2021		2022	2023	2024	2025
	Oblig.	Outlays	Oblig.	Outlays	Oblig.	Outlays	Oblig.	Oblig.	Oblig.	Oblig.
1 Residential Exchange Program	241	241	257	257	255	255	261	267	273	279
2 Power Services <sup>2/</sup>	1,595	1,595	1,550	1,550	1,585	1,585	1,596	1,610	1,627	1,646
3 Transmission Services	671	671	949	949	956	956	957	1,005	1,031	1,001
4 Conservation & Energy Efficiency	142	142	158	158	157	157	160	164	167	171
5 Fish & Wildlife	250	250	296	296	297	297	298	303	306	312
6 Interest/ Pension <sup>4/</sup>	273	273	215	215	238	238	313	347	368	405
7 Associated Project Cost - Capital	200	200	238	238	256	256	281	300	306	313
8 Capital Equipment	10	10	22	22	22	22	22	22	21	20
9 Planning Council	11	11	12	12	12	12	12	12	13	13
10 Projects Funded in Advance	239	239	86	86	66	66	60	40	40	41
11 Capitalized Bond Premiums	0	0	0	0	0	0	0	0	0	0
<b>12 TOTAL OBLIGATIONS/ OUTLAYS<sup>3/</sup></b>	<b>3,631</b>	<b>3,631</b>	<b>3,783</b>	<b>3,783</b>	<b>3,844</b>	<b>3,844</b>	<b>3,962</b>	<b>4,070</b>	<b>4,152</b>	<b>4,200</b>

**REVENUES AND REIMBURSEMENTS**

Current Services  
(in millions of dollars)

FISCAL YEAR

BP-1 SUMMARY	2019		2020		2021		2022	2023	2024	2025
	Oblig.	Outlays	Oblig.	Outlays	Oblig.	Outlays	Oblig.	Oblig.	Oblig.	Oblig.
13 Revenues <sup>5/</sup>	3,684	3,684	3,860	3,860	3,888	3,888	3,934	3,977	3,992	4,016
14 Project Funded in Advance	239	239	86	86	66	66	60	40	40	41
15 <b>TOTAL</b>	<b>3,923</b>	<b>3,923</b>	<b>3,946</b>	<b>3,946</b>	<b>3,954</b>	<b>3,954</b>	<b>3,994</b>	<b>4,017</b>	<b>4,032</b>	<b>4,057</b>
16 <b>BUDGET AUTHORITY (NET)</b> <sup>6/</sup>	<b>(4)</b>		<b>425</b>		<b>398</b>		<b>443</b>	<b>543</b>	<b>579</b>	<b>559</b>
17 <b>OUTLAYS (NET)</b> <sup>6/7/8</sup>		<b>67</b>		<b>(163)</b>		<b>(110)</b>	<b>(33)</b>	<b>53</b>	<b>120</b>	<b>143</b>

**These notes are an integral part of this table.**

<sup>1/</sup> This FY 2021 budget includes capital and expense estimates based on final spending proposals from Bonneville's 2018 IPR process.

Capital funding levels reflect external factors such as the significant changes affecting West Coast power and transmission markets, along with planned infrastructure investments designed to address the long-term needs of the region.

Budget estimates included in this budget are subject to change due to rapidly changing economic and institutional conditions in the evolving electric utility industry.

<sup>2/</sup> Power Services doesn't include Fish & Wildlife, Residential Exchange Program, Planning Council, Conservation & Energy Efficiency and Associated Project Costs which have been shown separately for display purposes.

Bonneville makes an accounting adjustment to the production services component of FY 2019 Bonneville's audited actual obligations. This past year adjustment relates primarily to long-term obligation requirements consistent with Bonneville's FY 2019 Combined Schedules of Budgetary Resources and the GTAS FY 2019 Treasury reports for Bonneville.

<sup>3/</sup> This budget has been prepared in accordance with PAYGO. Under PAYGO all Bonneville budget estimates are treated as mandatory and are not subject to the discretionary caps included in the Budget Control Act of 2011. These estimates support activities that are separate from discretionary activities and accounts. Thus, any changes to Bonneville estimates cannot be used to affect any other budget categories which have their own dollar caps. Because Bonneville's obligations are and will be incurred under pre-existing legislative authority, Bonneville is not subject to a "pay-as-you-go" test regarding its revision of current-law funding estimates.

<sup>4/</sup> See Interest Expense, Pension and Post-retirement Benefits and Capital Transfers section of this budget for a complete discussion of these cost estimates.

<sup>5/</sup> Revenues, included in the Net Outlay formulation, are calculated consistent with cash management goals and assume a combination of adjustments. Assumed adjustments include the use of a combination of tools, including upcoming rate adjustment mechanisms, a net revenue risk adjustment, debt service refinancing strategies and/or short-term financial tools to manage net revenues and cash. Some of these potential tools will reduce costs rather than generate revenue, causing the same Net Outlay result. Adjustments for depreciation and 4(h)(10)(C) credits of the Northwest Power Act are also assumed.

<sup>6/</sup> Bonneville received \$48.7 million of additional budget authority in FY 2007 to accommodate the work necessary to relocate the radio spectrum consistent with the Commercial Spectrum Enhancement Act (P.L. 108-494). In accordance with Federal law, Bonneville plans to return the forecasted unused balance of approximately \$8.2 million to the U.S. Treasury as soon as the National Telecommunications Information Administration notifies the Federal Communications Commission that the DOE relocation effort is complete.

<sup>7/</sup> Net Outlay estimates are based on current cost savings to date and anticipated cash management goals. They are expected to follow anticipated management decisions throughout the rate period that, along with actual market conditions, will impact revenues and expenses. Actual Net Outlays are volatile and are reported in Report on Budget Execution and Budgetary Resources (SF-133). Actual Net Outlays could differ from estimates due to changing market conditions, streamflow variability, continued restructuring of the electric industry, and other reasons.

<sup>8/</sup> FY 2019 Net Outlays are calculated using Bonneville's audited actual revenue. FYs 2020 to 2025 Net Outlays are based on 2018 final IPR assumptions and an escalation factor from using the FY 2018 White Book Loads and Resources Report

**EXPENSED OBLIGATIONS/OUTLAYS <sup>1,4/</sup>**  
**Current Services**  
(in millions of dollars)  
**FISCAL YEAR**

BP-2

	2019		2020		2021		2022	2023	2024	2025
	Oblig.	Outlays	Oblig.	Outlays	Oblig.	Outlays	Oblig.	Oblig.	Oblig.	Oblig.
1 Residential Exchange Program	241	241	257	257	255	255	261	267	273	279
2 Power Services <sup>2/</sup>	1,595	1,595	1,550	1,550	1,585	1,585	1,596	1,610	1,627	1,646
3 Transmission Services	478	478	480	480	482	482	489	497	506	514
4 Conservation & Energy Efficiency	142	142	158	158	157	157	160	164	167	171
5 Fish & Wildlife	228	228	249	249	249	249	255	260	266	272
6 Interest/ Pension <sup>3/</sup>	273	273	215	215	238	238	313	347	368	405
7 Planning Council	11	11	12	12	12	12	12	12	13	13
8 TOTAL EXPENSE	2,968	2,968	2,921	2,921	2,978	2,978	3,087	3,158	3,219	3,299
9 Projects Funded in Advance	239	239	86	86	66	66	60	40	40	41

**CAPITAL OBLIGATIONS/OUTLAYS<sup>1/</sup>**

Current Services

(in millions of dollars)

**FISCAL YEAR**

	2019		2020		2021		2022	2023	2024	2025
	Oblig.	Outlays	Oblig.	Outlays	Oblig.	Outlays	Oblig.	Oblig.	Oblig.	Oblig.
10 Transmission Services	192	192	469	469	474	474	468	507	525	487
11 Associated Project Cost	200	200	238	238	256	256	281	300	306	313
12 Fish & Wildlife	22	22	47	47	47	47	43	43	40	40
13 Capital Equipment	10	10	22	22	22	22	22	22	21	20
14 Capitalized Bond Premiums	0	0	0	0	0	0	0	0	0	0
15 <b>TOTAL CAPITAL INVESTMENTS</b>	<b>424</b>	<b>424</b>	<b>776</b>	<b>776</b>	<b>800</b>	<b>800</b>	<b>814</b>	<b>872</b>	<b>893</b>	<b>860</b>
16 <b>TREASURY BORROWING AUTHORITY TO</b>										
17 <b>FINANCE CAPITAL OBLIGATIONS<sup>4/</sup></b>	<b>424</b>		<b>776</b>		<b>800</b>		<b>814</b>	<b>872</b>	<b>893</b>	<b>860</b>

**These notes are an integral part of this table.**

<sup>1/</sup> This FY 2021 budget includes capital and expense estimates based on final spending proposals from Bonneville's 2018 IPR process.

Capital funding levels reflect external factors such as the significant changes affecting West Coast power and transmission markets, along with planned infrastructure investments designed to address the long-term needs of the region.

Budget estimates included in this budget are subject to change due to rapidly changing economic and institutional conditions in the evolving electric utility industry.

<sup>2/</sup> Power Services doesn't include Fish & Wildlife, Residential Exchange Program, Planning Council, Conservation & Energy Efficiency and Associated Project Costs which have been shown separately for display purposes.

Bonneville makes an accounting adjustment to the production services component of FY 2019 Bonneville's audited actual obligations. This past year adjustment relates primarily to long-term obligation requirements consistent with Bonneville's FY 2019 Combined Schedules of Budgetary Resources and the GTAS FY 2019 Treasury reports for Bonneville.

<sup>3/</sup> See Interest Expense, Pension and Post-retirement Benefits and Capital Transfers section of this budget for a complete discussion of these cost estimates.

<sup>4/</sup> This budget has been prepared in accordance with PAYGO. Under PAYGO all Bonneville budget estimates are treated as mandatory and are not subject to the discretionary caps included in the Budget Control Act of 2011. These estimates support activities that are separate from discretionary activities and accounts. Thus, any changes to Bonneville estimates cannot be used to affect any other budget categories which have their own dollar caps. Because Bonneville's obligations are and will be incurred under pre-existing legislative authority, Bonneville is not subject to a "pay-as-you-go" test regarding its revision of current-law funding estimates.

CURRENT SERVICES

(in millions of dollars)

CAPITAL TRANSFERS

FISCAL YEAR

Amortization:  
 18 BPA Bonds  
 19 Reclamation Appropriations  
 20 BPA Appropriations  
 21 Corps Appropriations  
 22 Lower Snake River Comp Plan Amortization  
 23 **TOTAL CAPITAL TRANSFERS**

2019 Payment	2020 Payment	2021 Payment	2022 Payment	2023 Payment	2024 Payment	2025 Payment
506	351	402	371	330	314	301
3	0	0	0	0	0	0
0	0	0	0	0	0	0
224	0	0	0	0	0	0
0	0	0	0	0	0	0
<b>734</b>	<b>351</b>	<b>402</b>	<b>371</b>	<b>330</b>	<b>314</b>	<b>301</b>

24 **FULL-TIME EQUIVALENT (FTE)**

<b>2,727</b>	<b>3,000</b>	<b>3,000</b>	<b>3,000</b>	<b>3,000</b>	<b>3,000</b>	<b>3,000</b>
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**PROGRAM & FINANCING SUMMARY**

Current Services

(in millions of dollars)

Identification Code: 89-4045-0-3-271

	est.						
	2019	2020	2021	2022	2023	2024	2025
Program by activities:							
Operating expenses:							
0.01 Power Services	1,134	1,089	1,127	1,128	1,132	1,138	1,146
0.02 Residential Exchange Program	241	257	255	261	267	273	279
Associated Project Costs:							
0.05 Bureau of Reclamation	161	154	152	155	158	162	166
0.06 Corps of Engineers	253	253	253	258	264	270	276
0.07 Colville Settlement	20	23	23	24	24	25	25
0.19 U.S. Fish & Wildlife Service	27	30	30	31	32	33	33
0.20 Planning Council	11	12	12	12	12	13	13
0.21 Fish & Wildlife	228	249	249	255	260	266	272
0.23 Transmission Services	478	480	482	489	497	506	514
0.24 Conservation & Energy Efficiency	142	158	157	160	164	167	171
0.25 Interest	232	177	198	272	305	325	361
0.26 Pension and Health Benefits <sup>1/</sup>	41	38	40	41	42	43	44
0.91 <b>Total operating expenses</b> <sup>2/</sup>	<b>2,968</b>	<b>2,920</b>	<b>2,977</b>	<b>3,087</b>	<b>3,158</b>	<b>3,219</b>	<b>3,299</b>
Capital investment:							
1.01 Power Services	200	238	256	281	300	306	313
1.02 Transmission Services	192	469	474	468	507	525	487
1.04 Fish & Wildlife	22	47	47	43	43	40	40
1.05 Capital Equipment	10	22	22	22	22	21	20
1.06 Capitalized Bond Premiums	0	0	0	0	0	0	0
1.07 <b>Total Capital Investment</b> <sup>3/</sup>	<b>424</b>	<b>776</b>	<b>800</b>	<b>814</b>	<b>872</b>	<b>893</b>	<b>860</b>
2.01 Projects Funded in Advance	239	86	66	60	40	40	41
10.00 <b>Total obligations</b> <sup>4/</sup>	<b>3,631</b>	<b>3,782</b>	<b>3,843</b>	<b>3,962</b>	<b>4,070</b>	<b>4,152</b>	<b>4,200</b>

**These notes are an integral part of this table.**

<sup>1/</sup> See Interest Expense, Pension and Post-retirement Benefits and Capital Transfers section of this budget for a complete discussion of these cost estimates.

<sup>2/</sup> Assumes expense obligations, not accrued expenses.

Power Services doesn't include Fish & Wildlife, Residential Exchange Program, Planning Council, Conservation & Energy Efficiency and Associated Project Costs which have been shown separately for display purposes.

Bonneville makes an accounting adjustment to the production services component of FY 2019 Bonneville's audited actual obligations. This past year adjustment relates primarily to long-term obligation requirements consistent with Bonneville's FY 2019 Combined Schedules of Budgetary Resources and the GTAS FY 2019 Treasury reports for Bonneville.

<sup>3/</sup> Assumes capital obligations, not capital expenditures.

<sup>4/</sup> This FY 2021 budget includes capital and expense estimates based on final spending proposals from Bonneville's 2018 IPR process.

For purposes of this table, this FY 2021 budget reflects, for FY 2019, actual third party financing expense only for PFIA.

Capital funding levels reflect external factors such as the significant changes affecting West Coast power and transmission markets, along with planned infrastructure investments designed to address the long-term needs of the region.

Budget estimates included in this budget are subject to change due to rapidly changing economic and institutional conditions in the evolving electric utility industry.

Refer to 16 USC Chapters 12B, 12G, 12H, and Bonneville's other organic laws, including P.L. 100-371, Title III, Sec. 300, 102 Stat. 869, July 19, 1988, regarding Bonneville's ability to obligate funds.

**Program and Financing (continued)**

Current Services  
(in millions of dollars)  
est.

	2019	2020	2021	2022	2023	2024	2025
Financing:							
1000 Unobligated balance available, start of year. <sup>5/</sup>	13	12	10	0	0	0	0
1050 Unobligated balance available, end of year. <sup>5/</sup>	12	10	8	0	0	0	0
<b>1900 Budget authority (gross)</b>	<b>3,620</b>	<b>4,371</b>	<b>4,352</b>	<b>4,438</b>	<b>4,560</b>	<b>4,611</b>	<b>4,616</b>
Budget Authority:							
1400 Permanent Authority: Authority to borrow from Treasury (indefinite) <sup>6/</sup>	255	776	800	814	872	893	860
1600 Contract Authority	2,850						
1800 Spending authority from off-setting collections	3,657	3,946	3,954	3,994	4,017	4,032	4,057
1825 Portion applied to debt reduction	(506)	(351)	(402)	(371)	(330)	(314)	(301)
<b>1850 Spending authority from offsetting collections (adjusted)</b>	<b>515</b>	<b>3,595</b>	<b>3,552</b>	<b>3,624</b>	<b>3,687</b>	<b>3,718</b>	<b>3,756</b>
900 Total obligations	3,631	3,783	3,844	3,962	4,070	4,152	4,200
4110 Outlays (gross)	3,724	3,783	3,844	3,962	4,070	4,152	4,200
Adjustments to budget authority and outlays:							
Deductions for offsetting collections:							
4120 Federal funds	(54)	(90)	(90)	(90)	(90)	(90)	(90)
4121 Interest on Federal Securities	(9)						
4123 Non-Federal sources	(3,594)	(3,856)	(3,864)	(3,904)	(3,927)	(3,942)	(3,967)
4130 Total, offsetting collections	(3,657)	(3,946)	(3,954)	(3,994)	(4,017)	(4,032)	(4,057)
<b>4160 Budget authority (net)</b>	<b>(4)</b>	<b>425</b>	<b>398</b>	<b>443</b>	<b>543</b>	<b>579</b>	<b>559</b>
<b>4170 Outlays (net)<sup>7/8/</sup></b>	<b>67</b>	<b>(163)</b>	<b>(110)</b>	<b>(33)</b>	<b>53</b>	<b>120</b>	<b>143</b>

**These notes are an integral part of this table.**

<sup>5/</sup> Reflects estimated cost for radio spectrum fund.

<sup>6/</sup> The Permanent Authority: Authority to borrow (indefinite) from the U.S. Treasury amounts reflect both Bonneville's capital program financing needs and either the use of, or creation of, deferred borrowing. Deferred borrowing is created when, as a cash and debt management decision, Bonneville uses cash from revenues to liquidate capital obligations in lieu of borrowing at that time from the U.S. Treasury. This temporary use of cash on hand instead of borrowed funds creates the ability in future years to borrow money, when fiscally prudent. The FY 1989 Energy and Water Development Appropriations Act (P.L. 100-371 Of 7/19/88) confirmed that Bonneville has authority to incur obligations in excess of U.S. Treasury borrowing authority and cash in the BPA fund. Total includes BPA's self-financing activities and funds for Radio Spectrum Relocation. In addition, BPA has negotiated with the U.S. Treasury access to a \$750 million short term note as part of the \$7.7 billion borrowing authority.

<sup>7/</sup> Net Outlay estimates are based on current cost savings to date and anticipated cash management goals. They are expected to follow anticipated management decisions throughout the rate period that, along with actual market conditions, will impact revenues and expenses. Actual Net Outlays are volatile and are reported in Report on Budget Execution and Budgetary Resources (SF-133). Actual Net Outlays could differ from estimates due to changing market conditions, streamflow variability, continued restructuring of the electric industry, and other reasons.

Revenues, included in the Net Outlay formulation, are calculated consistent with cash management goals and assume a combination of adjustments. Assumed adjustments include the use of a combination of tools, including upcoming rate adjustment mechanisms, a net revenue risk adjustment, debt service refinancing strategies and/or short-term financial tools to manage net revenues and cash. Some of these potential tools will reduce costs rather than generate revenue, causing the same Net Outlay result. Adjustments for depreciation and 4(h)(10)(C) credits of the Northwest Power Act are also assumed.

This budget has been prepared in accordance with PAYGO. Under PAYGO all Bonneville budget estimates are treated as mandatory and are not subject to the discretionary caps included in the Budget Control Act of 2011. These estimates support activities that are separate from discretionary activities and accounts.

Thus, any changes to Bonneville estimates cannot be used to affect any other budget categories which have their own dollar caps. Because Bonneville's obligations are and will be incurred under pre-existing legislative authority, Bonneville is not subject to a "pay-as-you-go" test regarding its revision of current-law funding estimates.

<sup>8/</sup> FY 2019 Net Outlays are calculated using Bonneville's audited actual revenue. FYs 2020 to 2025 Net Outlays are based on 2018 final IPR assumptions and an escalation factor from using the FY 2018 White Book Loads and Resources Report



**BONNEVILLE POWER ADMINISTRATION  
BPA STATUS of U.S. TREASURY BORROWING  
CURRENT SERVICES**

BP-4A

	Fiscal Year							
	2019				2020			
	Net Capital		Net Capital		Net Capital		Net Capital	
	Net Capital	Obs Subject	Net Capital	Bonds Out-	Net Capital	Obs Subject	Net Capital	Bonds Out-
	Obs	to BA	Expend.	Standing	Obs	to BA	Expend.	Standing
<b>Start-of-Year: Total</b>	4,305	3,763	5,204	5,531	4,223	3,681	5,122	5,280
<b>Plus: Annual Increase</b>								
Cum.-Annual Treasury Borrowing	424	424	424	255	776	776	776	776
Treasury Borrowing (Cash)								
<b>Less:</b>								
BPA Bond Amortization	506	506	506	506	351	351	351	351
<b>Net Increase/(Decrease):</b>	(82)	(82)	(82)	(251)	425	425	425	425
Cum.-End-of-Year: Total	4,223	3,681	5,122	5,280	4,648	4,106	5,547	5,705
<b>Total Remaining Treasury Borrowing Amount</b>				2,420				1,995
<b>Total Legislated Treasury Borrowing Amount</b>				7,700				7,700

**These notes are an integral part of this table.**

In any given year, Bonneville may issue lower principal amount of bonds to the U.S. Treasury than forecast depending on net revenues, borrowing costs, and other cash management factors. In such cases, Bonneville accumulates a deferred borrowing balance that it accesses as necessary in the future.

Capital funding levels reflect external factors such as the significant changes affecting West Coast power and transmission markets, along with planned infrastructure investments designed to address the long-term needs of the region.

In this FY 2021 budget, Bonneville "bond(s)" refers to all bonds issued by Bonneville to and advances received from the U.S. Treasury. This reference is consistent with section 13 (a) of the Transmission Act, which defines Bonneville bonds as all bonds, notes, and other evidences of indebtedness issued and sold by Bonneville to the U.S. Treasury.

As in the past, Bonneville may pursue future restructuring of total debt as opportunities arise.

Budget estimates included in this budget are subject to change due to rapidly changing economic and institutional conditions in the evolving electric utility industry.

Bonneville reserve financing of \$15 million annually was part of TS capital-PFIA for FYs 2018-2019.

Cumulative advance amortization payments as of the end of FY 2019 are \$5,791 million.

Total includes BPA's self-financing activities and funds for Radio Spectrum Relocation. In addition, BPA has negotiated with the U.S. Treasury access to a \$750 million short term note as part of the \$7.7 billion borrowing authority.

**BONNEVILLE POWER ADMINISTRATION**  
**BPA STATUS of U.S. TREASURY BORROWING**  
**CURRENT SERVICES**  
(in millions of dollars)

BP-4B

	2021				2022			
	Net Capital		Net Capital	Bonds Out-	Net Capital		Net Capital	Bonds Out-
	Obs	Subject to BA			Obs	Subject to BA		
<b>Start-of-Year: Total</b>	4,648	4,106	5,547	5,705	5,046	4,504	5,945	6,103
<b>Plus: Annual Increase</b>								
Cum.-Annual Treasury Borrowing	800	800	800	800	814	814	814	814
Treasury Borrowing (Cash)								
<b>Less:</b>								
Total BPA Bond Amortization	402	402	402	402	371	371	371	371
<b>Net Increase/(Decrease):</b>								
Total	398	398	398	398	443	443	443	443
Cum.-End-of-Year: Total	5,046	4,504	5,945	6,103	5,490	4,948	6,389	6,547
<b>Total Remaining Treasury Borrowing Amount</b>				1,597				1,153
<b>Total Legislated Treasury Borrowing Amount</b>				7,700				7,700

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Capital funding levels reflect external factors such as the significant changes affecting West Coast power and transmission markets, along with planned infrastructure investments designed to address the long-term needs of the region.

In this FY 2021 budget, Bonneville "bond(s)" refers to all bonds issued by Bonneville to and advances received from the U.S. Treasury. This reference is consistent with section 13 (a) of the Transmission Act, which defines Bonneville bonds as all bonds, notes, and other evidences of indebtednesses issued and sold by Bonneville to the U.S. Treasury.

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Budget estimates included in this budget are subject to change due to rapidly changing economic and institutional conditions in the evolving electric utility industry.

Bonneville reserve financing of \$15 million annually was part of TS capital-PFIA for FYs 2018-2019.

Cumulative advance amortization payments as of the end of FY 2019 are \$5,791 million.

Total includes BPA's self-financing activities and funds for Radio Spectrum Relocation. In addition, BPA has negotiated with the U.S. Treasury access to a \$750 million short term note as part of the \$7.7 billion borrowing authority.

**BONNEVILLE POWER ADMINISTRATION**  
**BPA STATUS of U.S. TREASURY BORROWING**  
**CURRENT SERVICES**  
(in millions of dollars)

BP-4C

Fiscal Year

	2023				2024			
	Net Capital		Net Bonds		Net Capital		Net Bonds	
	Net Capital	Obs Subject	Net Capital	Bonds Out-	Net Capital	Obs Subject	Net Capital	Bonds Out-
	Obs	to BA	Expend.	Standing	Obs	to BA	Expend.	Standing
<b>Start-of-Year: Total</b>	5,490	4,948	6,389	6,547	6,032	5,490	6,931	7,089
<b>Plus: Annual Increase</b>								
Cum.-Annual Treasury Borrowing	872	872	872	872	893	893	893	893
Treasury Borrowing (Cash)								
<b>Less:</b>								
Total BPA Bond Amortization	330	330	330	330	314	314	314	314
<b>Net Increase/(Decrease):</b>								
Total	543	543	543	543	579	579	579	579
Cum.-End-of-Year: Total	6,032	5,490	6,931	7,089	6,611	6,069	7,510	7,668
<b>Total Remaining Treasury Borrowing Amount</b>				611				32
<b>Total Legislated Treasury Borrowing Amount</b>				7,700				7,700

**These notes are an integral part of this table.**

In any given year, Bonneville may issue lower principal amount of bonds to the U.S. Treasury than forecast depending on net revenues, borrowing costs, and other cash management factors. In such cases, Bonneville accumulates a deferred borrowing balance that it accesses as necessary in the future.

Capital funding levels reflect external factors such as the significant changes affecting West Coast power and transmission markets, along with planned infrastructure investments designed to address the long-term needs of the region.

In this FY 2021 budget, Bonneville "bond(s)" refers to all bonds issued by Bonneville to and advances received from the U.S. Treasury. This reference is consistent with section 13 (a) of the Transmission Act, which defines Bonneville bonds as all bonds, notes, and other evidences of indebtednesses issued and sold by Bonneville to the U.S. Treasury.

As in the past, Bonneville may pursue future restructuring of total debt as opportunities arise.

Budget estimates included in this budget are subject to change due to rapidly changing economic and institutional conditions in the evolving electric utility industry.

Bonneville reserve financing of \$15 million annually was part of TS capital-PFIA for FYs 2018-2019.

Cumulative advance amortization payments as of the end of FY 2019 are \$5,791 million.

Total includes BPA's self-financing activities and funds for Radio Spectrum Relocation. In addition, BPA has negotiated with the U.S. Treasury access to a \$750 million short term note as part of the \$7.7 billion borrowing authority.

**BONNEVILLE POWER ADMINISTRATION  
BPA STATUS of U.S. TREASURY BORROWING  
CURRENT SERVICES**

(in millions of dollars)

BP-4D

	Fiscal Year			
	<b>2025</b>			
	Net Capital		Net Capital	
	Net Capital Obs	Obs Subject to BA	Net Capital Expend.	Bonds Out- Standing
<b>Start-of-Year: Total</b>	6,611	6,069	7,510	7,668
<b>Plus: Annual Increase</b>				
Cum.-Annual Treasury Borrowing	860	860	860	860
Treasury Borrowing (Cash)				
<b>Less:</b>				
Total BPA Bond Amortization	301	301	301	301
<b>Net Increase/(Decrease):</b>				
Total	559	559	559	559
Cum.-End-of-Year: Total	7,171	6,629	8,070	8,228
<b>Total Remaining Treasury Borrowing Amount</b>				(528)
<b>Total Legislated Treasury Borrowing Amount</b>				7,700

**These notes are an integral part of this table.**

In any given year, Bonneville may issue lower principal amount of bonds to the U.S. Treasury than forecast depending on net revenues, borrowing costs, and other cash management factors. In such cases, Bonneville accumulates a deferred borrowing balance that it accesses as necessary in the future.

Capital funding levels reflect external factors such as the significant changes affecting West Coast power and transmission markets, along with planned infrastructure investments designed to address the long-term needs of the region.

In this FY 2021 budget, Bonneville "bond(s)" refers to all bonds issued by Bonneville to and advances received from the U.S. Treasury. This reference is consistent with section 13 (a) of the Transmission Act, which defines Bonneville bonds as all bonds, notes, and other evidences of indebtednesses issued and sold by Bonneville to the U.S. Treasury.

As in the past, Bonneville may pursue future restructuring of total debt as opportunities arise.

Budget estimates included in this budget are subject to change due to rapidly changing economic and institutional conditions in the evolving electric utility industry.

Bonneville reserve financing of \$15 million annually was part of TS capital-PFIA for FYs 2018-2019.

Cumulative advance amortization payments as of the end of FY 2019 are \$5,791 million.

Total includes BPA's self-financing activities and funds for Radio Spectrum Relocation. In addition, BPA has negotiated with the U.S. Treasury access to a \$750 million short term note as part of the \$7.7 billion borrowing authority.

**BONNEVILLE POWER ADMINISTRATION  
POTENTIAL THIRD PARTY FINANCING TRANSPARENCY**  
(in millions of dollars)

BP-5

	Fiscal Year						
	2019	2020	2021	2022	2023	2024	2025
<b>Transmission Services - Capital</b>							
Main Grid	4	3	27	25	33	46	39
Area & Customer Services	38	80	91	74	69	56	66
Upgrades & Additions	29	56	49	69	104	121	74
System Replacements	121	330	307	300	301	303	308
Projects Funded in Advance	239	86	66	60	40	40	41
<b>Total, Transmission Services - Capital</b>	<b>431</b>	<b>555</b>	<b>540</b>	<b>528</b>	<b>547</b>	<b>565</b>	<b>528</b>

**Associated Project Costs - Capital**

Requirement	2019	2020	2021	2022	2023	2024	2025
Associated Project Costs	200	238	256	281	300	306	313
Projects Funded in Advance <sup>1/</sup>	0	0	0	0	0	0	0
<b>Total, Associated Project Costs - Capital</b>	<b>200</b>	<b>238</b>	<b>256</b>	<b>281</b>	<b>300</b>	<b>306</b>	<b>313</b>

**Federal and Non-Federal Funding**

Source	2019	2020	2021	2022	2023	2024	2025
Projects Funded in Advance	239	86	66	60	40	40	41
U.S. Treasury Borrowing Authority	392	707	730	749	807	831	800

**Scenario**

Scenario	2019	2020	2021	2022	2023	2024	2025
Projects Funded in Advance <sup>1/</sup>	0	0	0	0	0	0	0
Third Party Financing	48	117	119	117	127	131	122
Alternate Treasury Borrowing Authority	NA	590	612	632	680	700	678

**These notes are an integral part of this table.**

<sup>1/</sup> In this instance, Projects Funded in Advance represents prepayment of Power customers' bills reimbursed by future credits and third party non-federal financing for Conservation initiatives.

The table above shows both the potential use of U.S. Treasury borrowing authority for transmission capital projects based on this FY 2021 budget and the use adjusted for potential third-party financing to fund appropriate capital expenditures when feasible in lieu of U.S. Treasury borrowing. Estimates included in this FY 2021 budget are uncertain and may change due to revised capital investment plans, changing economic conditions, and an evolving financial market environment. The estimates of third-party financing included in the table show a reduction in the use of U.S. Treasury borrowing and do not reflect the actual notional third party financing commitment Bonneville may enter into in that particular year. The difference of reduction in use of U.S. Treasury borrowing and the actual notional third party financing commitment is primarily due to the difference in the timing of financing transactions between U.S. Treasury and third-party financing for capital projects with multi-year construction schedules.

Bonneville's Third Party Financing for Transmission Services consists primarily of lease-purchase agreements, which are capitalized obligations that enable Bonneville to acquire the use of transmission facilities over time. Bonneville also undertakes the construction and installation of facilities from funds that customers advance to Bonneville for construction of BPA-owned facilities that assist the customers in obtaining necessary transmission service from Bonneville. These customers receive monetary payment credits in bills for transmission services from Bonneville up to the amount of funds advanced to Bonneville, plus interest.

Bonneville's historical Third Party Financing amounts may vary over time due to re-assignment of certain lease-purchase agreements to Treasury Financing.

**Bonneville Status of U.S. Treasury Borrowing with Potential Third Party Financing & PFIA Scenario**

With the potential use of third party financing assumed in the scenario above, Bonneville's total remaining U.S. Treasury Borrowing Amount would be extended to the following amounts. See BP-4 BPA Status of Treasury Borrowing- Current Services.

	Fiscal Year						
	2019	2020	2021	2022	2023	2024	2025
<b>Start-of-Year: Total Bonds Outstanding</b>	<b>5,531</b>	<b>5,280</b>	<b>5,588</b>	<b>5,867</b>	<b>6,194</b>	<b>6,610</b>	<b>7,057</b>
Plus:							
U.S. Treasury Borrowing (Cash)	255	776	800	814	872	893	860
Less:							
<b>Potential Third Party Financing &amp; PFIA</b>	<b>48</b>	<b>117</b>	<b>119</b>	<b>117</b>	<b>127</b>	<b>131</b>	<b>122</b>
BPA Bond Amortization	506	351	402	371	330	314	301
<b>Net Increase/(Decrease) Bonds Outstanding:</b>	<b>(251)</b>	<b>308</b>	<b>279</b>	<b>326</b>	<b>416</b>	<b>448</b>	<b>438</b>
<b>Cum.-End-of-Year: Total</b>	<b>5,280</b>	<b>5,588</b>	<b>5,867</b>	<b>6,194</b>	<b>6,610</b>	<b>7,057</b>	<b>7,495</b>
<b>Total Remaining U.S. Treasury Borrowing Amount</b>	<b>2,420</b>	<b>2,112</b>	<b>1,833</b>	<b>1,506</b>	<b>1,090</b>	<b>643</b>	<b>205</b>
Total Legislated U.S. Treasury Borrowing Amount	7,700	7,700	7,700	7,700	7,700	7,700	7,700

**U.S. TREASURY PAYMENTS**

(in millions of dollars)

	FISCAL YEAR						
	2019	2020	2021	2022	2023	2024	2025
<b>A. INTEREST ON BONDS &amp; APPROPRIATIONS</b>							
<b>Bonneville Bond Interest</b>							
1 Bonneville Bond Interest (net)	147	120	139	203	232	261	296
2 AFUDC <sup>1/</sup>	32	34	34	34	33	32	32
<b>Appropriations Interest</b>							
3 Bonneville	0	0	0	0	0	0	0
4 Corps of Engineers <sup>2/</sup>	51	55	57	58	59	61	64
5 Lower Snake River Comp. Plan	0	0	0	0	0	0	0
6 Bureau of Reclamation <sup>3/</sup>	1	1	1	1	1	1	1
7 Bond Premiums paid/Discounts (not capitalized)	0	1	1	9	12	2	1
<b>8 Total Bond and Approp. Interest</b>	<b>232</b>	<b>210</b>	<b>232</b>	<b>307</b>	<b>338</b>	<b>357</b>	<b>393</b>
<b>B. ASSOCIATED PROJECT COST</b>							
9 Bureau of Reclamation Irrigation Assistance	56	24	15	16	13	15	14
10 Bureau of Rec. O & M <sup>4/</sup>	0	0	0	0	0	0	0
11 Corps of Eng. O & M <sup>4/</sup>	1	0	0	0	0	0	0
12 L. Snake River Comp. Plan O & M <sup>4/</sup>	0	0	0	0	0	0	0
<b>13 Total Assoc. Project Costs</b>	<b>57</b>	<b>24</b>	<b>15</b>	<b>16</b>	<b>13</b>	<b>15</b>	<b>14</b>
<b>C. CAPITAL TRANSFERS</b>							
<b>Amortization</b>							
14 Bonneville Bonds <sup>6/</sup>	506	351	402	371	330	314	301
15 Bureau of Reclamation Appropriations	3	0	0	0	0	0	0
16 Corps of Engineers Appropriations	224	0	0	0	0	0	0
17 Lower Snake River Comp. Plan	0	0	0	0	0	0	0
18 Bonneville Appropriations	0	0	0	0	0	0	0
<b>19 Total Capital Transfers <sup>8/</sup></b>	<b>734</b>	<b>351</b>	<b>402</b>	<b>371</b>	<b>330</b>	<b>314</b>	<b>301</b>
<b>D. OTHER PAYMENTS</b>							
20 Unfunded Post-Retirement Liability <sup>5/</sup>	41	38	40	41	42	43	44
<b>21 TOTAL TREASURY PAYMENTS</b>	<b>1,064</b>	<b>624</b>	<b>689</b>	<b>735</b>	<b>723</b>	<b>728</b>	<b>751</b>

**These notes are an integral part of this table.**

<sup>1/</sup> This interest cost is capitalized and included in BPA's Transmission System Development, System Replacements, and Associated Projects Capital programs. AFUDC is financed through the sale of bonds.

<sup>2/</sup> Includes interest on construction funding for Corp of Engineers (Corps) fish bypass facilities at Corps dams in the Columbia River Basin, including Lower Monumental, Ice Harbor, and The Dalles.

<sup>3/</sup> Includes payments paid by Reclamation to the U.S. Treasury on behalf of Bonneville.

<sup>4/</sup> Costs for power O&M is funded directly by Bonneville as follows (in millions):

	FISCAL YEAR						
	2019	2020	2021	2022	2023	2024	2025
Bureau of Reclamation	161	154	152	155	158	162	166
Corps of Engineers	253	253	253	258	264	270	276
Subtotal Bureau and Corps	414	406	404	413	422	432	441
Lower Snake River Comp. Plan	27	30	30	31	32	33	33
<b>Total</b>	<b>441</b>	<b>437</b>	<b>435</b>	<b>444</b>	<b>454</b>	<b>464</b>	<b>475</b>

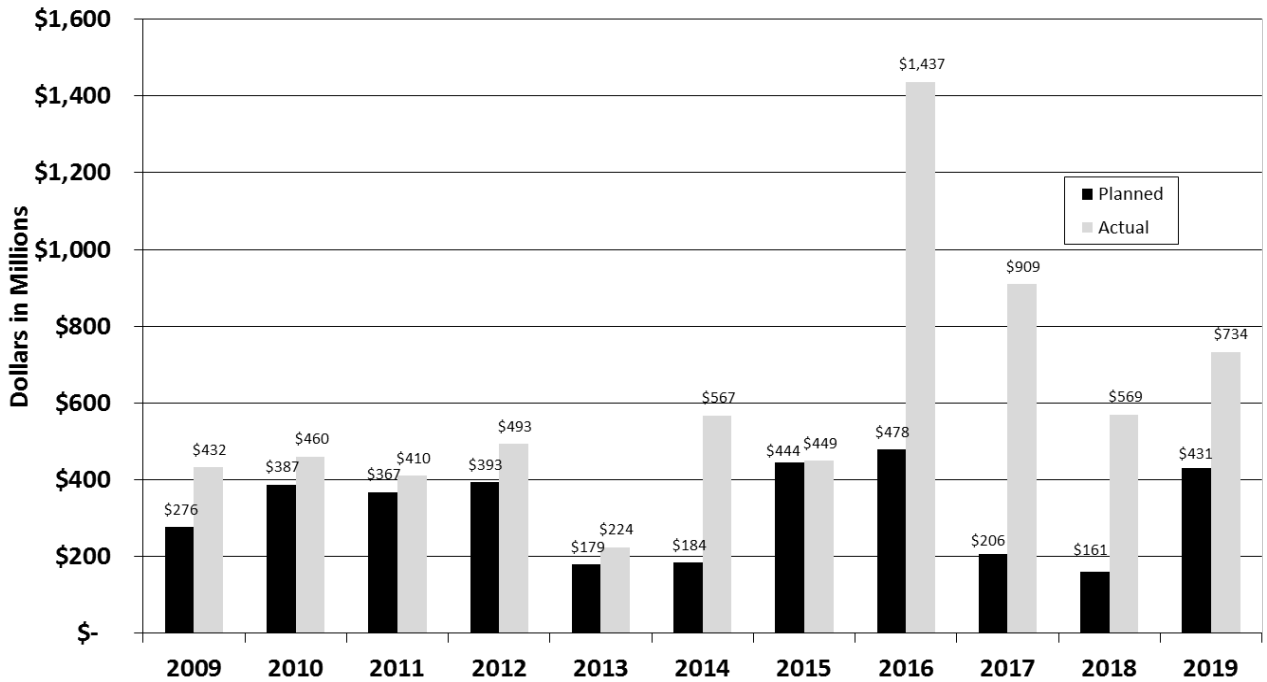
<sup>5/</sup> See Interest Expense, Pension and Post-retirement Benefits and Capital Transfers section of this budget for a complete discussion of these cost estimates.

<sup>6/</sup> In this FY 2021 budget, Bonneville "bond(s)" refers to all bonds issued by Bonneville to and advances received from the U.S. Treasury. This reference is consistent with section 13 (a) of the Transmission Act, which defines Bonneville bonds as all bonds, notes, and other evidences of indebtedness issued and sold by Bonneville to the U.S. Treasury.

Does not include Treasury bond premiums on refinanced Treasury bonds.

<sup>8/</sup> FY 2019 data reflects actual capital transfer.

## Status of U.S. Treasury Principal Repayment



### Chart Notes

<sup>1/</sup> This chart displays principal repayment only.

<sup>2/</sup> U.S. Treasury payment outyear estimates for planned amortization of principal are based on rate case estimates when available and are planned amortization for future rate case periods. These estimates may change due to revised capital investment plans, actual U.S. Treasury borrowing, and advanced amortization payments. Bonneville's aggregate FY 2019 U.S. Treasury payment was \$1,064 million, composed of \$734 million in principal repayment (including \$228 million in early retirement of higher interest rate U.S. Treasury debt), \$232 million in interest, \$56 million in irrigation assistance payments, and \$41 million in pension and post-retirement benefits.

<sup>3/</sup> FYs 2002-2012 payments include portions of advance amortization amounts consistent with Bonneville's capital strategy plan and the Bonneville /Energy Northwest debt optimization program.

<sup>4/</sup> Advance amortization due to sale of transmission facilities includes \$12.7 million in FY 2003, \$5.3 million in FY 2006, \$2.0 million in FY 2011, \$0.4 million in FY 2013 and \$0.4 million in FY 2014, and \$0.6 million in FY 2017.

<sup>5/</sup> The cumulative amount of actual advance amortization payments as of the end of FY 2019 is \$5,791 million.

<sup>6/</sup> FYs 2014-2019 include advance amortization under the Regional Cooperation Debt initiative with Energy Northwest (EN) under which EN extended maturities on Bonneville-backed debt which enabled the early amortization of higher cost appropriations.

**OBJECT CLASSIFICATION STATEMENT**

(in millions of dollars)

**ESTIMATES**

	<b>2019</b>	<b>2020</b>	<b>2021</b>
11.1 Full-time permanent	261	272	276
11.3 Other than full-time permanent	1	1	1
11.5 Other personnel compensation	80	83	85
11.9 <b>Total personnel compensation</b>	<b>342</b>	<b>356</b>	<b>362</b>
12.1 Civilian personnel benefits	159	166	168
13.0 Benefits for former personnel	-	-	-
21.0 Travel and transportation of persons	5	5	5
22.0 Transportation of things	1	1	1
23.1 Rental payments to GSA	0	0	0
23.2 Rents, other	37	39	39
23.3 Communication, utilities & misc. charges	11	11	12
25.1 Consulting Services	98	102	104
25.2 Other Services	2,297	2,392	2,431
25.5 R & D Contracts	4	5	5
26.0 Supplies and materials	35	36	37
31.0 Equipment	176	183	186
32.0 Lands and structures	117	122	124
41.0 Grants, subsidies, contributions	48	50	51
43.0 Interest and dividends	301	313	318
99.0 <b>Total obligations</b>	<b>3,631</b>	<b>3,782</b>	<b>3,843</b>



**Estimate of Receipts**  
(in millions of dollars)

	Fiscal Year						
	2019	2020	2021	2022	2023	2024	2025
Reclamation Interest	1	1	1	1	1	1	1
Reclamation Amortization	3	0	0	0	0	0	0
Reclamation O&M	0	0	0	0	0	0	0
Reclamation Irrig. Assist.	56	24	15	16	13	15	14
Revenues Collected by Reclamation Distributed in Treasury Account (credit)	-15	-7	-7	-7	-7	-7	-7
Colville Settlement (credit)	-5	-5	-5	-5	-5	-5	-5
<b>Total 1/ Reclamation Fund</b>	<b>40</b>	<b>13</b>	<b>4</b>	<b>5</b>	<b>2</b>	<b>4</b>	<b>3</b>
Corps O&M							
CSRS	41	38	40	41	42	43	44
<b>Total 2/ Repayments on miscellaneous costs</b>	<b>41</b>	<b>38</b>	<b>40</b>	<b>41</b>	<b>42</b>	<b>43</b>	<b>44</b>

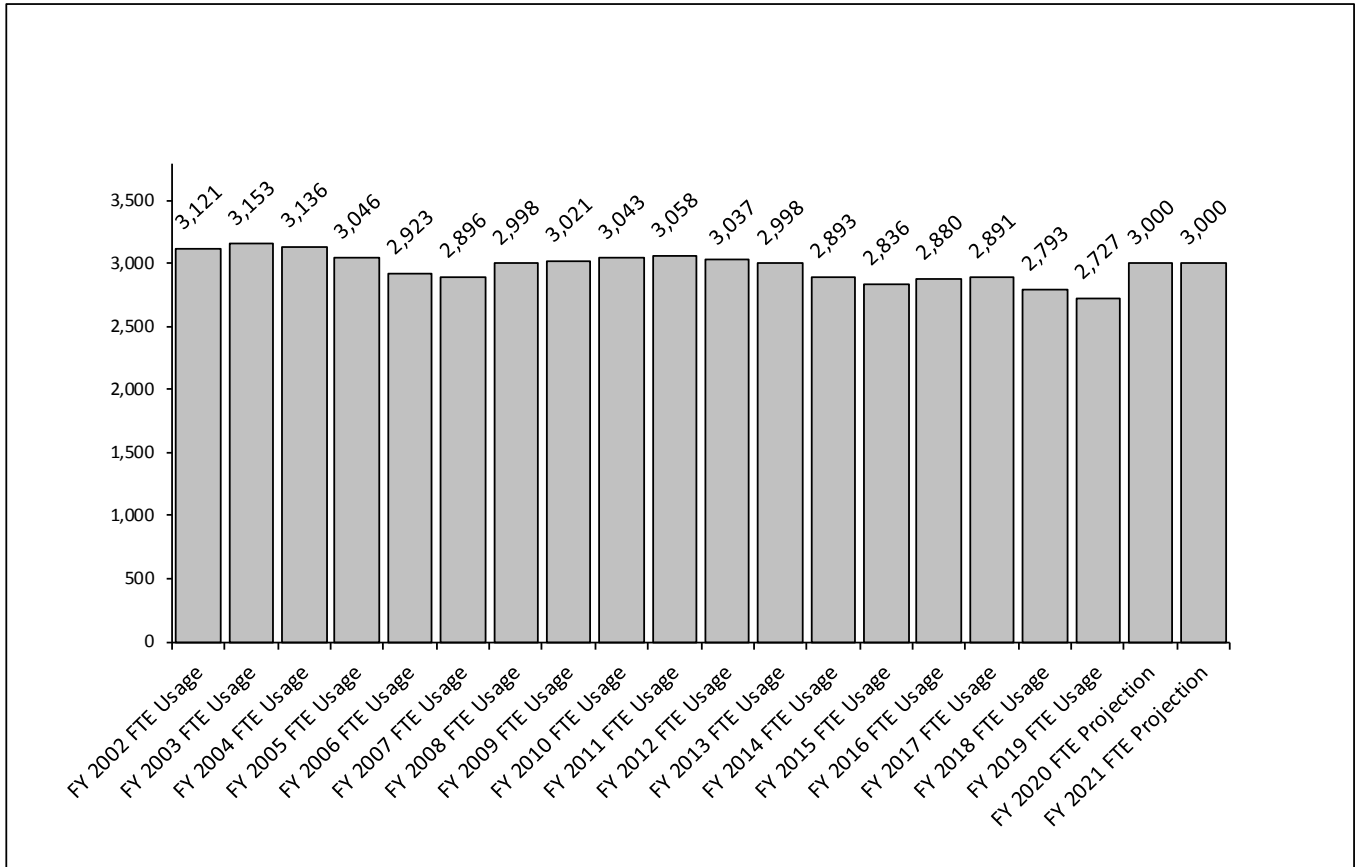
1/ Includes amortization of appropriations and irrigation assistance, and interest costs for Reclamation. The cost of power O&M for Reclamation is no longer included in Proprietary Receipts due to Direct Funding by Bonneville. Represents transfer to Account #895000.26

2/ The costs of power O&M for the Corps and Lower Snake River Comp. Plan are no longer included in Proprietary Receipts due to Direct Funding by Bonneville. Represents transfers to Account #892889, Repayments on misc. recoverable costs, not otherwise classified. Costs for power O&M is funded directly by Bonneville as follows (in millions)

	2019	2020	2021	2022	2023	2024	2025
Bureau of Reclamation	161	154	152	155	158	162	166
Corps of Engineers	253	253	253	258	264	270	276
Lower Snake River Comp. Plan	27	30	30	31	32	33	33
<b>Total</b>	<b>441</b>	<b>437</b>	<b>435</b>	<b>444</b>	<b>454</b>	<b>464</b>	<b>475</b>

See Interest Expense, Pension and Post-retirement Benefits and Capital Transfers section of this budget for a complete discussion of these cost estimates.

## BONNEVILLE FTE



**These notes are an integral part of this chart.**

1. Actual FTE data is consistent with DOE personnel reports.
2. FTE outyear data are estimates and may change. Bonneville is facing a dynamic and changing transmission marketplace and operations while, at the same time, many of its employees are eligible to retire in the near future. It is important that Bonneville continue to attract and retain skilled individuals to meet the growing demands of a competitive and rapidly changing industry. Accordingly, FTE estimates may need to be adjusted in the future.
3. As of October 25, 2019 DOE HR staff has reported FY 2019 BPA's FTE usage at 2,727.

**Total Cost of BPA Fish & Wildlife Actions (\$ in millions)**

COST ELEMENT	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
<b>CAPITAL INVESTMENTS <sup>1/</sup></b>											
BPA FISH AND WILDLIFE	27.4	40.0	90.2	57.5	52.1	37.4	21.4	16.0	5.4	30.7	22.3
BPA SOFTWARE DEVELOPMENT COSTS	0.6	1.2	0.8	0.4	0.0	0.1	1.4	1.2	1.4	0.8	0.0
ASSOCIATED PROJECTS (FEDERAL HYDRO)	135.7	56.4	103.0	114.5	103.6	101.7	81.4	34.1	58.9	51.8	55.5
<b>TOTAL CAPITAL INVESTMENTS</b>	<b>163.7</b>	<b>97.6</b>	<b>193.9</b>	<b>172.3</b>	<b>155.7</b>	<b>139.2</b>	<b>104.1</b>	<b>51.4</b>	<b>65.7</b>	<b>83.2</b>	<b>77.9</b>
<b>PROGRAM EXPENSES</b>											
<b>BPA DIRECT FISH AND WILDLIFE PROGRAM</b>	<b>177.9</b>	<b>199.6</b>	<b>221.1</b>	<b>248.9</b>	<b>239.0</b>	<b>231.8</b>	<b>258.2</b>	<b>258.1</b>	<b>254.7</b>	<b>258.7</b>	<b>240.4</b>
FISH & WILDLIFE SOFTWARE EXPENSE COSTS	0.0	0.0	0.0	0.0	0.2	0.3	0.1	0.0	0.0	0.1	0.0
SUPPLEMENTAL MITIGATION PROGRAM EXPENSES <sup>2/</sup>	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
<b>REIMBURSABLE/DIRECT-FUNDED PROJECTS <sup>3/</sup></b>											
O & M LOWER SNAKE RIVER HATCHERIES	20.8	23.3	24.5	22.0	28.7	31.0	30.9	28.6	26.0	31.4	26.7
O & M CORPS OF ENGINEERS	34.3	36.5	40.3	41.1	39.2	47.8	46.4	48.2	46.8	47.1	48.9
O & M BUREAU OF RECLAMATION	4.5	5.2	5.0	5.3	5.6	6.6	2.6	6.0	7.0	5.2	8.7
NW POWER AND CONSERVATION COUNCIL ALLOCATED @ 50%	4.7	4.7	4.5	4.6	5.0	4.9	4.9	5.4	5.4	5.5	5.6
SUBTOTAL (REIMBURSABLE/DIRECT-FUNDED)	64.3	69.7	74.3	73.0	78.5	90.3	84.9	88.2	85.2	89.2	89.9
<b>TOTAL OPERATING EXPENSES</b>	<b>242.1</b>	<b>269.3</b>	<b>295.3</b>	<b>321.9</b>	<b>317.70</b>	<b>322.40</b>	<b>343.17</b>	<b>346.34</b>	<b>339.90</b>	<b>347.97</b>	<b>330.30</b>
<b>PROGRAM RELATED FIXED EXPENSES <sup>4/</sup></b>											
INTEREST EXPENSE	78.7	80.5	79.2	80.6	89.1	83.4	89.2	85.6	58.6	41.0	39.7
AMORTIZATION EXPENSE	24.6	25.0	28.3	30.2	35.7	38.7	41.3	42.5	42.5	43.4	45.1
DEPRECIATION EXPENSE	16.7	18.0	19.6	20.7	18.6	19.2	20.1	20.1	20.3	20.8	21.0
<b>TOTAL FIXED EXPENSES</b>	<b>120.0</b>	<b>123.5</b>	<b>127.2</b>	<b>131.5</b>	<b>143.4</b>	<b>141.3</b>	<b>150.6</b>	<b>148.2</b>	<b>121.4</b>	<b>105.1</b>	<b>105.8</b>
<b>GRAND TOTAL PROGRAM EXPENSES</b>	<b>362.1</b>	<b>392.8</b>	<b>422.5</b>	<b>453.4</b>	<b>461.1</b>	<b>463.7</b>	<b>493.7</b>	<b>494.6</b>	<b>461.3</b>	<b>453.0</b>	<b>436.1</b>
<b>FORGONE REVENUES AND POWER PURCHASES</b>											
FOREGONE REVENUES	142.8	99.4	156.7	152.2	135.5	122.7	195.8	76.6	9.6	2.9	174.4
BPA POWER PURCH. FOR FISH ENHANCEMENT	240.3	310.1	70.7	38.5	85.8	196.2	67.5	50.3	(20.5)	24.3	177.6
<b>TOTAL FOREGONE REVENUES AND POWER PURCHASES</b>	<b>383.1</b>	<b>409.5</b>	<b>227.4</b>	<b>190.7</b>	<b>221.3</b>	<b>318.9</b>	<b>263.3</b>	<b>126.9</b>	<b>(10.9)</b>	<b>27.2</b>	<b>352.0</b>
<b>TOTAL PROGRAM EXPENSES, FOREGONE REVENUES, &amp; POWER PURCHASES</b>	<b>745.3</b>	<b>802.3</b>	<b>649.9</b>	<b>644.1</b>	<b>682.4</b>	<b>782.6</b>	<b>757.0</b>	<b>621.5</b>	<b>450.4</b>	<b>480.2</b>	<b>788.1</b>
<b>CREDITS</b>											
4(h)(10)(C)	(99.5)	(122.8)	(85.3)	(77.0)	(84.1)	(103.9)	(77.7)	(72.6)	(53.7)	(70.2)	(98.2)
<b>TOTAL CREDITS</b>	<b>(99.5)</b>	<b>(122.8)</b>	<b>(85.3)</b>	<b>(77.0)</b>	<b>(84.1)</b>	<b>(103.9)</b>	<b>(77.7)</b>	<b>(72.6)</b>	<b>(53.7)</b>	<b>(70.2)</b>	<b>(98.2)</b>

This information has been made publicly available by BPA. The figures shown are consistent with audited actuals that contain Agency approved financial information, except for forgone revenues and power purchases which are estimates and do not contain Agency approved financial information

1/ Capital Investments include both BPA's direct Fish and Wildlife Program capital investments, funded by BPA's Treasury borrowing, and "Associated Projects", which include capital investments at Corps of Engineers' and Bureau of Reclamation projects, funded by appropriations and repaid by BPA. The annual expenses associated with these investments are included in "Program-Related Fixed Expenses", below.

2/ Includes High Priority and Action Plan Expenses and other supplemental programs.

3/ "Reimbursable/Direct-Funded Projects" includes the portion of costs BPA pays to or on behalf of other entities that is determined to be for fish and wildlife purposes.

4/ "Fixed Expenses" include depreciation, amortization, and interest on investments on the Corps and Bureau's projects, and amortization and interest on the investments associated with BPA's direct Fish and Wildlife Program.