

IPR/CIR Details



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1.	BPA Overview.....	6
1.1	Key Strategic Initiatives.....	7
1.1.1	Safety & Occupational Health Key Strategic Initiative	8
1.1.2	Workforce Key Strategic Initiative.....	9
1.1.3	Asset Management Key Strategic Initiative	10
1.1.4	Long-Term Financial & Rates Strategy Key Strategic Initiative.....	11
1.1.5	Commercial Operations Key Strategic Initiative	13
1.1.6	Business Information Systems Key Strategic Initiative.....	14
1.1.7	Fish & Wildlife Strategy Key Strategic Initiative.....	16
2.	IPR/CIR.....	17
2.1	Spending Level Development Process.....	17
2.2	Capital Spending Level Development.....	23
2.2.1	Overview of Capital Spending Level Development.....	23
2.2.2	Strategic Challenges.....	24
2.2.3	Investment Prioritization.....	26
2.2.4	Proposed Capital Spending.....	27
2.3	What's Not Here.....	28
3.	Power Services.....	30
3.1	Columbia Generating Station.....	35
3.2	Columbia Generating Station - Capital	39
3.3	Bureau of Reclamation and Corps of Engineers	41
3.4	Bureau of Reclamation and Corps of Engineers - Capital.....	48
3.5	Renewables	55
3.6	Energy Efficiency.....	59
3.7	Non-Generation Operations.....	65
3.8	Fish and Wildlife, Lower Snake River Comp Plan (LSRCP).....	71
3.9	Fish and Wildlife – Capital.....	76
3.10	Northwest Power and Conservation Council (NWPCC).....	81
3.11	Power Internal Support.....	85
3.12	Columbia River Fish Mitigation.....	89
4.	Transmission Services	91
4.1	Transmission Capital.....	96

4.2	System Operations.....	104
4.3	Scheduling.....	110
4.4	Business Support.....	116
4.5	Transmission Marketing.....	120
4.6	Maintenance.....	126
4.7	Environment – Pollution Prevention and Abatement.....	132
4.8	Environment – Capital.....	136
4.9	Engineering.....	140
4.10	Non-Between Business Line (Non-BBL) Transmission Acquisition and Ancillary Services 146	
4.11	Transmission Internal Support.....	150
5.	Agency Services.....	152
5.1	Corporate Overview.....	155
5.1.1	Customer Support Services.....	157
5.1.2	Environment, Fish and Wildlife.....	161
5.1.3	Corporate Strategy.....	165
5.1.4	Finance.....	171
5.1.5	General Counsel.....	175
5.1.6	Compliance, Audit and Risk Management.....	179
5.1.7	Information Technology.....	183
5.1.8	Information Technology- Capital.....	187
5.1.9	Communications.....	191
5.1.10	Intergovernmental Affairs.....	195
5.2	Chief Administrative Office (CAO) Programs.....	199
5.2.1	Safety.....	205
5.2.2	Human Capital Management (HCM).....	209
5.2.3	Security and Continuity of Operations (OSCO).....	213
5.2.4	Security and Continuity of Operations (OSCO) - Capital.....	216
5.2.5	Supply Chain.....	219
5.2.6	Fleet - Capital.....	222
5.2.7	Workplace Services.....	225
5.2.8	Facilities - Capital.....	228
6.	Acronym Glossary.....	232

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1. BPA OVERVIEW

The Bonneville Power Administration's **mission** as a public service organization is to create and deliver the best value for our customers and constituents as it acts in concert with others to assure the Pacific Northwest:

- An adequate, efficient, economical and reliable power supply;
- A transmission system that is adequate to the task of integrating and transmitting power from federal and non-federal generating units, providing service to BPA's customers, providing interregional interconnections, and maintaining electrical reliability and stability; and
- Mitigation of the FCRPS's impacts on fish and wildlife.

BPA is committed to cost-based rates and public and regional preference in its power marketing. BPA will set its rates as low as possible consistent with sound business principles and the full recovery of all its costs, including timely repayment of the federal investment in the system.

BPA's **vision** is to be an engine of the Northwest's economic prosperity and environmental sustainability. BPA's actions advance 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.

BPA delivers on these public responsibilities through a commercially successful business.

BPA's **core values** include:

Safety

BPA values safety in everything it does. Together, our actions result in people being safe all day, every day. At work, at home or at play, everyone at BPA contributes and is committed to a safe community for themselves and others.

Trustworthy Stewardship

As stewards of the FCRPS, BPA is entrusted with the responsibility to manage resources of great value for the benefit of others. BPA is trusted when others believe in and are willing to rely upon our integrity and ability.

Collaborative Relationships

Trustworthiness grows out of a collaborative approach to relationships. Internally BPA must collaborate across organizational lines to maximize the value brought to the region. Externally the organization must work with many stakeholders who have conflicting needs and interests. Through collaboration, BPA can discover and implement the best possible long-term solutions.

Operational Excellence

Operational excellence is a cornerstone for delivering on BPA's vision (system reliability, low rates, environmental stewardship and regional accountability) and will place the organization/utility among the best electric utilities in the nation.

BPA's mission and its vision are supported by the agency's strategic priorities: Our People; Physical Assets; Sustainable Finances and Rates; Reliable, Efficient and Flexible Operations; and the Natural Environment. These are ongoing, long-term outcomes BPA pursues across all dimensions of its business.

1.1 Key Strategic Initiatives

Our key strategic initiatives support and define how we will achieve our agency's strategic priorities. They are transformational, multi-year initiatives that are updated annually and implemented in a phased, programmatic approach.

(\$Millions)

KSI Expense	FY17	FY18	FY19
Safety & Occupational Health	4.5	4.6	4.7
Workforce	6.0	5.9	6.0
Asset Management	5.4	5.0	4.0
Long-Term Finance & Rates	1.6	2.3	2.4
Commercial Operations	10.0	25.0	25.0
Business Information Systems	4.3	4.3	4.6
Fish & Wildlife	0.0	0.0	0.0
Total Redeployed	16.4	16.6	17.1
Total Incremental Expense	15.4	30.5	29.6
Total Expense	31.8	47.1	46.7

*KSI costs for FY 2018-19 are estimated to be split between Power and Transmission with approximately \$19.5 million to Power and \$27.5 million to Transmission. For FY 2017, the split is estimated at approximately \$14.4 million to Power and \$17.4 million to Transmission.

BPA has estimated the spending levels needed to execute the work that is planned for the next rate period. To the extent possible, these spending estimates are met through redeployment of existing resources and included as part of proposed spending levels. What could not be met through redeployment was added to the proposed spending levels.

In addition to expense spending, the Business Information Systems KSI also includes capital dollars. The entirety of this capital spend given its strategic priority is expected to be a priority IT capital investment to be funded from the planned CIR IT spending levels. As a result the BIS KSI did not increase overall capital spending proposals. It is also expected that the initial scope of the BIS KSI will support system improvements needed for the Asset Management KSI.

(\$Millions)

KSI Capital	FY17	FY18	FY19
Business Information Systems	8.0	9.0	9.0
Total Redeployed	8.0	9.0	9.0
Total Incremental Capital	0.0	0.0	0.0
Total Capital	8.0	9.0	9.0

1.1.1 Safety & Occupational Health Key Strategic Initiative

BPA’s engaged employees and contractors are empowered to recognize job hazards and address safety and occupational health issues. Safety and occupational health are integrated into all aspects of work with a goal of zero injuries.

All of the Safety and Occupational Health KSI’s estimated expense was met through existing resources redeployed into proposed spending levels. There was no additional expense added to proposed spending levels as a result of this KSI.

KSI Expense (\$Millions)	FY17	FY18	FY19
Redeployed	4.5	4.6	4.7
Incremental	0.0	0.0	0.0
Safety & Occupational Health Total	4.5	4.6	4.7

Goals

The Safety Organization partners with business lines, safety committees, and other stakeholders to “come together” and provide compliant safety programs and industry best practice guidance aimed at building a strong safety culture. Our goals connect to the mission and value people in a way that fosters and creates a safe environment for safety dialogue and the prevention of incidents and injuries. The safety journey begins with ensuring all programs are in compliance with federal regulations and ultimately represent a best-in-class safety product.

1. Engage executives, agency leaders, and BPA workforce to build a strong safety culture across BPA. Engagement leads to a committed and productive workforce.
 - Increase agency’s understanding and application of human organizational performance, safety leadership, and safety by design concepts.
 - Leverage recognition to reinforce safe behaviors.
 - Continue to report and mature on leading indicators.

2. Minimize costs associated with employee injuries on and off the job and maximize resource availability.
 - Collaborate with executive management and the workforce to effectively implement a robust safety and health system.
 - Collect industrial exposure data.
 - Monitor industry improvements in the safety discipline, participate in industry forums and benchmarking exercises, and adapt health and safety practices to fit BPA's needs.
 - Ensure compliance with the Federal Employee Occupational Safety and Health (FEOSH) Program.
 - Provide industry leading safety and health compliance recommendations and oversight.
 - Review and update programs and procedures to ensure compliance.
 - Continue to implement program improvements.
 - Utilize benchmarking data, workload studies, and independent third-party reviews to identify best practices and leverage subject matter experts.

Value Add to the Agency

- Collaborating with executive management and the workforce to effectively implement a robust safety and health culture at BPA will ensure that accident and injury prevention remains a priority.
- Safety Program improvements have helped BPA reduce reporting lag time and meet compliance obligations through the adoption of standard requirements. This KSI will help BPA meet OSHA reporting requirements.
- Heightened awareness of safety throughout BPA has positively increased near-hit reporting. With this KSI, the Safety Organization expects to continue seeing a positive trend toward creating a strong safety culture.
- Providing a workplace free of recognized hazards will be a result of job observations, physical inspections and corrective action processes within the Safety Organization.
- Change management, training and employee recognition will encourage safe behaviors in the workplace creating a workplace environment that is conducive to employee satisfaction, recruitment, and operational excellence.

1.1.2 Workforce Key Strategic Initiative

BPA has diverse workforce of the right size and composition, with the right skills and competencies, working in a positive work environment to deliver on its public responsibilities and strategic priorities.

BPA's Talent Management Strategy identifies three strategic objectives for BPA's workforce to achieve established business outcomes. These objectives are to have a workforce that 1) is the right size and composition, 2) possesses the right skills and competencies and 3) works in a positive environment. BPA incorporated these into the Workforce Strategy key strategic initiative, showing foundationally how BPA will build people and culture to deliver business outcomes.

The Workforce KSI's expense level is the result of a more integrated and focused effort on key actions listed within this KSI. There was no additional expense added to the proposed spending levels as a result of this KSI.

All of the Workforce KSI's estimated expense was met through existing resources redeployed into proposed spending levels. There was no additional expense added to the proposed spending levels as a result of this KSI.

KSI Expense (\$Millions)	FY17	FY18	FY19
Redeployed	6.0	5.9	6.0
Incremental	0.0	0.0	0.0
Workforce Total	6.0	5.9	6.0

The Workforce strategy identified the following as priority initiatives to ensure BPA's has the right resources to accomplish the mission:

- Access to talent - Improving quality of applicant pool, timeliness of hiring, position strength and applicant experience
- Bench strength - Targeting leadership and individual development, retention, mission critical occupations and compensation
- Managing performance - Establishing clear expectations for workforce and providing meaningful feedback
- Work environment - Measuring workforce engagement and having a workforce that is diverse and inclusive
- Total workforce planning and management - Actively managing workforce composition and effective position management

1.1.3 Asset Management Key Strategic Initiative

Investments are created, selected and executed through leading practice based portfolio and project management practices.

BPA is improving asset management practices through the development of a comprehensive, standardized, and transparent approach to creating, selecting, executing and evaluating the performance of investment portfolios. The Asset Management Key Strategic Initiative (AM KSI) will advance the agency's asset management capabilities and level of maturity. BPA will continue efforts to establish leading practice-based portfolio management models including ISO 55001, PASS 55 and the Institute for Asset Management principles. The AM KSI will focus on the review and renew of current practices, as well as the development and implementation of revised and new policies, processes, standards and requirements to close the current gaps. The near-term emphasis will be renewing and/or implementing practices in three key areas: asset information, life cycle delivery, and risk and review. The opportunities in these areas are focused on highest priority and/or where there are the greatest benefits.

The Asset Management KSI’s estimated resource requirement can be partially met through redeployment of existing resources and includes incremental expense in FY 2017-19, after redeployment of \$2.6 million of existing resources each year.

KSI Expense (\$Millions)	FY17	FY18	FY19
Redeployed	2.5	2.6	2.6
Incremental	2.9	2.4	1.4
Asset Management Total	5.4	5.0	4.0

A key component of the funding for the AM KSI is to evaluate and update our asset registers and ensure that the data effectively supports decision-making efforts. **Asset information** will be standardized, structured and systemized to ensure activities focus on areas that will provide the most benefit. The continuous improvement of asset information is crucial in advancing the refinement of asset replacement decisions to:

- Reduce unexpected failures.
- Avoid unnecessary premature replacement of assets.
- Diminish risk.
- Improve reliability and cost savings.

BPA’s major capital projects are often complex, multi-year projects that expose the agency to cost and schedule uncertainties. BPA has launched major new initiatives in the transmission and federal hydro asset categories through the Asset Management Program Delivery and Asset Investment Excellence Initiatives to deliver improvements in the **life cycle delivery** practices. Through these initiatives, BPA will implement asset plans with focused integration of activities. The review and renew of BPA’s processes will ensure a robust, systematic consideration of alternatives to meeting investment needs, and implement leading practice-based portfolio and project management practices.

The AM KSI advancements will ensure that the prioritization process is effective and that capital investments are being made on projects that yield best whole-life cost decisions; a higher return measured as capacity, reliability, revenue and environmental protection. The AM KSI will refine and deliver a more robust set of **risk and review** methods that will result in internal controls and audit mechanisms that assure objectives are being met and support continuous improvements ensuring:

- Tighter alignment between investment priorities and the agency’s strategic direction.
- Effective feedback of sustain asset strategies.
- Higher success rates in delivering the identified benefits.

1.1.4 Long-Term Financial & Rates Strategy Key Strategic Initiative

BPA markets power and transmission services at the lowest possible cost, while providing reliable operations, sustainable and affordable investment strategies and long-term, financial health, and meeting its public purpose objectives and statutory obligations. BPA’s current long-term Regional Dialogue power sales contracts with regional power customers expire in 2028.

In relation to the expiration of BPA’s Regional Dialogue contracts, the Long-Term Financial and Rates Key Strategic Initiative was adopted in FY 2014 with the objective of delivering cost-based power and transmission services priced to fully subscribe the FCRPS power supply among regional power customers in 2028 while balancing the goals of low rates, reliable operations, sustainable and affordable investment strategies and long-term financial health while meeting BPA’s public purpose and statutory obligations. This KSI has three key focus areas, including development of the analytical tools to forecast long-term power and transmission rates, establishment of a more robust cost-management focus and tools to effectively manage costs, and defining a long-term competitive position for BPA.

The Long-Term Financial and Rates KSI’s estimated funding requirements can be partially met with existing resources slated to be redeployed. Incremental additional resources will be needed.

KSI Expense (\$Millions)	FY17	FY18	FY19
Redeployed	0.4	0.4	0.4
Incremental	1.2	1.9	2.0
Long-Term Finance & Rates Total	1.6	2.3	2.4

The first focus area for the KSI is the development of a full **analytical capability** to quickly and systematically analyze scenarios (what-if questions) to evaluate the impact of variables, such as capital and expense spending considerations, on long-term power and transmission rates. The focus area was designed to supply the critical long-term financial and rates information that is essential when BPA makes strategically important decisions.

A long-term financial and rates forecasting model was initially developed in FY 2015 to fill the gap that was identified in the analytical area. It has already received some enhancements with more anticipated in the future. Several enhancements that are currently being evaluated include: systematizing input collection and data storage, expanding the model to incorporate the repayment study and revenue requirement development processes which are currently housed outside the modeling tool, and automating more reports. Completing these enhancements will improve the efficiency, accuracy and speed of this analysis and ultimately make the model more valuable for strategic decision-making.

BPA will continue to produce a reference case at least annually. The reference case provides a rolling 15-year analysis of BPA’s financial condition and rates using spending level assumptions from the most recent IPR and CIR processes, current market and load forecasts, and out-year program-specific escalation projections.

The second focus area for the KSI is **cost management**. During FY 2016, BPA integrated capital and expense funding decisions to better optimize investments and constrained IPR costs through thorough examination of expense requests and the resulting potential rate impacts. Going forward, BPA will perform a gap analysis between our current state and best practices related to cost management to further refine the spending level development, execution, and monitoring processes. BPA’s goal is to increase the effectiveness of these processes providing more certainty to

the customers and stakeholders that BPA is spending its funds on the highest priority items and most efficiently.

BPA will work to establish an even more cost conscious culture and to develop a cost control framework which will include empowering spending level analysts with additional tools and skills necessary to effectively manage costs. Budget analysts will be hired and/or retrained to provide more analytical support to managers and executives so that informed trade-off decisions can be made in real-time before funding is spent. This additional analytical capability is expected to identify pockets in the agency that may be ripe for a process review leading to more efficient operations and more value to the region at less cost.

Competitive analysis is the third focus area for the KSI. This work is core to the intent of Focus 2028 where BPA and its stakeholders discussed BPA's ability to be cost competitive and financially strong in a very dynamic industry. BPA is currently performing a competitiveness analysis to assess what long-term competitiveness is for BPA and the region. BPA will review and build on its internal analysis which will lead to establishing a long-term competitiveness benchmark that BPA will use to evaluate strategic decisions against. The results of the competitive analysis will be focused on rates and quality (reliability, environmental, etc.) of services and programs and will begin to serve as the basis for setting long-term rate targets that will drive future decision-making, strategies and policies.

All three focus areas of this KSI work in conjunction with one another. The results of the competitiveness analysis will be used to create a long-term benchmark to compare results from the long-term rate forecasting model against, and a means for maintaining competitiveness over time will include managing costs effectively. Combined together, this KSI will increase value to the region by providing greater insight into our financial future and the tools to successfully manage our costs to be competitive for decades to come.

1.1.5 Commercial Operations Key Strategic Initiative

The goal for this KSI is to ensure BPA is fully enabled with the core functionality required to successfully participate in the management of a regional modernized electric grid.

As wholesale electricity markets continue to evolve, so must BPA's ability to operate in these markets. This KSI will ensure we continue to provide reliable, efficient and flexible operations in a regional modernized grid.

Through this effort, we intend to leverage the opportunities and minimize the risks presented by the rapid advance of sub-hourly markets. This work will include investments in internal capabilities, such as transmission inventory management, congestion management and outage tracking.

In addition, BPA will coordinate with the California Independent System Operator and other participants in the expanding Western Energy Imbalance Market to proactively shape the markets developing around us. Our interests are to:

- Identify the emerging market’s impacts on our system.
- Protect and enhance our ability to serve our power and transmission customers.
- Preserve the value of our federal assets.
- Look for opportunities to co-optimize our power and transmission assets.
- Continue to meet our fish and wildlife obligations for the operation of the federal hydropower system.
- Fulfill our statutory, contractual and regulatory obligations.

Potential benefits of greater coordination between entities include: enhanced situational awareness, operational efficiency and congestion management; and the ability to regionally plan the transmission system more reliably and proactively. In addition, as the market landscape changes and the amount of renewable resources continue to increase, there may be new opportunities to market the flexibilities of BPA’s hydro resources.

The Commercial Operation KSI’s estimated funding requirements are highly uncertain and BPA is developing refined estimates. Current estimates are that funding requirements for FY 2018-19 will be at approximately \$25 million per year of additional incremental spending.

KSI Expense (\$Millions)	FY17	FY18	FY19
Redeployed	0.0	0.0	0.0
Incremental	10.0	25.0	25.0
Commercial Operations Total	10.0	25.0	25.0

1.1.6 Business Information Systems Key Strategic Initiative

The objective BPA’s Business Information Systems KSI is to optimize the value and reliability of agency decisions and enhance the accountability, integrity, insights and value of supported activities for our stakeholders and the region.

The BIS KSI’s estimated funding requirements can be partially met with existing resources slated to be redeployed. Incremental additional resources will be needed.

KSI Expense (\$Millions)	FY17	FY18	FY19
Redeployed	3.0	3.1	3.4
Incremental	1.3	1.2	1.2
Business Information Systems Total	4.3	4.3	4.6

In addition to expense spending, the Business Information Systems KSI also includes capital dollars. Given its strategic priority, it is expected to be a priority IT capital investment to be funded from the planned CIR IT spending levels. As a result the BIS KSI did not increase capital spending proposals. It is also expected that the initial scope of the BIS KSI will support system improvements needed for the Asset Management KSI.

KSI Capital	FY17	FY18	FY19
Business Information Systems	8.0	9.0	9.0
Total Redeployed	8.0	9.0	9.0
Total Incremental Capital	0.0	0.0	0.0
Total Capital	8.0	9.0	9.0

BPA’s Business Information Systems are the foundation for BPA’s day-to-day business operations across the entire agency. The vast majority of the systems supporting financials, asset management, Human Capital Management, payroll, supply chain, work management, customers, contracts, billing, and real property were implemented over a decade ago and are in need of replacement or major investment in the next few years. Currently, BPA’s business operations capabilities are less efficient and effective than needed to achieve BPA’s long-term strategic objectives. Also, the renewed long-term focus on leadership, governance and cost structure at BPA provides a window to redesign business processes and supporting applications to drive efficiencies. BPA’s leadership team is prioritizing the need for quantifiable analytics and information to guide strategic decisions. Defining a structured process for change and approach to enterprise application management aligned to BPA’s strategic priorities will improve the quality of systems-related expenditures in the future.

BPA undertook the Business Information Systems Key Strategic Initiative in FY 2016 in order to assess the current state, develop an enterprise-wide strategy, develop a roadmap (including prioritization), and implement the strategy and roadmap over the next several years as part of the Focus 2028 initiative. The strategy and roadmap will establish a clear partnership between the business units and information technology with clear ownership of business functions and business drivers as targets. We will deliver solutions that optimize the value and reliability of agency decisions, and enhance the accountability, integrity, insights, and value of supported activities for our stakeholders and the region. Both the strategy and the roadmap will drive cost management through best practices defined for enterprise management, including processes, information, and systems/technology. Some examples of business operations benefits to be realized are: reduced variability and quality reviews needed for reports and analytics (through enterprise information management and business intelligence), better asset strategy decisions across all categories (through process standardization and enterprise information management), and improved workforce productivity through automation and workflows.

In the future, BPA’s executives will be better equipped to look at shared processes, data, and measures across all of BPA. Organizations within BPA will have a more common systems vernacular and improved analytical capabilities, including real-time visibility and transparency into financial and operational impacts of what-if scenarios. Reporting to regional constituents and stakeholders, as well as to government entities such as DOE, OPM, OMB, Treasury and others, will be simpler and more consistent. BPA’s basic business functions will be supported with integrated, interoperable, efficient and effective systems, whose maintenance and replacement over time is planned to optimize performance and net value. Most importantly, BPA will have business information processes and systems that drive operational excellence and continuous process improvement.

1.1.7 Fish & Wildlife Strategy Key Strategic Initiative

BPA meets its Endangered Species Act, Northwest Power Act, and tribal responsibilities using a performance-based approach, including setting and achieving performance metrics that fully address BPA's obligations through a combination of hydro, habitat, hatchery and predator-management actions.

BPA is committed to fulfilling its fish and wildlife protection and mitigation responsibilities using a performance-based approach, while also assuring an economical and reliable power supply. BPA takes an "All H" or lifecycle approach: first, hydro actions to improve fish survival, and then habitat protection and enhancement actions in addition to and hatchery production, to address for remaining fish and wildlife impacts of federally owned hydroelectric dams. BPA strives for a program, including hydrosystem operations and configuration that is scientifically credible, legally defensible, cost effective, and has broad regional support.

A primary goal is increased or maintained abundance and survival of species listed under the Endangered Species Act and other species of concern, including salmon, steelhead, bull trout, Kootenai white sturgeon, and lamprey. BPA will continue to implement actions to provide benefits to whole ecosystems, where actions for one species also provide broad and continuing benefits for other species. BPA actions are supported and implemented through regional sovereigns and other partners.

The Fish and Wildlife KSI's funding requirements are within Fish and Wildlife spending plans with no additional incremental cost.

2. IPR/CIR

2.1 Spending Level Development Process

Throughout the last IPR and CIR and most recently the Focus 2028 meetings, customers and regional stakeholders emphasized that BPA should increase the level of rigor and scrutiny in effectively managing its costs. For the 2016 IPR/CIR process, the main focus is fiscal year 2017 and the FY 2018-19 rate period. In addition, high-level forecasts were gathered through 2030 to complement the Focus 2028 dialogue and provide inputs into the long-term financial and rates analysis.

To better align the IPR/CIR with BPA's long-term rates goals and to foster strategic discussions with stakeholders and customers, executive direction was given to reduce costs to keep any potential cost increases to a bare minimum while still keeping in mind the long-term impacts of the near-term spending level decisions. This is consistent with one of the 2016 IPR improvements identified during Focus 2028 in which we would use cost targets informed by the short- and long-term potential rate levels, financial health, and competitiveness.

The proposed capital spending levels were set after considering impacts on BPA's revenue requirements and how that compares to BPA's overall objective of long-term rate competitiveness and the needs of the federal system. Proposed expense spending levels were set at the spending pool level and were informed by the minimal rate increase objective, taking into account all of the other costs in the revenue requirements such as capital-related, non-IPR and market-driven costs that would make up the total rate impacts felt by the region.

Similar to the 2014 IPR, the method for developing IPR proposed spending levels is grounded in actual results. Organizations were requested to identify the expense work they expect to accomplish in FY 2017-19. They were provided with a baseline spending level equal to 100 percent of their FY 2015 actual spending. Organizations then prioritized their work that needs to be performed during FY 2017-19, informed by the goal of keeping any potential cost increases as low as possible. Any spending requests in excess of the baseline were subject to further scrutiny including justification provided to the applicable pool manager by the requesting program manager, department manager or executive. Requests in excess of the baseline competed with requests from other organizations for funding. Applicable organizations needed to ensure that their IPR spending levels included the cost estimates for implementing BPA's KSIs.

To encourage discussions of trade-offs and the prioritization of funding requests, all of BPA's costs were consolidated into four distinct spending level pools: Power, Transmission, Chief Administrative Office and Corporate. Compared to the 2014 IPR, the make-up of each of the spending level pools changed slightly due to the reorganization of the Executive Office and the creation of the Chief Administrative Office (CAO). BPA decided to separate the CAO into its own pool and combine the Chief Operating Officer and the Deputy Administrator's pool into a new "Corporate Pool". The CAO and Corporate pools make up Agency Services. Keeping just two Agency

Services pools retains flexibility by including a broad cross-section of departments and programs. The Transmission and Power pools are unaffected by this change.

Each pool received considerable scrutiny and was managed by the following executives – the senior vice presidents of Transmission and Power, the Chief Administrative Officer, and the Chief Operating Officer (in this document, CAO and Corporate are combined into Agency Services) – referred to as pool managers.

Spending Pool Program Summary			
Transmission	Power	CAO	Corporate
<ul style="list-style-type: none"> • Business Support • Engineering • Maintenance • Marketing • Scheduling • System Operations • Transmission Acquisition and Ancillary Services 	<ul style="list-style-type: none"> • Bureau of Reclamation • Columbia Generating Station • Corps of Engineers • Energy Efficiency • Non-Generation Operations • Renewables 	<ul style="list-style-type: none"> • Human Capital Management • Internal Operations • Safety • Security and Continuity of Operations • Supply Chain • Workplace Services 	<ul style="list-style-type: none"> • Communications • Compliance, Audit and Risk • Customer Support Services • Corporate Strategy • Finance • Environment, Fish and Wildlife • General Counsel • Intergovernmental Affairs • Information Technology

Organizations determined full-time equivalent (FTE) employee levels based on agency needs and priorities. Existing FTE allocations served as initial guidance, but organizations made strategic choices about staffing rather than automatically budgeting to historic FTE levels. This approach is consistent with budgeting improvements identified in Focus 2028. Groups who proposed FTE increases were asked to evaluate scaling back or eliminating other projects to offset the costs. Managers and executives faced difficult trade-offs when deciding how to incorporate KSI costs and were tasked with developing plans to redeploy employees in some circumstances.

Pool managers considered all requests for additional funds to determine which increases to include in the IPR proposed spending. The pool managers then raised those requests to an IPR executive sponsor team and the administrator to provide additional centralized oversight and controls over proposed spending levels. This method ensured additional funding above FY 2015 actual spending went to the highest priority programs.

The summary level results for each of the spending level pools:

(\$ Thousands)	Pool Results Summary		
	FY17	FY18	FY19
Pool	Proposed	Proposed	Proposed
Transmission	311,457	314,829	318,111
Power	917,399	901,162	969,245
CAO	114,415	117,373	119,988
Corporate	521,906	550,160	556,037
Grand Total All Programs	1,865,177	1,883,524	1,963,381

Proposed Spending Assumptions

The table below outlines the assumptions that organizations applied to the development of their spending levels.

Spending level Assumptions			
Assumption	FY17	FY18	FY19
Cost of Living Adjustment	1.50%	1.84%	1.90%
Step and Grade Increases	1%	1%	1%
Benefits as a percentage of salary	34.07%	34.89%	35.71%
General Inflation (non-personnel)	1.81%	1.84%	1.90%
Awards assumptions are consistent with DOE requirements.			

General Allocation of Agency Services Costs

Costs resulting from Agency Services organizations must be included in the Power and Transmission revenue requirements. Some costs are direct charged to Power and Transmission O&M programs, and some are allocated. The allocation process is accomplished through General and Administrative and Support Services (G&A) cost pools.

Agency Services General Allocation Methodology

The G&A and Business Support pools are collections of costs from the centralized Agency Services organizations. The description of products and services provided by these organizations can be found in the individual organizations' executive summaries.

BPA has 14 G&A cost pools: Executive; IT Applications System Support; Security; Legal Services; Human Resources; Finance and Accounting; Safety; IT Management and Administrative; IT Infrastructure; IT Cross Agency Projects; Workplace Services; Public Affairs; Dedicated Workplace Services Power/Transmission, and Agency Services Awards.

In addition, BPA has 10 Business Support pools. These are: Strategic Integration; Risk; IT Dedicated Projects Power/Transmission; Supply Chain Administrative; Supply Chain Purchasing; Technology Innovation; Aircraft Services; Billing and Metering Services; and Contracting and Forecasting Services. These Business Support pools are assigned to the Power Services and Transmission Services programs that directly benefit from the services provided. The description of these services can be found in each benefiting program summary.

G&A and Business Support pools are used to spread shared corporate costs to the Power Services and Transmission Services business units.

Before each IPR process, BPA's Accounting and Reporting group conducts a review of the Agency Services cost allocation pools and the cost drivers used to assign Agency Services costs to Power and Transmission rates. As part of this review, they meet with key managers to verify that the makeup of the cost pools and the drivers are up-to-date and accurately reflect cost causation.

Each pool is examined to determine the appropriate drivers of cost. The drivers are used to determine the allocation rates. The costs associated with these pools are assigned to the Agency Services G&A program or the benefiting O&M program for each business unit.

When the allocation rates are reviewed, these principles apply:

- Methodologies are equitable and fair.
- Methodologies represent a causal relationship to the services provided.
- Methodologies are defensible in a rate setting environment.
- Methodologies are defensible with internal and external auditors.
- Methodologies can be implemented and are cost effective.
- Methodologies are direct and simple: improving understanding and transparency.
- Methodologies are used to develop rates that will be implemented and unchanged on an annual basis without exception.

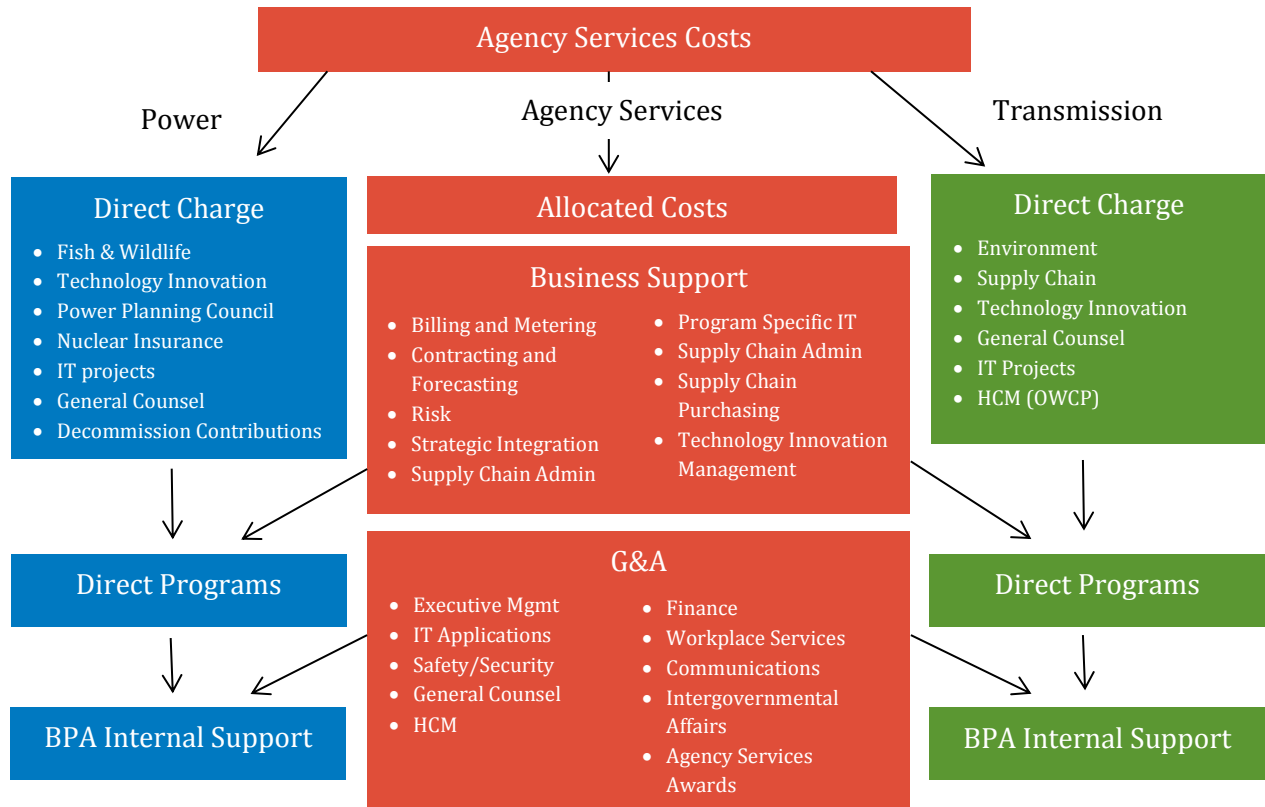
G&A and Business Support costs can be allocated either evenly to the Power and Transmission business units or based on specific cost drivers, such as number of employees or square footage occupied.

- Even Allocations - Traditional General and Administrative Costs: Cost pools that serve the general purpose of agency support functions (split 50/50 to power and transmission rates).
 - No consistent, measurable method of assigning support costs directly to the benefactor.
 - Functions are general in nature and are not directly affected by changes in traditional cost drivers (i.e., FTE levels, spending levels, etc.).
 - Collection of costs or measurement of driver is cost prohibitive – it is uneconomical to attempt more precise allocations.
 - Lack of causal relationship to benefactors prevents a clear distinction for assigning those costs.
- Directed Allocation Pools: Cost pools that can be distributed with more precision, based on specific cost drivers (split other than 50/50 to power and transmission rates).
 - Activities are managed and spending leveled centrally, but methods exist to assign costs to benefactors.
 - Functions can be linked to cost drivers and can change based on those drivers.
 - Direction of effort studies or other means can be used to allocate in a cost-effective manner.

Upon completion of the cost pool review, potential changes to allocations are presented to the Accounting Officer and the Chief Financial Officer for review and approval. They are then implemented in the IPR; the upcoming year's budget and the allocation of actual costs.

The accounting review for the 2016 IPR resulted in minor changes to a number of pools. The most significant change came in the methodology for allocating overheads assigned to transmission capital, which was modified to use a more disaggregated approach to allocating costs to transmission’s capital programs. Under the more disaggregated approach BPA used additional drivers against G&A cost pools. The resulting allocation percentage is very close to the percentages in BP-16.

The following graphic depicts how agency services costs are assigned to the business units.



FY 2017 & 2018/19 IPR G&A Allocations

	COST POOL	2017/IPR Rates		2016 Rates		DRIVERS	COMMENTS
		POWER	TRAN	POWER	TRAN		
1	G&A EXEC/PLANNING/GOVERNANCE	50%	50%	50%	50%	Standard rate with no consistent, measurable method of assigning support costs. Functions are general in nature. This rate does not get adjusted year-to-year. Appropriateness of costs charged to this pool were reviewed.	Corporate awards were moved from this cost pool to a separate awards pool and Asset Management was moved from Strategy to Finance.
2	G&A APPLICATION SYSTEM SUPPORT	35%	65%	35%	65%	Applications in this cost pool follow the profile of benefiting Power and Transmission at a rate of 35%-65%.	Applications should fit the profile of 35%-65% to be in this IT application cost pool.
3	G&A SECURITY SERVICES	12%	88%	12%	88%	Rate established by a direction of effort study (time spent by security staff for Power and Transmission).	This cost pool includes security for the Transmission system and BPA administrative buildings. Headquarters is a very small part of the overall program.
4	G&A LEGAL SERVICES	50%	50%	50%	50%	Standard rate that does not get adjusted year-to-year. Cost charged to the pool are reviewed to determine that they are appropriate.	Higher percents were budgeted as Corporate Business Unit rather than direct charged to the business lines in the fiscal year 2016 budget.
5	G&A HUMAN RESOURCE SERVICES	23%	77%	24%	76%	BFTE count by business unit.	Organizationally the library was moved from HR to Communications in 2016 but the library remains in the HR cost pool as the benefits are more consistent with the HR cost pool. Administrator's Award Program moved to Public Affairs cost pool. Medical surveillance moved to Safety cost pool.
6	G&A ACCOUNTING & FINANCE	45%	55%	45%	55%	Most costs in this pool are 50-50%. Exceptions are budget, payroll and Accounts Payable. Rate impact for these costs are based on budget support for Power and Transmission, BFTE for payroll, and number of vouchers for AP.	Asset Management moved from Strategic Affairs to Finance.
7	G&A SAFETY	6%	94%	18%	82%	Direction of effort study looking at business line program support provided by the Safety organization.	Safety is a key agency target and budgets were increased accordingly. Safety had a major reorganization in FY16. Medical surveillance was moved from HR to Safety.
8	STRATEGIC INTEGRATION	50%	50%	50%	50%	Standard agency rate that does not get adjusted year-to-year. Confirmed that the rate is still appropriate. As initiatives mature, they are moved as direct charge into the business lines.	Certain functions for this program are ramping down. The EIM/SCED initiative is being transformed into the Commercial Operations KSI and may be moved to the business lines.
9	RISK MANAGEMENT	62%	38%	60%	40%	Direction of effort study looking at risk support for Power and Transmission Services.	Allocation percentages by department are provided by the Risk Office.
10	G&A IT ADMINISTRATION	29%	71%	31%	69%	Rate based on weighted average for the other IT cost pools.	More quality assurance, administration and training moved into the IT Administration pool starting in fiscal year 2015.
11/12	DEDICATED IT PROJECTS	100%	100%	100%	100%	Dedicated applications for Power and Transmission Services. Rate does not get adjusted year-to-year.	This actually consists of two separate pools, one for Power and one for Transmission.
13	G&A IT INFRASTRUCTURE	22%	78%	25%	75%	FTE count by business line. For comparative purposes also looked at number of IT devices and phone services by business line which would have produced similar results.	IT provides a detailed list of devices by Department and Employee. These are assigned to high level agency functions in support of Power, F&W and Transmission.
14	G&A CROSS AGENCY IT PROJECTS	50%	50%	50%	50%	Standard agency rate that does not get adjusted year-to-year. Projects in this cost pool benefit Power and Transmission Services equally.	Very few projects are charged to this 50-50% pool.
15	G&A WORKPLACE SERVICES	46%	54%	47%	53%	B/CFTE count by business unit for employees in leased space. Also use a combination of B/CFTE by location for other services, as applicable to the nature of the cost.	Almost 40% of the costs in this pool are for leases at HQ, Washington DC (DOE Forrestal), and field administrative offices. Munro maintenance, janitorial, utilities and furniture are charged into this Corporate workplace services cost pool.
16	SUPPLY CHAIN ADMINISTRATION	11%	89%	7%	93%	Overall rate based on program level support by Supply Chain management.	Rate is based on the underlying rates for all other Supply Chain cost pools.
17	G&A PUBLIC AFFAIRS	50%	50%	50%	50%	Standard agency rate that does not get adjusted year-to-year. Costs charged into this cost pool were reviewed for appropriateness.	Organizationally the library was moved from HR to Communications in 2016. Communications picked up the Administrator's Award program from HR.
18	SUPPLY CHAIN PURCHASING SERVICES	64%	36%	66%	34%	Weighted average of actual costs charged to environment, EE, Power, IT and Corporate work orders within the Agency Purchasing cost pool.	The rate is determined by Work Order costs in this cost pool charged specifically to IT, Env, F&W, Power, etc.
19	TECHNOLOGY INNOVATION	50%	50%	50%	50%	Standard agency rate that does not get adjusted year-to-year.	As projects mature, they are passed to either Power or Transmission.
21/22	G&A WORKPLACE DIRECT PROJECTS	100%	100%	100%	100%	Dedicated workplace services for Power and Transmission	There are two cost pools for Workplace Direct Projects--one exclusively for Power and the other one for Transmission.
23	BILLING & METERING SERVICES	48%	52%	47%	53%	Direction of effort study with information provided by the responsible Department managers.	Study looks at drivers such as the number of bills, complexity of bills, and metering services.
24	CONTRACTING & FORECASTING SRVC	47%	53%	54%	46%	Direction of effort study with information provided by the responsible Department managers.	Increase to Trans due to more workload for CCM/CDM associated with # of contracts, active tasks, contract templates, workflow and internal users of CCM and CDM.
25	AWARDS	40%	60%	0%	0%	Based on overall Corporate G&A personnel costs for Power and Transmission	This is a new cost pool. Costs were moved from the XXZA cost pool.

Rates for Leave and Benefits, Aircraft Services, Workplace Services Capital for the Van Mall, and Transmission Capital Indirects will be set at a later date. G&A allocation dollars overall for G&A for Power and Transmission traditionally run 38%/62%, respectively.

2.2 Capital Spending Level Development

In 2006, BPA launched an asset management initiative as part of its Enterprise Process Improvement Project. In 2007, the first asset management strategy was created to reform internal processes and guide BPA's investment planning. From there, asset strategies have been developed by BPA's asset categories and presented for public comment on a 2-year cycle.

The asset management strategies set the direction for maintaining, replacing and adding capabilities to the power and transmission systems. Strategies have called for a ramp-up in capital spending to manage the risks of an aging system, meet long-term capacity and flexibility needs, fulfill regional commitments in fish and wildlife, and improve internal efficiency.

In the 2014 Capital Investment Review, BPA introduced the concept of an "Affordability Cap" coupled with the newly implemented organization-wide capital prioritization process that started in 2013. The 2016 combined IPR/CIR takes this a step further. Over the past two years BPA has developed the capability to forecast scenarios of long-term rates through 2030 based on various given assumptions. This was first introduced in the fall of 2015 when a reference case was developed and shared with customers through the Focus 2028 external process. For the 2016 IPR/CIR, an update to the 2015 reference case has been prepared. This past winter, in preparation for establishing capital levels for the 2016 CIR, several capital investment scenarios were developed and assessed using the long-term rates model. This process, rather than the affordability cap, was used to establish the "going in" capital levels for 2016 IPR/CIR.

One of BPA's top strategic priorities continues to be to preserve and enhance transmission and federal generation assets and the economic, environmental and operational value they create. In this 2016 CIR, BPA presents its next generation of long-term asset strategies and prioritized capital investments. The 2016 draft asset strategies represent another step toward improved planning and management of BPA/FCRPS assets. The strategies cover a planning horizon of 14 years, FY 2017-30, and the priority and focus continues to be on replacing and maintaining an aging fleet of transmission, generation, facilities and information technology assets.

The IPR/CIR process provides stakeholders an opportunity to comment on BPA's draft asset strategies and proposed capital spending levels. Executive summaries of the draft asset strategies for Federal Hydropower, Transmission, Facilities, Information Technology, Fish and Wildlife, Fleet and Security are available for review via links on BPA's [IPR/CIR website](#).

2.2.1 Overview of Capital Spending Level Development

BPA is committed to cost-based rates, and public and regional preference in its marketing of power. BPA will set its rates as low as possible consistent with sound business principles and the full recovery of all its costs, including timely repayment of the federal investment in the system.

We will achieve our mission by focusing on five priorities for capital spending, guided by key strategic initiatives and measured by key performance indicators. In one of BPA's five priorities, physical assets, BPA will execute sustainable and affordable investment strategies to maintain and modernize clean and renewable power and transmission system infrastructure. The asset

management KSI will create, select, and execute investments through portfolio and project management best practices.

Physical assets — such as hydroelectric dams, transmission lines, substations, information systems, and investment in fish and wildlife mitigation – enable BPA and its FCRPS partners to deliver on its mission and vision. Here are brief descriptions of the assets funded and managed by BPA:

Federal hydro assets are comprised of 31 hydroelectric plants with over 200 generating units. Installed generating capacity is over 22,000 MW; in an average water year, 76 million megawatt-hours of electricity is generated. Twenty-one of the plants are owned and operated by the Corps of Engineers and 10 by the Bureau of Reclamation.

Transmission assets include 15,100 circuit miles of high-voltage transmission lines, 261 substations, 732 communications sites, and 195,600 acres of transmission line corridor rights-of-way. Transmission assets also include hardware and software applications for grid operations. Transmission assets are owned or leased by BPA.

Facilities assets include substation control houses, administrative offices, maintenance shops, warehouses and other non-electric plants. BPA owns over 1,000 buildings at over 400 sites in five states. Another 12 buildings are leased.

IT assets include desktops, laptops, and other office automation hardware and software; servers, operating systems, and other data center hardware and software; data, voice, and video network systems; and applications for a range of business purposes. These assets are owned by or licensed to BPA.

Fish and Wildlife assets include habitat protection for tributary passage, fish hatcheries, conservation land acquisitions and culvert replacements. The assets also include fish and wildlife improvements at federal dams and fish hatcheries. The assets are owned and operated by federal and state agencies, conservation organizations, tribes, and private property owners.

The **Columbia Generating Station**, a nuclear generation plant, is not covered by BPA asset strategies at this time. CGS is owned and operated by Energy Northwest.

2.2.2 Strategic Challenges

One of BPA's most important strategic objectives is to maximize the long-term operational and economic value of power and transmission system assets. This objective is accomplished by maintaining and investing in the system so that:

- Assets operate efficiently and effectively and provide the capacity and capabilities needed to meet reliability, availability, environmental, health and safety, security, and other standards.
- Total economic costs are minimized over the long-term. Total economic costs include not only BPA's costs to expand, replace, and maintain assets, but also the costs that customers and others may bear should the assets fail to perform (customer outages).

This strategic objective must be accomplished while considering long-term cost structure, financing implications and other objectives.

Managing the risks of aging infrastructure

Preserving and enhancing federal generation assets and transmission — and the economic, environmental and operational value they create — is a strategic priority.

The majority of the transmission system and its high-voltage power lines and substations are more than 40 years old. Much of the critical infrastructure needs to be replaced or upgraded so that equipment continues to provide the reliable service and the capacity and capabilities that will be needed.

The average age of the federal hydroelectric plants is about 50 years, with some that exceed 60 years. In some cases, federal hydro assets are reaching and exceeding the end of their expected service lives. Age alone is not an indicator of when an asset should be refurbished or replaced. The physical condition and performance and corrective maintenance history of equipment and facilities are often the bigger drivers for planning and prioritizing replacements.

Comparable risk assessments are prepared for Transmission, Facilities and IT assets, and are found in the respective asset management strategies. The risk assessments play a key role in prioritizing refurbishment, replacement, and certain upgrade investments.

Managing technological change

For some classes of equipment, such as telecommunications and control systems equipment, technological obsolescence remains a major risk in meeting today's operational demands, maintaining long-term system reliability, and managing maintenance and repair costs. There are multiple generations of telecommunications and control systems equipment on BPA's system, which has led to interoperability problems and increasing maintenance and repair costs. Meanwhile, the rapid evolution of telecommunications technologies could lead to shortages of spare parts and technical skills deficits for repairing older equipment.

New technologies also present opportunities for greater efficiency and effectiveness. For example, evolving server technologies and industry trends toward cloud-based services enable growing information requirements to be met less expensively than otherwise.

As another example, synchronized phasor measurement units are being deployed by BPA and several other utilities in the Western Interconnection. The synchrophasors enhance real-time awareness of grid performance, which in turn helps reduce the risk of outages, enables faster restoration of the system should an outage occur, improves utilization of transmission assets, and enables better management of transmission congestion.

Technological advances are instrumental to the success of many industry-wide initiatives, to include: integrating variable energy resources, enhancing the reliability and efficiency of system operations, deploying demand response programs, and enabling energy storage devices.

Manage increasing demands on the power and transmission system

In recent years, demands on the transmission and power system to integrate renewable resources have been significant and have led to new transmission and federal hydro system infrastructure to provide the balancing reserves for renewable energy while maintaining operations for fish passage.

In the future, BPA will need to rely on existing capacity and flexibility to meet demands.

Meet evolving compliance requirements

The Energy Policy Act of 2005 subjects BPA and all utilities to a wide range of North American Electric Reliability Corporation reliability standards enforced by the Western Electricity Coordinating Council. The challenge that BPA and similar entities face is the amount and rate of change in reliability standards since their inception. A larger share of BPA's investment in transmission is now being driven by reliability and other regulatory requirements.

Growth in security and continuity of operations requirements to protect critical infrastructure has been rapid. BPA's information technology systems must conform to evolving federal and industry-mandated laws and regulations.

Implement Endangered Species Act requirements

The FCRPS Biological Opinion is the federal plan for operating 14 main stem Columbia and Snake River hydroelectric dams while protecting Endangered Species Act listed salmon and steelhead.

BPA's capital investment portfolio

BPA is ramping up capital investment to manage risks of an aging system, to integrate new generating resources, to relieve system constraints, and meet fish and wildlife commitments, while improving the efficiency of internal operations. The impact of capital spending on power and transmission rates, long-term cost structure, financing and other objectives are key criteria in prioritizing capital investment in the long-term.

2.2.3 Investment Prioritization

In the 2014 CIR, we introduced the concept of a capital "affordability cap" and described the capital prioritization process with respect to that cap. At that time, the capital spending cap was set at \$940 million per year over a ten-year period. While that cap considered rate impacts, it was primarily predicated on access-to-capital factors.

As described in the Focus 2028 process and in earlier sections of this document, our concept of "affordability" has evolved to be primarily focused on long-term rates and future competitiveness. Instead of an affordability cap, we have proposed spending levels that we believe will further BPA's long-term competitiveness. This change requires an adjustment to the capital prioritization process:

- There is no longer a single capital cap. BPA is managing to Transmission and Power spending levels: informed by the rate impacts of the investments for both Power and Transmission rates. This requires that BPA split its prioritization process to produce a separate prioritization for Transmission and another for Power. Rather than prioritize across the agency, BPA needs to focus on selecting the highest value investments within the capital levels available to Transmission

Services and Power Services organizations.

- BPA will continue to prioritize sustain investments through the asset strategies and the value-based modeling tools that support those strategies. Beginning with the prioritization cycle scheduled for fall 2016, BPA will also use those tools to establish the value of the sustain program that is on the margin. This is a change that will allow us to compare an expansion investment against the value of the sustain investments it might displace. This will enhance the portfolio rebalancing process that will now be conducted separately for Transmission and Power.
- Expansion investments will continue to be prioritized as described in the 2014 CIR materials while incorporating the changes described above. Capital costs for Facilities and Information Technology will initially be held to the identified capital levels. Within those levels, expansion investments will be nominated, assessed and prioritized. If investments are nominated that exceed those levels, they will be entered into the prioritization process for Transmission or Power as appropriate. That will put them in competition with other proposed investments in those categories.

These changes will allow BPA to continue and, in fact enhance, the value-based capital prioritization process that was launched with the previous CIR.

2.2.4 Proposed Capital Spending

BPA’s asset categories submitted various capital scenarios in late fall 2015 for long-term rates analysis. These scenarios lead to the following IPR/CIR “going-in” capital levels by asset category:

(Millions \$)	Actuals	Rate Case		Proposed CIR				Remaining CIR						
	2015	2016	2017	2017	2018	2019	FY 17-19 Total	2020	2021	2022	2023	2024	2025	2026
Asset Category Direct Spending														
Transmission Direct	559	422	372	372	317	311	1,000	456	473	482	441	421	417	432
Federal Hydro	159	224	230	236	258	281	775	306	331	338	344	351	358	365
Facilities	13	39	17	22	18	35	75	25	25	25	25	26	27	27
Security	1	6	8	8	6	8	22	7	7	7	7	5	6	6
Fleet	2	7	8	6	7	7	20	8	8	8	9	9	10	10
IT	31	33	25	25	25	25	75	3	12	5	7	15	15	15
Fish & Wildlife	21	55	31	45	51	44	139	38	34	29	29	36	37	37
Environment	6	5	5	5	6	6	17	6	6	6	6	6	6	6
Energy Efficiency	87	0	0	0	0	0	0	0	0	0	0	0	0	0
Direct Total	880	791	696	719	687	716	2,122	847	895	900	867	869	874	898
PFIA	1	15	15	15	15	15	45	15	15	15	15	15	15	15
Transmission Indirect	54	58	49	49	43	42	133	40	31	31	32	32	33	34
Corporate Overheads	50	58	49	49	43	42	133	40	31	31	32	32	33	34
AFUDC	52	63	39	50	32	30	111	30	31	31	30	30	30	30
Grand Total	1,037	985	848	881	819	846	2,545	973	1,004	1,009	977	979	986	1,011

2.3 What's Not Here

BPA's power and transmission rate case will set the level of rates applicable to sales and services for FY 2018 and FY 2019. The cost levels reviewed in this IPR and the input received through public comment will be considered by BPA prior to finalizing rates. Items addressed in the upcoming joint Power and Transmission rate case include:

- Loads and resources.
- Cash reserve levels.
- Rate design.
- Reimbursables.
- Revenue credits including net secondary sales/power purchases.
- Between business line spending levels.
- Rate levels.
- Billing determinants.

Program estimates are provided for the following but are not described in detail during the IPR process:

- Long-Term Contract Generating Projects.
- Operating Generation Settlement (Colville Settlement).
- Non-Operating Generation (Trojan Decommissioning and WNP-1 and 4 O&M).
- Power Services' Transmission Acquisition and Ancillary Services.
- Residential Exchange Program.
- Legacy and Reimbursable Energy Efficiency Development.

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3. POWER SERVICES

OVERVIEW

Power Services preliminary rate increase is 4 to 9 percent¹.

Power Services minimized proposed IPR expense spending level increases to \$73 million by:

- scrutinizing program costs and focusing on areas with the most flexibility, such as Power Services' internal operations
- funding the highest priorities and deferring or eliminating other programs, projects and contracts
- taking a hard look at staffing levels and assigning employees to focus on the highest priority work

Power is proposing to ramp up its capital program to \$300 million annually to unlock significant long-term benefits, such as increased power production, with minimal near-term rate impacts and slightly lower future rates.

Power Services' is responsible for marketing federal power and in particular firm power sold under the long-term Regional Dialogue power sales contracts. The cost of such power includes but is not limited to the cost of power (federal and non-federal), fish and wildlife and conservation. For FY 2018-19, Power is forecasting an increase in IPR expenses compared to the 2014 IPR. Some of the main areas that drive increases in Power Services' IPR costs are:

- **Bureau of Reclamation and Corps of Engineers O&M:** This proposal contains increases in Operation and Maintenance expenses to continue operating and maintaining the aging hydro projects in the FCRPS, as set out in their long-range plans.
- **Columbia Generating Station O&M:** This proposal contains increases in Operation and Maintenance expenses as set out in the long-range plan.
- **Fish and Wildlife:** Consistent with BPA's commitments in biological opinions and the Fish Accords, Fish and Wildlife costs are also increasing.

Internal operations costs are held flat compared to the BP-16 rate case. Trade-offs and risks associated with holding costs at BP-16 levels can be found in the Non-Generation Operations executive summary. By holding internal costs at the level in BP-16 rates, internal costs are not

¹ Significant rate uncertainty remains primarily due to uncertainty in gas and electricity price forecasts.

contributing to increases in IPR expenses, and hence will not be a factor in any rate increase associated with BP-18 rates.

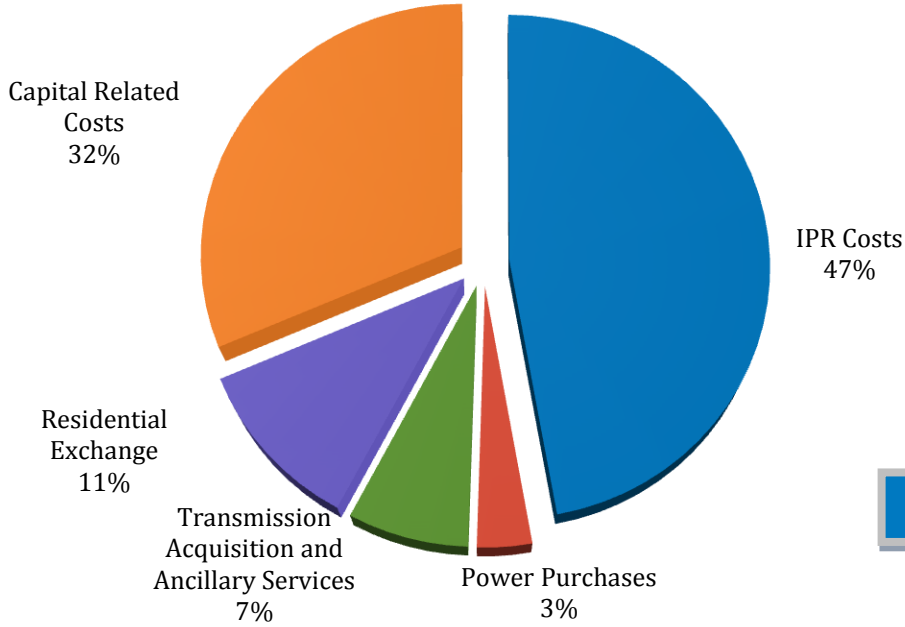
The following sections provide more information about these and other IPR programs and their proposed spending levels.

Other Non-IPR Costs: BPA is also projecting increased costs associated with items that are modeled in the rate case or are a function of past settlements or agreements such as:

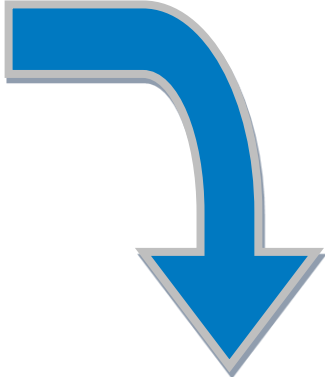
- **Residential Exchange Program:** This increase results from the cost schedule agreed to in the 2012 Residential Exchange Settlement.
- **Transmission Acquisition and Ancillary Services:** These costs are anticipated to be higher due to rising transmission costs for Southeast Idaho Load Service.

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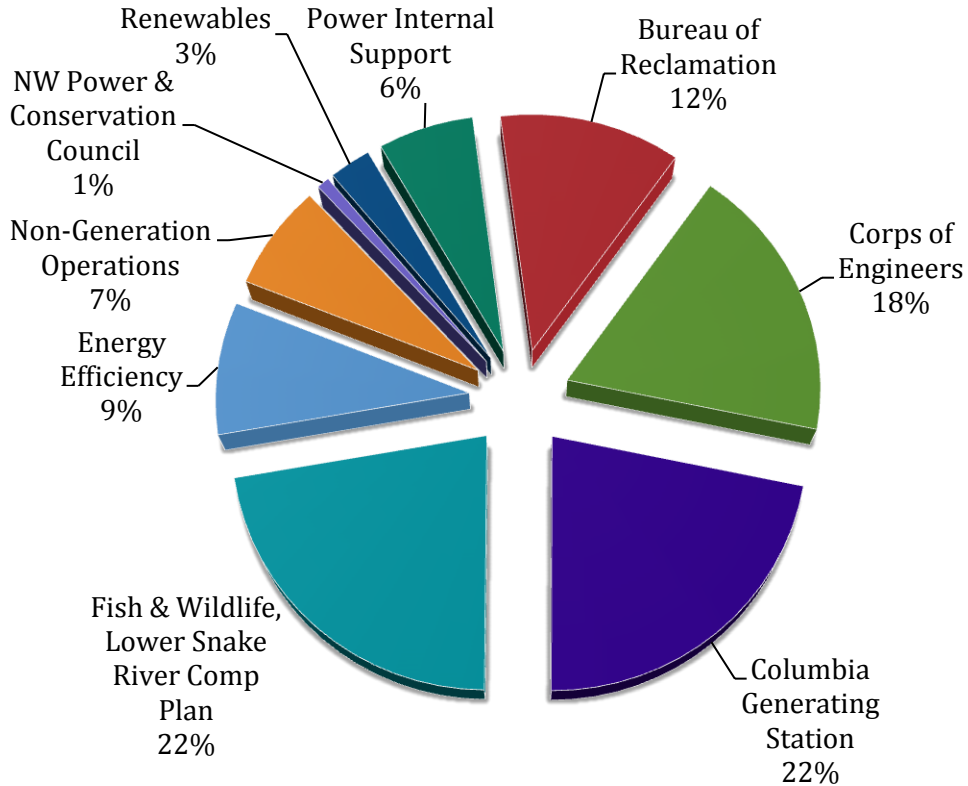
**Power Potential Revenue Requirement
FY 2018-19 Average**



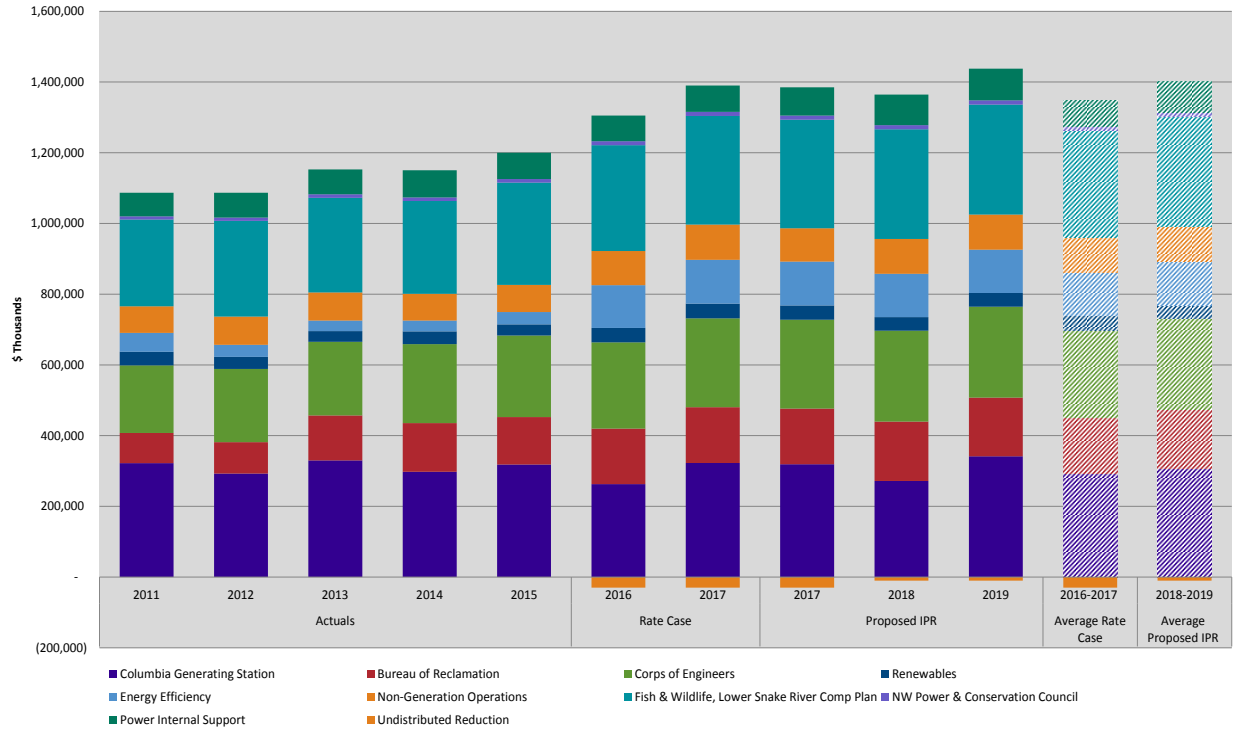
The revenue requirement includes costs outside the scope of the IPR.



FY 2018-19 Average: Proposed IPR Costs



Power Services Expense Summary

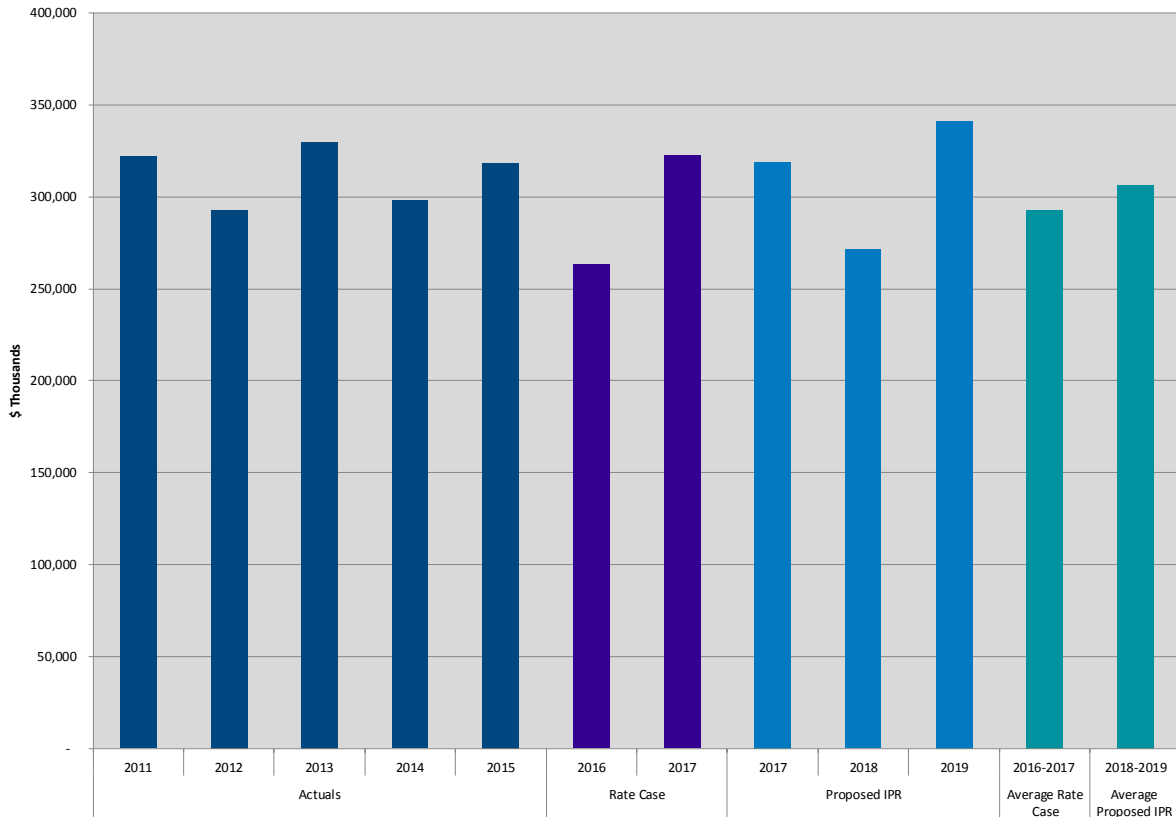
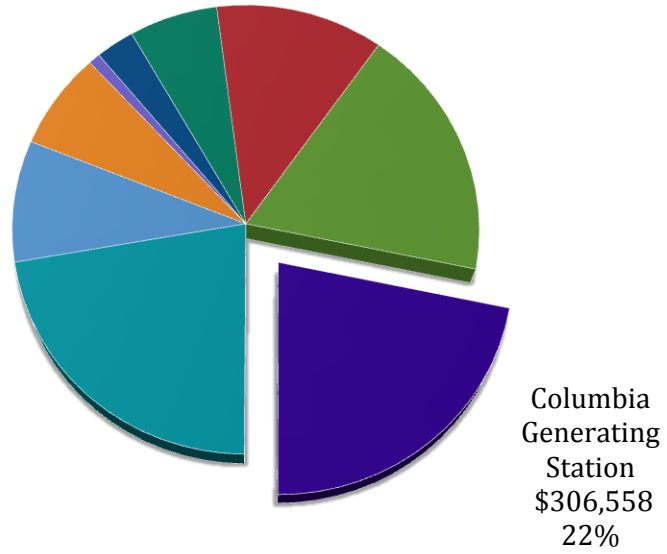


(\$Thousands)	Actuals	Rate Case		Proposed IPR		
	2015	2016	2017	2017	2018	2019
Costs Described in IPR						
Columbia Generating Station	318,231	262,948	322,473	319,053	271,669	341,447
Bureau of Reclamation	134,284	156,818	158,121	157,621	168,179	166,103
Corps of Engineers	230,742	243,885	250,981	250,981	256,957	256,957
Renewables	31,464	40,987	41,641	40,623	38,332	39,060
Energy Efficiency	34,625	121,044	124,060	124,060	122,592	122,512
Non-Generation Operations	77,154	96,542	99,836	94,158	98,298	99,249
Fish & Wildlife, Lower Snake River Comp Plan	289,108	299,303	306,949	306,949	310,483	311,002
NW Planning & Conservation Council	9,870	11,236	11,446	11,590	11,624	11,914
Power Internal Support	74,512	72,281	74,646	80,058	86,556	89,592
Undistributed Reduction	0	-29,700	-29,700	-29,700	-10,000	-10,000
Costs Described in IPR Total	1,199,990	1,275,343	1,360,454	1,355,393	1,354,689	1,427,837
Other Costs						
Reimbursable Energy Efficiency Development	8,218	15,000	7,000	8,000	8,000	8,000
Legacy	590	605	605	590	590	590
Long-Term Contract Generating Projects	26,074	22,303	17,034	16,007	16,143	17,235
Non-Operating Generation	1,126	1,600	1,863	1,482	1,500	1,534
Operating Generation Settlement	18,555	19,323	19,651	22,234	22,612	22,997
Power Services Transmission Acquisition	160,065	186,998	195,831	198,150	213,469	213,684
Residential Exchange & IOU Settlements	200,265	218,975	217,100	295,540	315,984	318,350
Other Costs Total	414,893	464,804	459,084	542,004	578,298	582,390
Grand Total	1,614,883	1,740,148	1,819,538	1,897,397	1,932,988	2,010,226

*Note: Effective FY 2016, Energy Efficiency reflects the EE capital-to-expense transition.

3.1 Columbia Generating Station

FY 2018-19 Average: Proposed IPR Costs



Program Details

(\$Thousands)	Actuals	Rate Case		Proposed IPR		
	2015	2016	2017	2017	2018	2019
Columbia Generating Station	318,231	262,948	322,473	319,053	271,669	341,447
Grand Total	318,231	262,948	322,473	319,053	271,669	341,447

Description, Purpose and Responsibilities

The Columbia Generating Station is a 1,120 net megawatt boiling water nuclear reactor located on the Department of Energy Hanford Site in Richland, Washington. It is owned and operated by Energy Northwest. CGS began operating in 1984 and is on a two-year refueling and maintenance outage cycle.



CGS operating and maintenance costs are included in the PF firm rates. BPA acquires 100 percent of CGS's generation and funds 100 percent of its costs plus directly funds the Decommissioning Trust Fund and Nuclear Electric Insurance Limited insurance premiums.

Goals

Energy Northwest's mission is to operate CGS in a safe, reliable and cost-effective manner and continues to work toward achieving technical and cost performance measures that rank within the top quartile of the industry. CGS is in the process of implementing its Value Optimization Project and other industry supported initiatives to reduce its production cost of power by increasing efficiency of overall operations.

Proposed IPR levels for FY 2018-19 will support continued operation and maintenance of CGS and are consistent with the spending forecast provided by the Energy Northwest FY 2017 Long-Range Plan for CGS. In FY 2019, CGS will have a refueling and maintenance outage, which results in higher costs for the year.

Changes from 2014 IPR

The earthquake and tidal wave that occurred in Japan in 2011 continue to have regulatory and financial impacts on nuclear plants in the United States. The Nuclear Regulatory Commission has been taking a closer look at U.S. nuclear plants and the impacts that natural disasters may have on operations and safety. CGS has included approximately \$35 million in its LRP for FY 2017 through 2019 (\$33 million in BPA fiscal years) to respond to the NRC mandates that have been and will be issued as a result of the events and damage that occurred at Fukushima. Full compliance with the

Fukushima mandates is estimated to be completed by the end of FY 2019 and total approximately \$78 million.

CGS is now operating under a 60-year NRC license. On May 23, 2012, the NRC approved the extension of CGS' operating license to 2043. This extension of operating life has allowed BPA to reduce contributions to the CGS Decommissioning Trust Fund as the required total contributions will be made over a longer period of time.

In 2012, BPA, DOE, Tennessee Valley Authority, the U.S. Enrichment Corporation and Energy Northwest signed agreements that, along with CGS's significant uranium inventory, minimize the impact of volatility in nuclear fuel market prices, thus minimizing fuel costs for CGS.

During CGS's last refueling outage in the spring of 2015, CGS completed a number of projects that increased the efficiency of existing equipment, which provided additional output to the grid.

New Projects/Programs

Each year CGS identifies, funds, and completes projects. Examples of noteworthy expense and capital projects for FY 2017-19 include the following:

Expense

- In-service inspection and non-destructive examination as required by NRC to inspect the reactor during the outage on a periodic basis.
- Inspection, repair and refurbishment of valves in the plant.
- Vessel services during the outage.
- Main turbine inspections.
- Main steam isolation valve inspection and refurbishment.

Capital

- Fukushima impacts due to the natural disaster that occurred in Japan in 2011.
- Cyber security program.
- Low pressure turbine rotor replacement.
- Control rod drive repair and refurbishment.

Risks of Operating at Proposed Spending Levels

The impacts of reductions to the CGS O&M expense forecasts would be reductions to long-term reliability and performance. Projects could be deferred and/or canceled. Deferred projects may cause a future bow wave of projects that would need to be done in a short period of time, probability of extended plant shutdowns may increase due to the long time to acquire replacement parts, and short-term CGS performance and reliability may be affected if human performance improvement initiatives cannot be completed.

Non-funded Items in Proposed Spending

- Forced outages if the plant needs to be taken offline for unexpected repairs.
- Undefined as well as future unknown regulatory mandates from the NRC.

Trade-offs

CGS O&M expenses are based on the LRP that is prepared by Energy Northwest. These costs are put through a rigorous review process prior to inclusion in the LRP. Projects are reviewed and ranked. Highest priority projects are included in the CGS spending levels. Lower priority projects may be deferred to future years or dropped from the list.

Firm vs Flexible

CGS costs are long-term fixed costs. The funding levels are based on the CGS LRP prepared by Energy Northwest. Energy Northwest determines the funding levels necessary to operate CGS in a safe, reliable and cost effective manner.

Integration of Capital and Expense

Within Energy Northwest's Business Planning and Risk Management Department, CGS has a rigorous internal review process that looks at current challenges and constraints to identify strategic decisions that need to be made in order to meet BPA's mission. This is a dynamic process that evaluates CGS capital and O&M expenses while working to meet the commitments made within the LRP. Most of the challenges faced by CGS are required to be addressed to allow continued operation. CGS capital continues to be debt financed in FY 2018-19.

Challenges/Constraints

Some of the challenges and risks that exist for FY 2018-19:

- Emergent equipment reliability issues;
- Increased length of the refueling outages;
- Unforeseen regulatory fees;
- Increased forced outages;
- Increases in employee benefits;
- Unknown regulatory mandates; and
- Plant aging and equipment obsolescence

3.2 Columbia Generating Station - Capital

Program Details

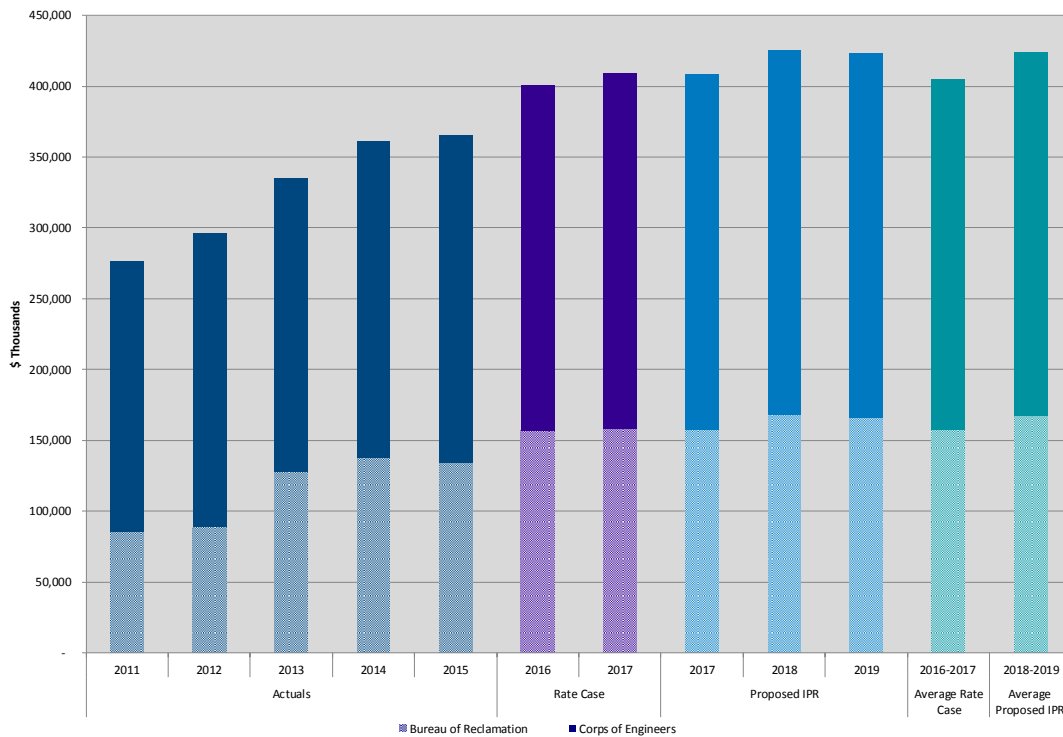
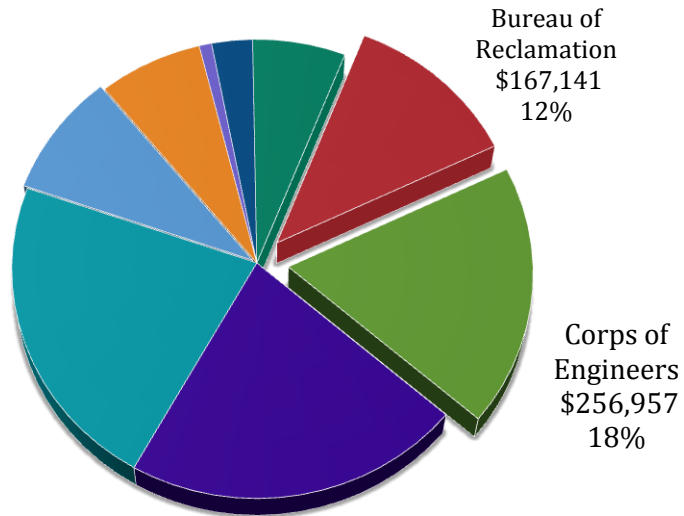
(\$Thousands)	Proposed Capital Spending Levels									
	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026
Columbia Generating Station	137,517	111,452	109,383	89,792	93,369	91,884	100,579	105,625	110,886	121,638
Grand Total	137,517	111,452	109,383	89,792	93,369	91,884	100,579	105,625	110,886	121,638

Energy Northwest's LRP for CGS includes proposed forecasts for capital investment requirements. These costs are put through a rigorous review process. Examples of projects included in these forecasts are projects required due to the Fukushima natural disaster that occurred in Japan in 2011, cyber security projects, and low pressure turbine rotor replacement. CGS capital continues to be debt financed.

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3.3 Bureau of Reclamation and Corps of Engineers

FY 2018-19 Average: Proposed IPR Costs

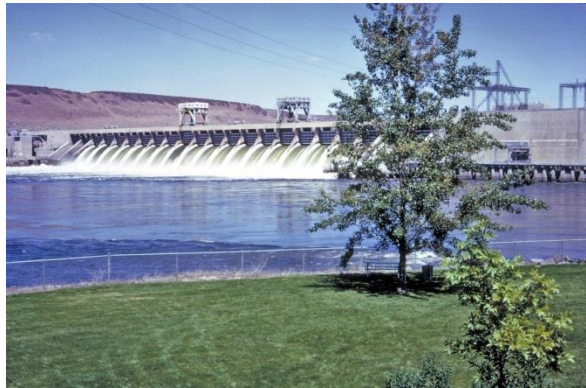


Program Details

(\$Thousands)	Actuals	Rate Case		Proposed IPR		
	2015	2016	2017	2017	2018	2019
Bureau of Reclamation	134,284	156,818	158,121	157,621	168,179	166,103
Corps of Engineers	230,742	243,885	250,981	250,981	256,957	256,957
Grand Total	365,026	400,703	409,102	408,602	425,136	423,060

Description, Purpose and Responsibilities

The FCRPS comprises 31 hydroelectric plants – 21 owned and operated by the U.S. Army Corps of Engineers and 10 by the Bureau of Reclamation. The FCRPS has an overall capacity of 22,060 megawatts, delivering energy worth nearly \$2 billion annually to the people of the Pacific Northwest, in addition to the value of avoided carbon dioxide emissions. Federal projects are multi-purpose, providing flood control, navigation, irrigation, fish and wildlife benefits, as well as power.



BPA, the Corps and Reclamation collaboratively develop spending level proposals to fund operations and routine maintenance activities, non-routine extraordinary maintenance projects, security and WECC/NERC reliability requirements, and fish and wildlife and cultural resources enhancement and mitigation activities at FCRPS facilities to provide low cost, reliable power. Our mission is to be a trusted steward of the FCRPS.

Goals

The goal is to maximize the value of every dollar spent by efficiently managing both firm and flexible costs while fulfilling our obligation to provide low cost reliable power and trustworthy stewardship of the FCRPS.

Near-Term

- Provide energy and capacity to meet our Regional Dialogue contract obligations (Tier 1) to our 130-plus publicly owned utility customers.
- Continue to ensure the FCRPS projects remain reliable and available during the Grand Coulee Third Power Plant overhauls, during which successive 805/690 MW units will be removed from service over a period of 10 to 12 years.
- Continue to address the Northwest’s cultural resources and fish and wildlife mitigation responsibilities.

Long-Term

- Operation of FCRPS power facilities meets availability and reliability standards in the most cost effective manner.
- Endangered Species Act, NW Power Act, National Environmental Policy Act, Fish Accords and other environmental responsibilities are met using a performance- and science-based approach.
- BPA, the Corps and Reclamation maximize the long-term value of FCRPS power assets through integrated asset management practices.

The proposed spending level request of about \$425 million per year for the Corps and Reclamation is recommended to adequately address the program needs described below. Although some risk is already being assumed by deferring lower priority projects to future rate periods, this funding level will provide the Corps and Reclamation the ability to perform critical maintenance, regulatory and mitigation activities to ensure safe and reliable operations of FCRPS hydro facilities.

Continuing Issues Identified in the 2014 IPR

Long-term forced outages continue to be a concern for the FCRPS. For instance, BPA has identified a design flaw in the Kaplan blade linkage/pin components on one family of generating units that has led to multiple forced outages. A mitigation plan was developed and implemented, providing an interim repair plan: either repairing the damaged unit to full adjustable blade functionality or blocking the blades, depending on the operational criticality of the unit. In addition, Bonneville Powerhouse 2, Grand Coulee, and John Day have all experienced forced outages, although unrelated, that further contribute to reductions in reliability and system performance. These failures have contributed to a forced outage factor for the FCRPS that is about 40 percent higher than the industry average and are a significant risk to reliable system performance; they require non-routine extraordinary maintenance funds to address the problems. Generally, non-routine maintenance funding pressures have increased as equipment continues to age, and work originally planned for previous rate periods was deferred to limit near term pressure on rates. Given the age and condition of the system, BPA expects an increasing need for non-routine extraordinary funding in the future.

Reliability compliance activities associated with WECC/NERC have continued to increase. New compliance standards continue to be issued and revisions to existing standards occur frequently. The new standards and revisions require an increasing amount of labor to implement and support them. The requirements for collaboration and coordination between generation, transmission, balancing authority, and other electrical power entities have increased substantially, not only for compliance personnel but also for management and various technical elements at our facilities. This combined with increasing cyber and physical security requirements, driven by regulation in those areas, will result in significant increases in all critical cyber systems, such as powerhouse control systems, which are required to be re-certified every three years. Highly skilled personnel are needed to stay current on the standards, implement the standards, and perform the required testing/reporting/certification.

By the end of FY 2016, Reclamation will have completed the hiring of additional staff identified in the 2012 IPR. The staffing reflects recommendations received from a third-party peer review assessing industry best practices, and includes staff for the project management program, O&M engineering support, and the safety program. As work activities have dramatically increased at Grand Coulee due to new reliability requirements, routine and non-routine maintenance needs, and ongoing capital improvements, staffing levels have not increased in proportion and work crews are spread too thin to support the additional activities.

O&M requirements for assets associated with CRFM-funded fish passage investments at Corps facilities that transitioned in 2014 have continued. These critical assets were built with appropriated capital funds provided by the CRFM program, and require annual funding for ongoing operations and maintenance. These routine O&M activities have been incorporated into the annual spending levels for the Corps of Engineers.

Lastly, about 60 percent of the hydropower O&M program spending levels is for employee salaries and benefits, the vast majority being trades and crafts (T&C) staff. T&C salaries are set based on a regional survey of the hydropower industry, which can lead to annual increases ranging from 1 percent to 5 percent depending on the regional economic landscape.

To support the efforts described above, the Corps and Reclamation are requesting combined O&M spending levels of about \$425 million per year in the FY 2018-19 rate period.

New Requirements

The condition of many critical FCRPS assets has degraded to a point where increased action must be taken to address reliability and performance issues. Continued rate pressures to reduce O&M spending levels have come at a cost of deferred non-routine maintenance work, resulting in a significant backlog of work that must be addressed. Therefore, long-term planning efforts have been made to identify non-routine maintenance needs as far in advance as possible and federal partners have embarked on additional efforts to capture the value of each project in order to optimize the limited funds available. Since the 2014 IPR, several new non-routine projects have been identified as priorities for the O&M program. These include several projects at Grand Coulee such as fixed wheel gate refurbishment at the Third Powerplant, ring seal gates refurbishment, and spillway drum gates overhaul; Minidoka turbine rehabilitation, cultural resources work at Lake Roosevelt, Unit 1 refurbishment and intake gate rehabilitation at Lower Monumental, and Bonneville Powerhouse 2 forebay dredging. These projects have largely been accommodated by canceling or deferring lower priority non-routine projects.

Operating at Proposed Funding Levels and Associated Risks

The proposed funding levels for the Corps and Reclamation represent the minimum spending levels necessary for maintaining the hydro system's safe and reliable performance during the major overhaul at Grand Coulee, as well as the expense for the Grand Coulee work itself. In order to keep the rest of the FCRPS generating units available to reduce the loss of 805 MW from the system during the overhaul of the

first three units, the Corps and Reclamation need to be appropriately staffed and have sufficient resources to address the operations, routine maintenance, and non-routine extraordinary maintenance required across the system.

The Grand Coulee TPP overhaul is the most significant single critical action for maintaining the value of the hydro system. Because of its age and condition, the equipment in the facility requires a significant amount of non-routine extraordinary maintenance funding to ensure its bridge to long-term reliable performance. These costs are significant, but not funding this work would have a much larger impact on Grand Coulee's ability to provide current and long-term value to the region.

Across FCRPS generating facilities, similar age and equipment conditions and risks as those described for Grand Coulee exist. The Corps and Reclamation have identified non-routine extraordinary expense needs during the FY 2017-19 period. The most significant of those needs that are included in the spending level request are listed below:

- Repairs to units at Bonneville Second Powerhouse thrust collar and thrust runner (among other issues, these flaws contributed to unit 11's long-term forced outage).
- Grand Coulee G1-18 penstock and draft tube coating repairs.
- Grand Coulee Third Powerplant and Hungry Horse cavitation repairs.
- BLH family of turbines at John Day and the Lower Snake plants which have high potential for blade linkage failures; several of these units have experienced failures.
- Spillway gate rehabilitation and maintenance at Chief Joseph, The Dalles, McNary, Bonneville, and throughout the Willamette Valley.
- Grand Coulee Dam drum gate overhaul.
- Grand Coulee Dam ring seal gate refurbishment.
- Keys Pump Generating Plant coaster, reverse flow, bypass valve and piping.
- Hungry Horse transformer fire protection upgrade.
- Monolith joint repairs at Chief Joseph, John Day, and Dworshak.
- Headgate refurbishment at McNary.
- Minidoka security evaluation and modernization.
- Additional Corps HQ-mandated maintenance requirements, including turbine integrity inspections at all facilities that were developed after the catastrophic failure at the Sayano-Shushenskaya hydro plant.

The Corps, Reclamation, and BPA are managing these growing non-routine extraordinary maintenance needs within the proposed funding level, but there will be ongoing tension between O&M expenditure rates and system reliability and performance.

The proposed IPR FY 2018-19 spending levels are also based on required performance of routine system operations and maintenance activities, as well as addressing important requirements such as:

- Reliability requirements for WECC/NERC compliance.
- Accomplishing critical non-routine maintenance.
- Dam safety and employee safety requirements.

- Stewardship/mitigation requirements for cultural resources.
- Maintaining qualified staff at all facilities, including power plant training programs and an engineering intern program.

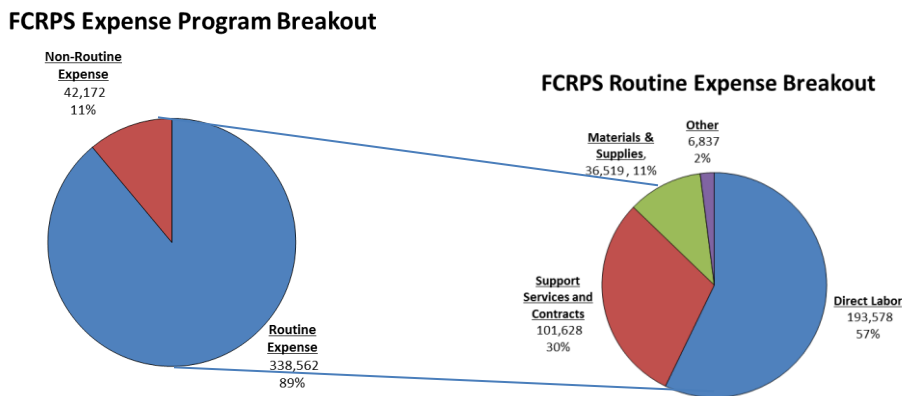
The proposed spending levels to meet the needs described above are a lean approach to funding. They only represent funds necessary for currently planned activities; there are no remaining funds for additional work activities identified within the rate period.

Firm vs Flexible

The Corps and Reclamation use a baseline spending level process to develop program requirements for a routine O&M program. These baseline spending levels have outlined a minimum effort to successfully and consistently maintain the facilities for acceptable reliable performance. The largest portion of O&M spending levels is labor, with the rest devoted to contract support (which includes security and other support services, fish and wildlife and cultural resources mitigation), materials and supplies required for operations and maintenance, and “other” costs such as utilities, travel, and equipment rental.

Only a very small portion of O&M, represented in the “other” category, is flexible in the short-term and can be changed quickly. About 40 percent is contained in the “support services and contracts” and “materials and supplies” categories and are somewhat flexible in the mid-term. The other 60 percent is devoted to direct labor costs for the federal labor force and are fixed.

FY 2015 Actual O&M Expense Costs by Category



Capital and Expense Program Integration

BPA, the Corps, and Reclamation have initiated a long-term planning effort to identify future funding needs and opportunities for the O&M program across the FCRPS. This effort will be aligned with long-term capital investment plans to ensure integration and optimization of these programs. It is unknown what the results of this analysis will suggest about the optimal program levels for long-term O&M funding. Results from this effort will be made available when complete, and may include specific initiatives to help manage the O&M program in the most cost-effective manner.

Trade-offs and Non-funded Items

The Corps and Reclamation are generally able to fund critical activities at the proposed FY 2018-19 program spending levels. However, there are some areas that were left unfunded due to uncertainty and to minimize the impact on power rates:

- Multiple needed non-routine projects have been deferred into future rate periods in order to keep spending level amounts at the proposed levels. Although these items are not the highest priority projects, deferring them does introduce increased risk, both to cost and reliability.
- Potential changes in security and cyber security requirements (re: Federal Information Security Management Act) are not clearly defined at this point, but generally become more severe and require more resources as requirements are defined. WECC/NERC requirements for cyber security are increasing dramatically. Cyber vulnerabilities of power plants are an issue of great concern in the Department of Defense, whose standards the Corps must comply with. The Corps has recently been mandated to perform cyber security assessments for both power and joint assets, which may result in additional investment needs. This is an issue for Reclamation as well, particularly with Grand Coulee having national icon status in the Department of Interior.
- The Corps recently determined that Environmental Impact Statements at their facilities require updates. These updates may cost up to several million dollars over several years. This need is not included in the spending level request.
- Ongoing environmental assessments at Big Cliff may result in extensive remediation requirements, which are unknown and therefore not included in the spending level request.
- Corps and Reclamation joint-funded facilities need additional work. Fish passage facilities, hatcheries and joint features at the dams are the same age and condition as the power facilities and in need of maintenance and investment. Reclamation and the Corps must get matching appropriations for these items, which may prove challenging with the difficult appropriation environment.
- Columbia River Fish Mitigation funding will no longer be available, which may put pressure on future spending as critical fish passage needs lose an important source of funding.

3.4 Bureau of Reclamation and Corps of Engineers - Capital

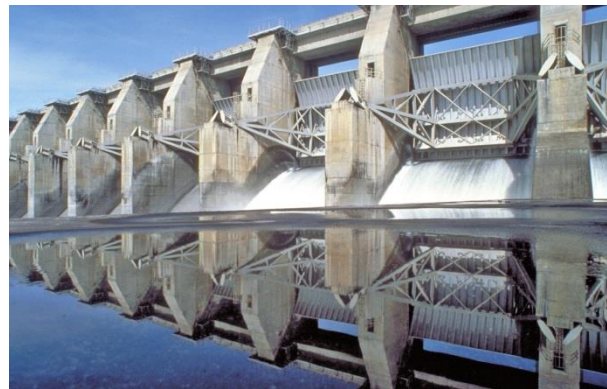
Program Details

(\$Thousands)	Actuals	Rate Case		Proposed CIR			FY 17- 19 Total
	2015	2016	2017	2017	2018	2019	
Asset Category Direct Spending							
Corps of Engineers	131,692.2	143,246.0	141,893.0	168,238.0	164,769.0	145,180.0	478,187.0
Bureau of Reclamation	27,643.7	80,927.0	88,325.0	67,359.0	93,200.0	135,957.0	296,516.0
Direct Total	159,335.8	224,173.0	230,218.0	235,597.0	257,969.0	281,137.0	774,703.0
AFUDC	7,559.3	16,617.4	11,690.2	10,660.2	6,795.0	6,735.0	24,190.2
Grand Total	166,895.1	240,790.4	241,908.2	246,257.2	264,764.0	287,872.0	798,893.2

(\$Thousands)	Remaining CIR						
	2020	2021	2022	2023	2024	2025	2026
Asset Category Direct Spending							
Corps of Engineers	126,700.0	175,790.0	176,844.0	186,708.0	212,114.0	220,670.0	237,512.0
Bureau of Reclamation	179,508.0	155,272.0	160,806.0	157,661.0	139,108.0	137,541.0	127,828.0
Direct Total	306,208.0	331,062.0	337,650.0	344,369.0	351,222.0	358,211.0	365,340.0
AFUDC	7,167.0	7,590.0	7,851.0	7,854.0	7,709.0	7,479.0	7,202.0
Grand Total	313,375.0	338,652.0	345,501.0	352,223.0	358,931.0	365,690.0	372,542.0

Description, Purpose and Responsibilities

With an installed capacity of 22,060 megawatts, the FCRPS is the largest hydropower system in the United States and second largest in North America. In an average water year, it produces 76 million megawatt-hours of electricity, displacing fossil-fired generation emitting in excess of 40 million tons of carbon dioxide.



The FCRPS hydro projects are multi-purpose, providing flood control, navigation, irrigation, fish and wildlife benefits, as well as power. Energy generated by the FCRPS over the last five years was worth \$1.9 billion per year on average valued at the Mid-C spot market index with an additional avoided carbon dioxide emissions value of \$1.4 billion per year based on a \$35 per ton levelized social cost of carbon emissions.

The 14 main stem Columbia and headwater/Lower Snake plants produce 96 percent of the energy and capacity for the system. Five plants – Grand Coulee, McNary, Chief Joseph, John Day and Dworshak – are considered particularly critical to the power system based on the significant operational impact of generating unit outages at these facilities. The program outlined in the below

strategy targets a significant portion of costs at these five plants to improve condition and reliability.

Capital Investment Strategy

Similar to the 2014 CIR capital investment recommendation, the 2017-30 Hydro Asset Strategy recommends a \$300 million per year capital investment program (in 2016 dollars.) By 2028, the increased investment relative to the 2014 CIR levels is expected to reverse the declining trend in asset condition and reduce loss generation risk by 1,000 GWh per year with effectively no impact on the PF rate.

The investment strategy uses a lifecycle cost minimization approach to identify the optimal time for asset replacement or refurbishment. Condition and associated probabilities of failure are forecast for over 5,500 assets. In each year for a 50 year study period, the present value cost of deferring investment is weighed against the present value cost of replacement or refurbishment for each of the 5,500 assets. Deferral costs are comprised of the increase in risk associated with delaying replacement for one year as well as any foregone efficiency gains that would result from replacement. The sum of the present value of risk, lost efficiency opportunity and replacement cost results in the total cost curve. Optimal replacement occurs at the minimum of this curve and is illustrated in Figure 1. Assets at or past their calculated optimal replacement dates are prioritized based on their deferral cost in the event that the optimal replacement need exceeds capital spending level constraints. Thus, assets posing high and increasing risk are prioritized over assets with flatter risk profiles.

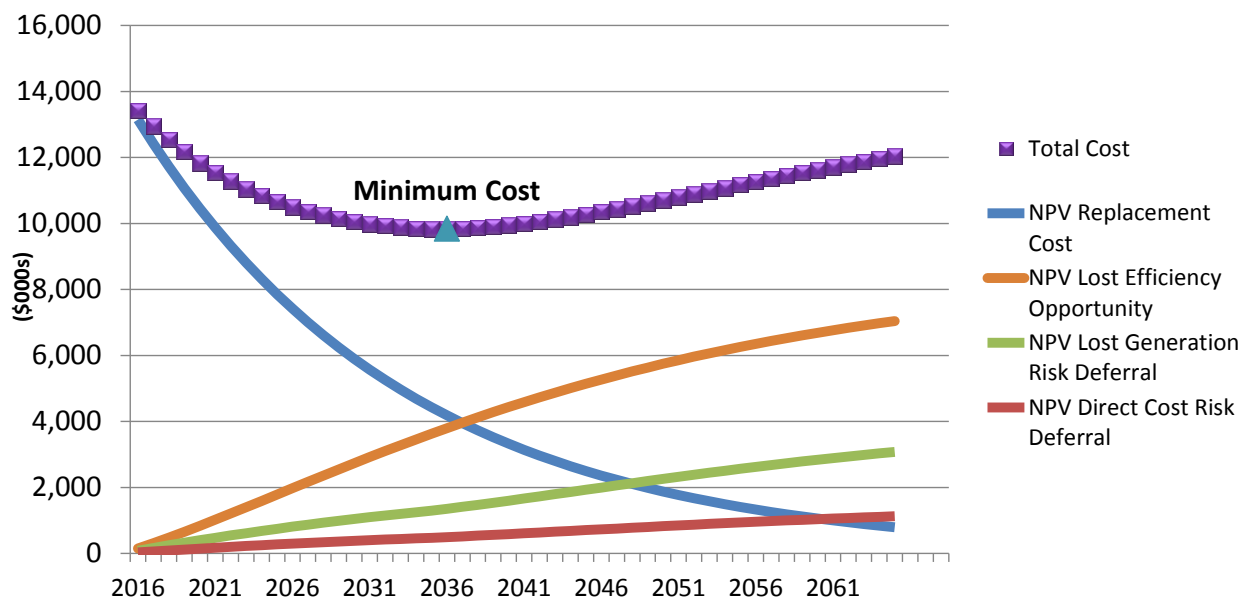


Figure 3.5.1. Asset Optimal Replacement Date

The FCRPS 2017- 30 Hydro Asset Strategy identifies significant benefits in increasing annual capital investment above the \$200 million annual investment level ultimately approved in the 2014 CIR. Figure 2 shows incremental benefits of increased capital funding levels.

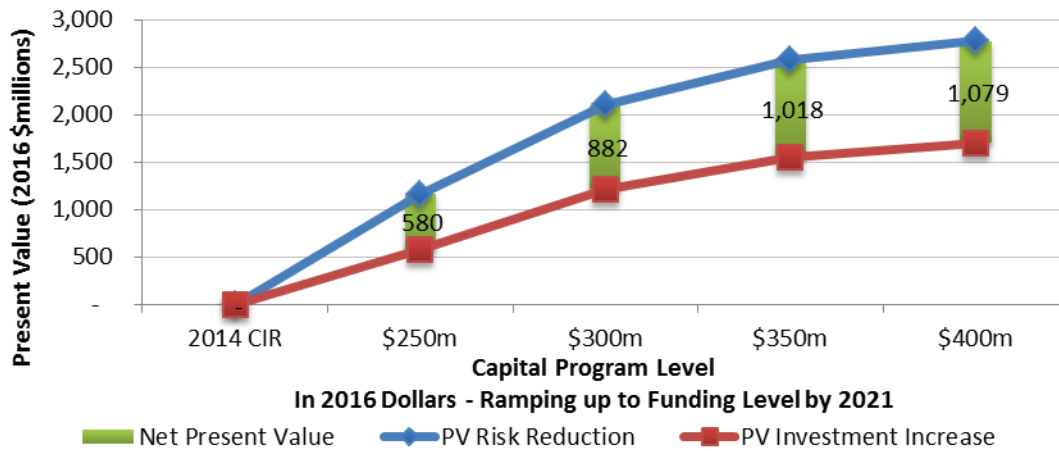


Figure 3.5.1. 50-Year Present Value (8% Discount Rate)

The net present value of increased investment grows fairly dramatically up to a \$300 million per year capital investment level (2016 dollars), after which increases in net present value begin to diminish. Higher investment levels also carry increased execution risks and outage requirements, the costs of which are not fully accounted for in this strategy. As a result, the \$300 million program is identified as the recommended level of investment in the hydro system.

Condition Impacts of the Strategy

At the 2014 CIR investment level of \$200 million per year, the condition of the system was expected to continue to decline for all operational classes and create a bow wave of needed investment. By 2028, the percentage of equipment in marginal and poor condition is expected to grow from 25 percent to 40 percent and remain at that level into the future. Contrarily, this percentage is projected to only grow to 30 percent by 2028 with a \$300 million investment level and actually decline to 28 percent by 2045. The \$300 million recommended investment level reverses the declining condition trend as the increased level of reinvestment catches up with the bow wave of investment need. Figure 3 shows aggregate condition forecasts for the Main Stem Columbia and Headwater/Lower Snake projects.

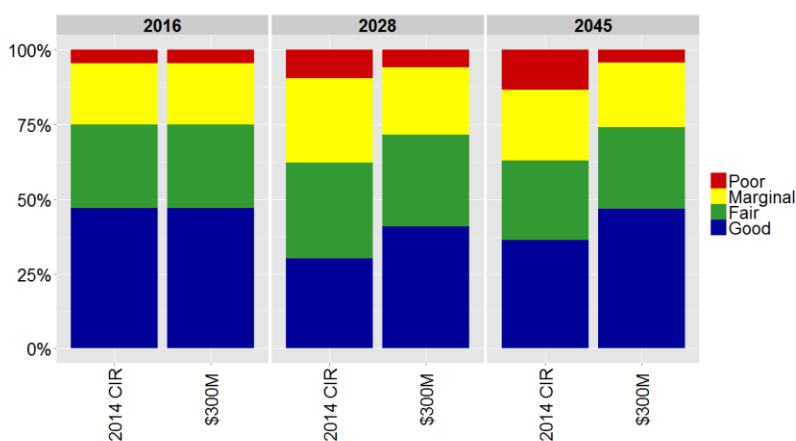


Figure 3.5.2. Condition of Main Stem Columbia and Headwater/Lower Snake Projects

Risk Impacts of the \$300 Million Strategy

Both investment levels address key risks at Grand Coulee and McNary dams, resulting in about a 50 percent reduction in total lost generation risk in the 2020s from today's levels. However, due to the extensive work planned at these plants, the \$200 million program leaves sparse remaining funding for critical investments at the remaining 29 plants in the FCRPS. A \$300 million investment level provides a more adequate level of funding to address critical equipment outside of Grand Coulee and McNary and is forecast to result in an incremental 1,000 GWh of generation per year in an average water year compared to a \$200 million investment level. Figure 4 illustrates the generation impacts of given program levels compared to 2014 CIR investment levels.

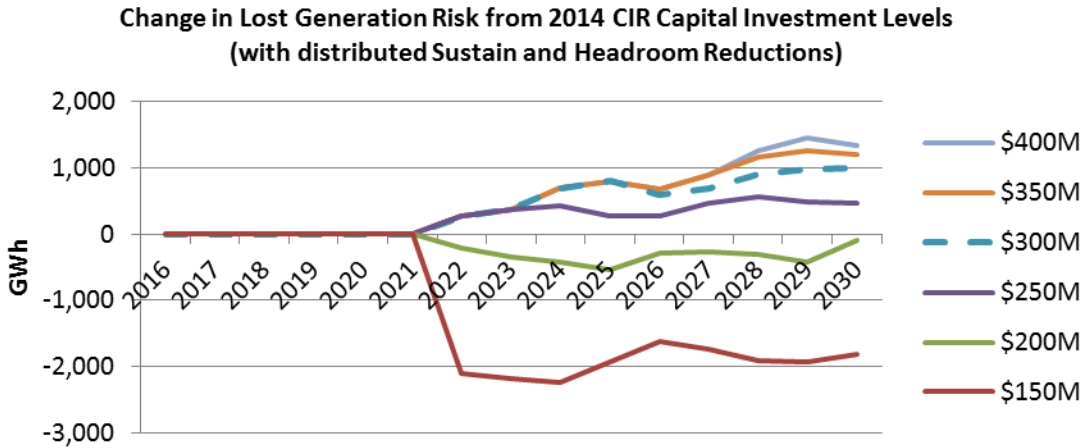


Figure 3.5.3. Lost Generation Risk

In addition to the financial benefits of the higher investment level, the number of assets that pose a high safety or environmental risk are significantly reduced. There are currently 89 assets that pose a high safety risk and 94 assets that pose a high environmental risk based on their condition and associated probability of failure. By 2028, the number of assets in the high safety risk category is expected to grow to 105 at 2014 CIR Investment levels while the number of high environmental risk assets is expected to remain relatively unchanged at 93. At the recommended program level, these numbers are expected to be reduced by more than half to 51 high safety risk assets and 42 high environmental risk assets.

Rate Impacts of the Strategy

A long-term analysis was conducted to study potential impacts to the PF rate levels of the approximately \$200 million per year 2014 CIR program against the \$300 million program. No other changes were made to other asset categories. The study suggested that power rates could be slightly lower in 2028 with a \$300 million per year capital program level due to higher unit availability and slightly reduced non-routine expense relative to the 2014 CIR program. Additionally, the 2018-19 PF Rate is forecast to be \$0.03 higher at the \$300 million level due to the majority of Plant in Service associated with the increased investment falling after 2020.

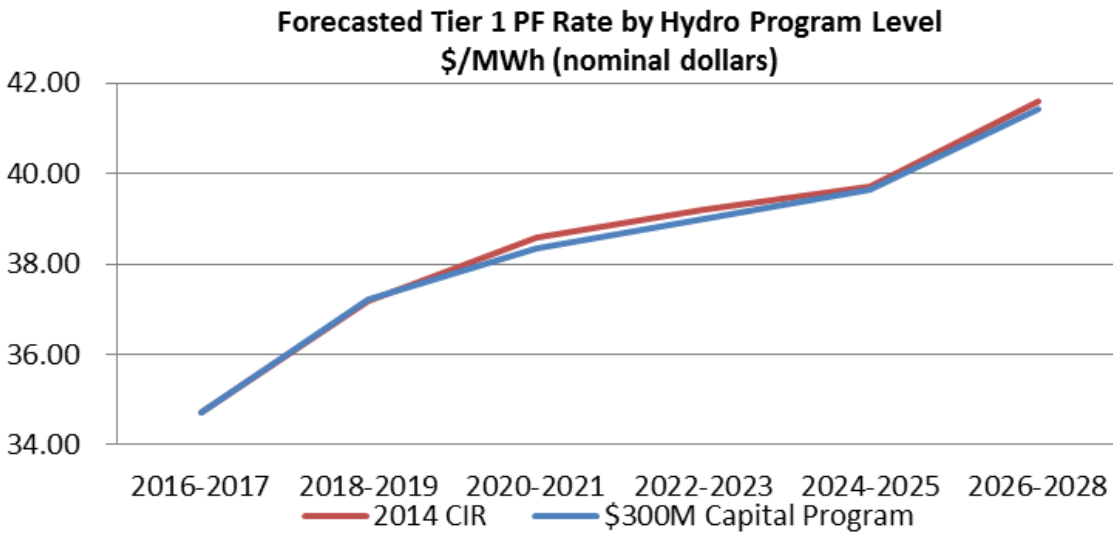


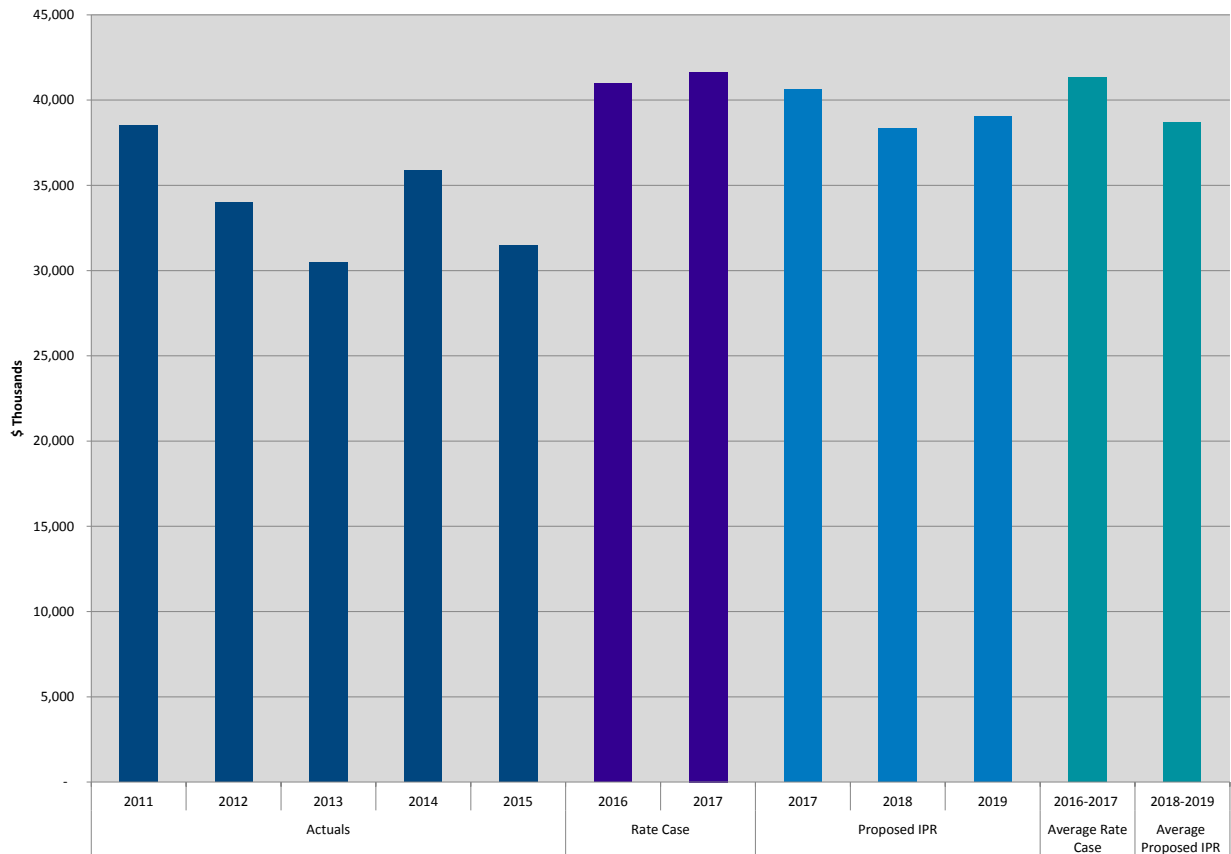
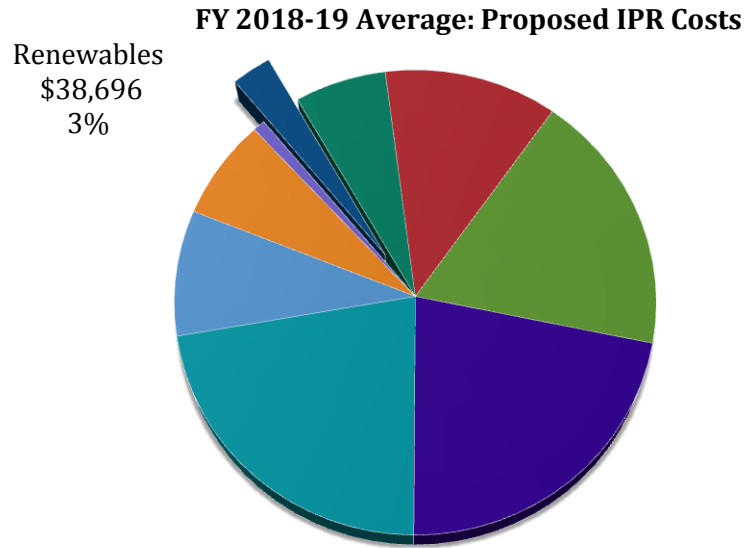
Figure 3.5.4. Rate Impacts

Sensitivity Analyses

Various sensitivities were performed to determine the impacts of the assumptions used in the model. In even the most conservative cases, the model would suggest that there are positive benefits in investing \$300 million per year through the late 2020s. Even assuming a long-term real levelized energy price of \$20, no value for capacity and no benefits for avoided carbon emissions, the modeling still finds it optimal to investment roughly \$300 million through 2025 at an 8 percent discount rate and through 2034 at a 6 percent discount rate.

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3.5 Renewables



Program Details

(\$Thousands)	Actuals	Rate Case		Proposed IPR		
	2015	2016	2017	2017	2018	2019
Renewables	31,464	40,987	41,641	40,623	38,332	39,060
Grand Total	31,464	40,987	41,641	40,623	38,332	39,060

Description, Purpose and Responsibilities

In the 2007 Long-Term Regional Dialogue Record of Decision (ROD), BPA proposed to base its renewables program goal on the Northwest Power and Conservation Council's forecast of renewable generation and public power's share of regional load growth. The ROD calls for BPA to assess public power's renewable acquisitions and acquisition plans, regional load growth and revisions to the Council's Plan to determine if the target is being met. BPA is proposing to continue this strategy through the FY 2018-19 rate period. Using the Seventh Power Plan and public power's resource plans, BPA has concluded that consumer-owned utilities are likely to purchase sufficient renewables to meet BPA's goal through FY 2019.



Goals

BPA's goal for renewable resources is to meet existing contract obligations while seeking opportunities to reduce costs and maintain existing program functions.

Strategy

- Continue to purchase the output of six wind projects currently under power purchase agreements.
- Maintain the solar and wind monitoring networks (used in forecasting).
- Cover fees/costs associated with the management of Tier 1 Renewable Energy Certificates.

Changes from the 2014 IPR

Renewable power purchase expenses have been updated to reflect revisions to contract purchase prices.

The funding for renewable resource development has been reduced to zero from \$4 million per year. This funding would have covered future resource development activities identified during the rate period needed to meet the renewables goal and other resource development needs. In the

2014 IPR, BPA used \$1.6 million per year of the \$4 million identified for renewable resource development funding to fund Demand Response Advanced Demonstrations in FY 2016-17.

New Programs/Projects

No new programs or projects are proposed.

Risk and Impact of Operating at Proposed Spending

BPA has eliminated funding for new renewable resource development. This action brings the Renewables Program to about \$1.5 million, on average, below 2014 IPR. The renewable resource development funding covered resource development activities, including Power Services' commitment to demand response advanced demonstrations. With the knowledge gained from several successful demand response demonstration projects in the industrial and commercial sectors during FY 2015-16, BPA is developing the steps needed to accomplish full commercialization of demand response. Though the demonstrations are ending, BPA is taking steps to ensure that demand response will be a viable operational option for solving some of the capacity constraints on the BPA system.

Funds for resource development activities such as infrastructure development, generation options, pilot programs or permitting, and for pre-energization costs of resource development, which either help meet BPA's stated renewable generation goal, reduce Tier 1 exposure to capacity risks, or hedge risks to transfer service due to changes in the balancing authority status of the transmission provider, would only be available in the BP-18 rate period if funded by the program areas that would benefit.

In the event of a windier than forecast year, unused resource development funds would not be available to cover incremental wind production costs at the six wind projects.

If consumer-owned utilities change their plans on renewable resource development, BPA is not proposing any funding that could meet the renewable program goal in the Long-Term Regional Dialogue ROD.

Trade-offs

If BPA determines that renewable resource development activities are necessary, such activities during the BP-18 rate period would need to be funded from financial reserves. Also in the event of a windier than forecast year, any unused resource development funds would not be available to cover incremental wind production costs at the six wind projects. Any overruns due to more than average wind output will likely come from BPA financial reserves.

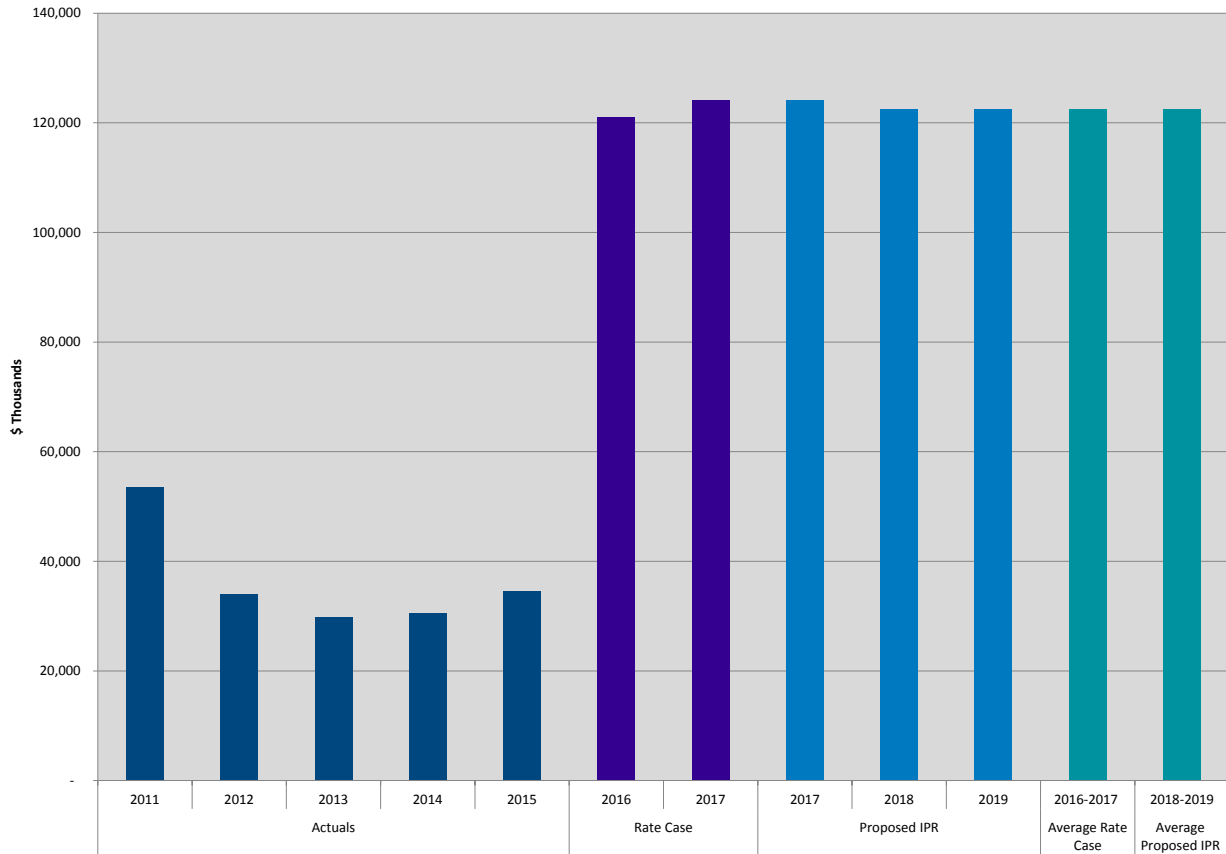
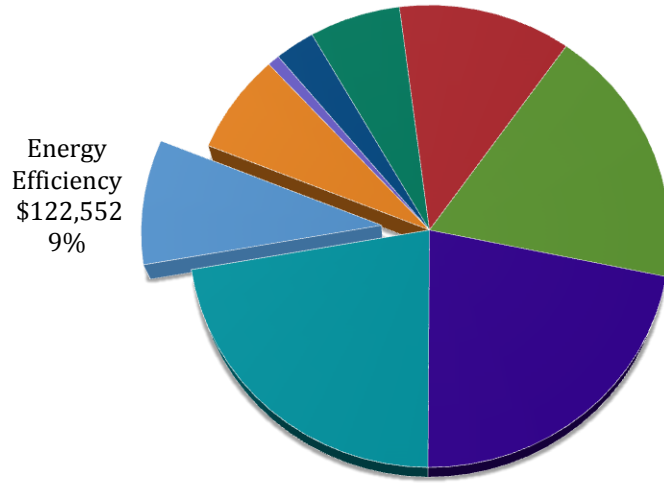
Firm vs Flexible

The Renewables Program is 99 percent long-term fixed costs and 1 percent mid-term flexible costs. The long-term fixed costs are associated with existing wind power purchase contract obligations at \$38.4 million per year. The flexible costs cover support services at \$0.3 million annually.

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3.6 Energy Efficiency

FY 2018-19 Average: Proposed IPR Costs



*Note: Effective FY 2016, Energy Efficiency reflects the EE capital-to-expense transition.

Program Details

(\$Thousands)	Actuals	Rate Case		Proposed IPR		
	2015	2016	2017	2017	2018	2019
Conservation Infrastructure	15,756	101,932	104,702	27,534	27,149	27,283
Conservation Purchases	0	0	0	77,360	76,700	76,700
Demand Response & Smart Grid	893	1,245	1,245	893	856	854
Low-income Energy Efficiency	5,248	5,336	5,422	5,422	5,523	5,627
Market Transformation	12,728	12,531	12,691	12,851	12,364	12,049
Grand Total	34,625	121,044	124,060	124,060	122,592	122,512

*Note: Effective FY 2016, Energy Efficiency reflects the EE capital-to-expense transition.

Description, Purpose and Responsibilities

BPA's Energy Efficiency program promotes the efficient use of energy in the Pacific Northwest and BPA's acquisition of conservation. Energy Efficiency staff administers BPA's conservation acquisition contracts and produces and delivers energy efficiency programs, products, and services.

When acquiring resources to meet load obligations, the Northwest Power Act requires the Administrator to first consider and acquire cost-effective conservation consistent with the Northwest Power and Conservation Council's most recent Power Plan.

Energy Efficiency proposed spending includes funding for regional infrastructure (research, oversight, compliance, market support services, regional planning and market transformation), incentive funding for energy savings acquisition and low income grants to states and tribes.

Beginning in FY 2016, Energy Efficiency transitioned its funding from capital to expense at the request of customers to reduce long-term interest costs and provide BPA with greater flexibility in its borrowing authority. This resulted in more than \$1.3 billion in projected interest savings through 2028. BPA's Energy Efficiency effort is now 100 percent expense funded.

BPA is committed to acquire Public Power's share of the Council's Seventh Power Plan goals for FY 2018-19. The proposed spending is forecast to allow BPA to achieve this commitment.

The Focus 2028 process covers ideas and proposals that could result in changes to BPA's Energy Efficiency program, which in turn may affect BPA's share of the Council's energy efficiency goals and related spending levels. That process is ongoing and, as such, the spending levels forecast reflect Energy Efficiency's program in its current state.

Goals

Along with meeting Public Power's share of energy savings as aligned with the Council's Power Plan, BPA's Long-Term Regional Dialogue Policy includes a commitment to pursue all cost-effective conservation in the service territories of those public utilities served by BPA. The savings are acquired in partnership with public utilities at the lowest cost to BPA. Conservation is achieved through programmatic efforts, momentum savings and market transformation.

Conservation Infrastructure

Program Infrastructure Support: This funding focuses on developing programs and policies to encourage conservation, and improves the region's ability to achieve energy efficiency. Specifically, Conservation Infrastructure funds support for a number of areas including:

- The development and execution of regional programs.
- Engagement with customers and other stakeholders.
- Implementation of trade ally education and support efforts.
- Market research and evaluation to ensure resource reliability.
- Engineering support for project implementation.
- Innovation of new, more efficient technologies.

Momentum Savings: Momentum savings quantify energy efficiency occurring through codes and standards as well as savings created outside of utility programs or market transformation efforts. Momentum savings, which have also been referred to as “naturally occurring” savings, are savings that are documented and substantiated, but do not receive any incentives from a utility or BPA. For instance, thousands of compact fluorescent light bulbs are purchased and installed by retail consumers in the region without the use of utility incentives, making these efforts extremely cost effective to count toward public power's target. A portion of the Conservation Infrastructure expense proposed spending levels covers the necessary research, data collection and evaluation to capture these savings. Part of funding to the Northwest Energy Efficiency Alliance also helps with this initiative.

Conservation Purchases

BPA provides incentives to support the acquisition of energy efficiency in two major categories: Energy Efficiency Incentives and Energy Smart Reserved Power. EEI represents the vast majority of conservation purchase funds and is allocated to utilities based on load share. These funds are used by utilities to provide incentives to their end-use consumers to support energy efficiency projects in their service territories. ESRP supports efficiency improvements to sites that receive power directly from the FCRPS (such as irrigation districts and fish hatcheries.) These projects offer very low cost energy savings, and often have a water conservation benefit that keeps more water in the river and allows for additional generation.

Demand Response

Demand Response helps BPA and utilities better manage the availability in generation with demand. DR represents a promising approach to mitigating the region's capacity challenges. Over the past five years, BPA has completed groundbreaking work with the Pacific Northwest Smart Grid project and managed several demand response pilots in the residential, commercial, and industrial sectors as BPA explores viable solutions for addressing both energy capacity constraints and transmission congestion.

Low Income Conservation State and Tribal Grants

BPA administers a grant program to the four Northwest states and recognized tribes within the region for the purpose of improving efficiency levels in qualified low-income residences. Grants to states are allocated on a proportional basis using the most current census data of households with incomes below federal poverty guidelines. Grants to tribes for low income services are made on an application basis and take a variety of factors into consideration including geographic dispersion, prior participation and local needs.

Market Transformation

Market transformation leverages the regional market's power to accelerate innovation and adoption of energy-efficient products, services and practices. Examples include collaborating with manufacturers to integrate conservation into their product designs and with architects and builders to promote early adoption of energy efficient designs and practices. BPA partners with and is the largest funder of the Northwest Energy Efficiency Alliance, which promotes market transformation in the Northwest.

Changes from the 2014 IPR

In 2012, BPA began operating under the framework designed in the Post-2011 process that focuses on utility equity. As of FY 2016, Energy Efficiency has also transitioned its Conservation Purchases from capital to expense spending.

New Programs/Projects

Changing customer and market needs drives BPA to develop new programs and evaluate and update the size and scale of existing programs. Energy efficiency staff designs new measures that leverage new technologies to obtain savings. Examples include ductless heat pumps, heat pump water heaters and variable speed drives for HVAC systems. Energy Efficiency also builds programs to serve evolving market opportunities. For example, BPA has launched Air Northwest HVAC Trade Ally Network to provide resources and training to improve the delivery of efficiency improvements in heating, ventilation, and air conditioning systems.

To keep a consistent savings pipeline, BPA plans to maintain investments in new measures and programs as well as evaluating its existing portfolio. This includes the development of a new Commercial Program to replace the Energy Smart Grocer Program which ended in March 2016. In addition to large-scale programs, there continues to be a need for new measure research to keep the savings pipeline full as previous measures mature and saturate the region. Once measures are implemented, quality assurance is essential to prove their reliability and persistence. BPA will continue its project and program evaluation efforts to ensure acquisition of reliable resources.

Risks of Operating at Proposed Spending Levels

BPA is holding its overall conservation infrastructure costs and major program costs flat relative to BP-16 spending levels, while reducing some areas. Areas of expansion include the development of a new Commercial Program, to replace the Energy Smart Grocer Program and the quantification of Momentum Savings.

As markets are transformed, conservation can become more difficult and more expensive to achieve. Reducing program development and associated research could put pressure on meeting targets in out years of the Council's Seventh Power Plan. Further reductions to program development resources increase the risk of BPA's ability to continue to fill the pipeline for energy efficiency in the future and to provide adequate quality assurance/quality control of delivered savings, or the piloting and scale-up of agency-prioritized demand response activities.

Challenges/Constraints

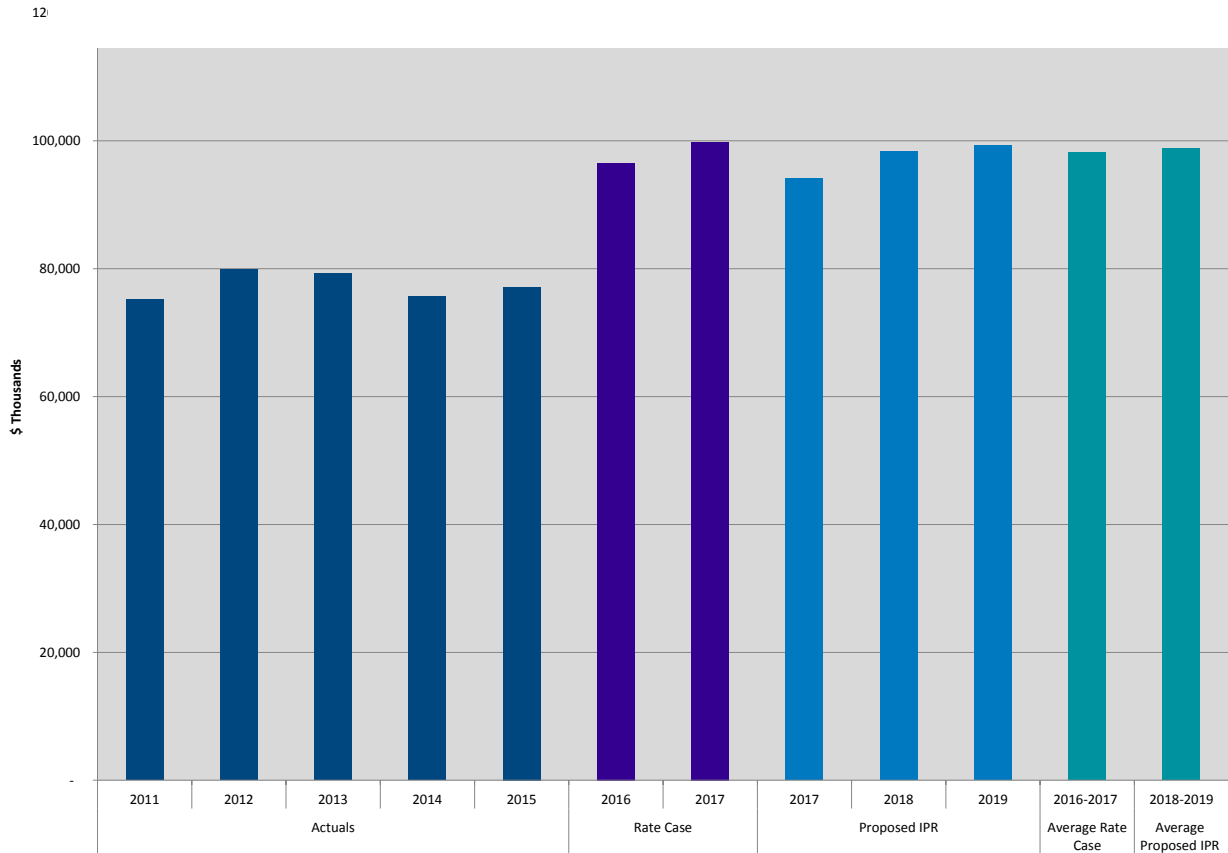
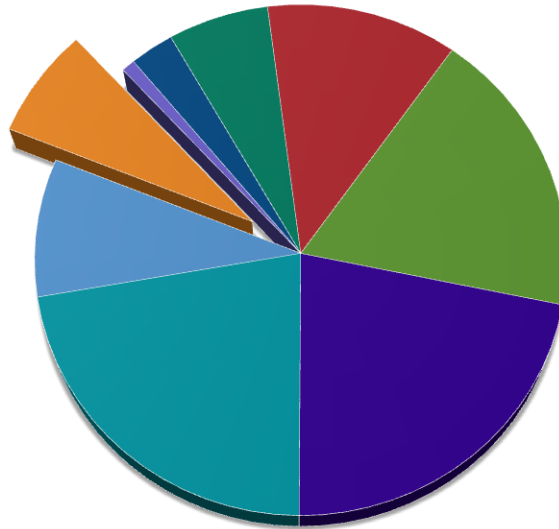
- Energy Efficiency has absorbed costs for all Emerging Technology work, formerly held in the BPA Technology Innovation organization within Corporate Strategy, to maintain investments to support new efficient technologies for the Northwest and to continue to fill the pipeline for future energy efficiency efforts.
- Travel and training funding has been reduced, which could affect Energy Efficiency's ability to provide engineering support to customers and affect savings achievement.
- Momentum Savings funding was scaled back which could present a moderate risk to developing robust analysis and some large sources may not have research completed to quantify savings. This could jeopardize target achievement.
- Evaluation funding was reduced. This could present some risk around the rigor of BPA's evaluation methods and Washington state utility compliance with Washington's Energy Independence Act (I-937) and use of BPA evaluation processes. It could also reduce EE's ability to provide feedback on program development.
- BPA is committed to continue its low-income grants to fund tribal low-income residential energy efficiency measures in Oregon, Washington, Idaho and Montana.
- BPA has a five-year grant to the Northwest Energy Efficiency Alliance through 2019 to support regional market transformation efforts.

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3.7 Non-Generation Operations

FY 2018-19 Average: Proposed IPR Costs

Non-Generation
Operations
\$98,774
7%



Program Details

(\$Thousands)	Actuals	Rate Case		Proposed IPR		
	2015	2016	2017	2017	2018	2019
Conservation Support	8,132	9,456	9,731	9,402	9,094	9,409
Executive & Administrative Services	4,783	4,326	4,402	4,309	4,070	4,155
Generation Project Coordination	5,008	7,735	7,845	6,380	6,174	6,409
Information Technology	6,190	5,805	5,910	7,241	6,976	7,294
Operations Planning	6,787	7,100	7,255	8,551	8,528	8,416
Operations Scheduling	8,358	10,307	10,496	9,878	10,054	10,404
Power R&D	6,772	6,033	6,046	5,816	5,705	5,600
Sales and Support	18,293	22,049	24,765	22,434	22,885	23,485
Slice Implementation	846	1,101	1,131	980	1,024	1,061
Strategy, Finance and Risk Management	11,986	22,628	22,256	19,168	23,787	23,017
Grand Total	77,154	96,542	99,836	94,158	98,298	99,249

Description, Purpose and Responsibilities

This section covers Power Services internal operating costs as well as the costs that are directly charged to Power for agency services support. Additional costs from agency services are also charged to Power through an allocation methodology. Power Services' internal operating costs include the salaries and benefits for approximately 348 employees (full time equivalent), plus supplemental labor, awards, and some contract costs.

These costs fall into the three main spending categories described below.

Power Services Systems Operations: Includes IT, Generation Project Coordination, & Slice Implementation

Proposed funding for Power Services Systems Operations includes funding for the Power Services' staff and contractors that oversee federal hydropower projects, contracted generating resources, slice operations, and fish operations. It also includes funding for the IT hardware, software, and systems that support Power Services. Drivers for increased IT costs include: IT costs for compliance with North American Electric Reliability Corporation Critical Infrastructure Protection regulations and implementing a Security Operations Center. Other corporate costs for environmental compliance and legal support are also included.

Power Services Scheduling: Operations Scheduling and Operations Planning

Proposed funding for Power Services Scheduling covers the staffing costs associated with power operations planning, generation scheduling, and scheduling coordination.

Power Services Marketing and Business Support: Includes Power R&D, Sales & Support, Strategy, Finance & Risk Management, Executive & Administrative Services, and Conservation Support

Proposed funding for Power Services Marketing and Business Support includes funds for staffing costs associated with requirements marketing, bulk marketing, and energy efficiency along with Power Services' awards and benefits for all Power employees.

- Northwest requirements marketing functions include customer service, power account services, power transfer services, and residential exchange.
- Bulk marketing functions include market analysis and pricing, long-term sales and purchases, bulk marketing contract support, and trading floor activities.
- Energy efficiency functions include planning and evaluation, program implementation, contract administration, distributed energy resources, and engineering.

Goals

Power's goal for this spending category is to hold spending levels equal to BP-16 levels while continuing to retain and hire staff with the skills necessary to deliver reliable, low-cost power to the Pacific Northwest. See individual Power program executive summaries for more details.

Changes from the 2014 IPR

FY 2018-19 spending generally reflects maintaining overall staffing levels, with minor exceptions. In many cases, service contracts, supplemental labor, travel and training were reduced in order to accommodate the higher staffing costs.

Risks of Operating at Proposed Spending Levels

Power Services expects proposed funding to be adequate, but there is more risk involved. If additional unforeseen external requirements or regulations are placed on Power Services or workload for ongoing activities increases beyond expectations there would be additional upward cost pressure on this program. In addition, while Power Services expects it will be able to achieve objectives at these levels, functional elements are in the process of redesigning work plans to achieve these targets. While increasing efficiency is always the objective scope, quality and cost trade-offs may emerge. In those cases, either additional workload prioritization would be required to keep spending at the proposed level, which would result in some work being delayed or not completed, or additional funds from reserves would be needed for Power Services to continue to meet its statutory obligations and customer service priorities.

For more information on the risks and impacts of the Agency Services organizations operating at proposed levels, see the Agency Services sections.

Challenges/Constraints

As with much of BPA, Power Services is faced with the potential for a large number of staff retiring from key positions in the next three to five years. The challenge is to develop current staff, hire additional staff and complete sufficient succession planning and knowledge transfer to allow Power's business to continue with minimal disruption. To aid in succession planning, Power Services plans to continue its student program as well as to allow for employees to cross train.

Trade-offs

In building its funding proposal for Non-generation Operations in FY 2018-19, Power Services held non-gen operations costs equal to those in BP-16 rate case. In order to accomplish this, Power Services organizations collectively reduced initial spending proposals by just over \$10 million by holding staffing levels close to those in FY 2016, and reducing service contracts, travel and training, and supplemental labor.

In general, the lower funding proposal limits Power Services' ability to respond to changes or additions to workload. More specifically, the risks associated with its funding proposal are:

- Reduced ability to optimize marketing short-term surplus energy to regional and extra regional entities; support ramped up program goals to address South of Allston peak loads; sustain the generation inputs program; or undertake additional procurement activities needed to support expansion of products into emerging markets.
- Reduction in contract support for the Asset Investment Excellence Initiative which presents risk to timely achievement of initiative goals. Reductions in NEPA contracts, which impact the quality of the Federal Action Agency NEPA/ESA defense²; and lost opportunity to gain efficiency to and precision of the BPA internal weather forecasts for basins and sub-basins.
- Reduced ability to provide engineering support to energy efficiency customers and amount of quality assurance/quality control; meeting Council targets in the out years of the Seventh Plan; and development of future energy efficiency measures.
- With new markets changing how the FCRPS is planned and operated, Power Services elected to reduce training to provide staff tools and skill development.
- Some of BPA's most valuable generating assets are undergoing major overhauls and maintenance work. Reducing/terminating funding for service contracts jeopardizes support overseeing O&M and capital programs with our partners through specialized expertise.

² In May 2016, the U.S. District Court for the District of Oregon issued a decision invalidating the FCRPS BiOp by NOAA's National Marine Fisheries Service and ruling that the Corps and Reclamation failed to comply with the National Environmental Policy Act when they issued decision documents to adopt and implement the BiOp. The Court has ordered NMFS to prepare a new biological opinion by March 2018. The Court also ordered the Corps and Reclamation to continue to implement and fund the 2008 BiOp through 2018 and to prepare a new EIS on FCRPS operations, including consideration of Snake River dam breaching alternative. The budget proposals in this document reflect BPA's continued funding commitments for implementation of the 2008 BiOp, consistent with the Court's direction. BPA is working with the Corps and Reclamation to identify resource needs associated with completing a new EIS as directed by the Court. As the schedule for that new EIS is subject to further Court proceedings, BPA will update its budget proposals if needed when the information is available. BPA recognizes the region's unprecedented collaboration and commitment on behalf of salmon, and the important progress these efforts have produced. We will continue our efforts with our partners to protect salmon and steelhead in the Basin.

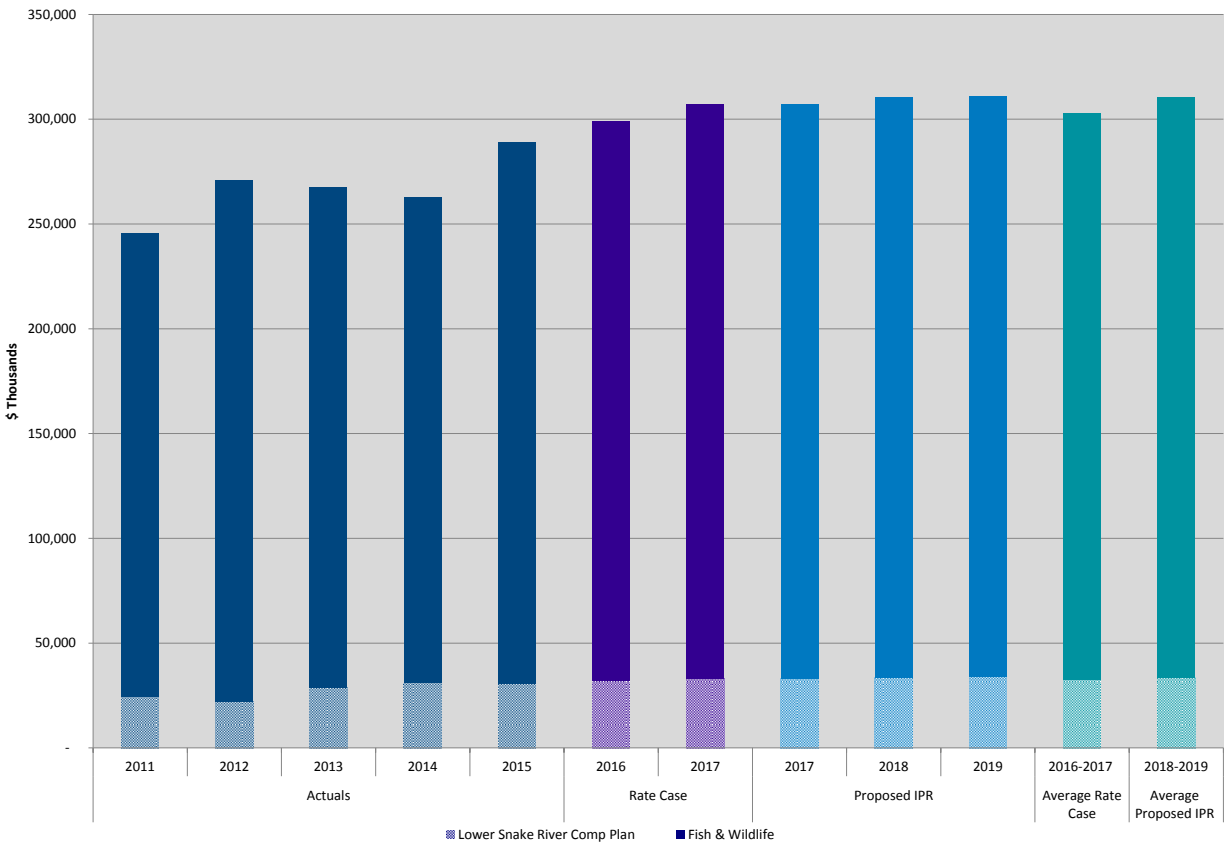
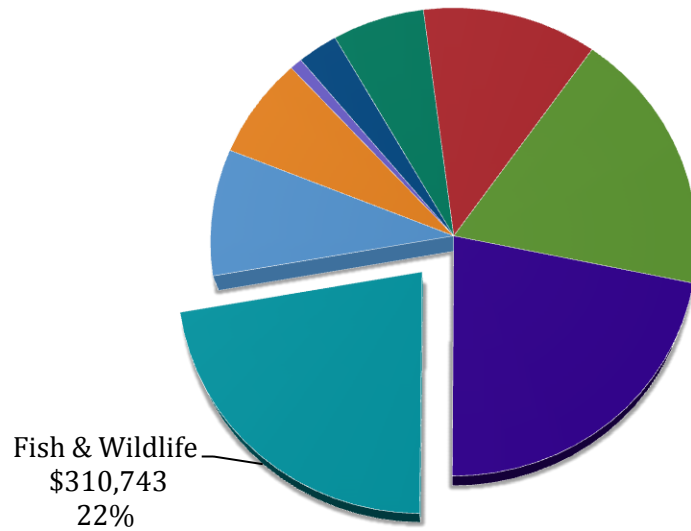
Firm vs Flexible

Nearly all of the costs in this program are fixed in that they support the staff currently working in Power Services. The flexible costs are those that were reduced, and they include service contracts and supplemental labor.

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3.8 Fish and Wildlife, Lower Snake River Comp Plan (LSRCP)

FY 2018-19 Average: Proposed IPR Costs



Program Details

(\$Thousands)	Actuals	Rate Case		Proposed IPR		
	2015	2016	2017	2017	2018	2019
Fish & Wildlife	258,177	267,000	274,000	274,000	277,000	277,000
Lower Snake River Comp Plan	30,930	32,303	32,949	32,949	33,483	34,002
Grand Total	289,108	299,303	306,949	306,949	310,483	311,002

Description, Purpose and Responsibilities

BPA’s Fish and Wildlife Program implements hundreds of projects across the Columbia River Basin each year to mitigate for the impacts of the FCRPS dams and to honor BPA’s commitments to environmental stewardship. The F&W Program includes hydro operations to improve fish passage and survival at the FCRPS dams. Tributary and estuary habitat protection and restoration actions are a major program cost area that enhances or opens blocked habitat by, for example, eliminating fish passage barriers, protecting



fish and wildlife habitat by collaborating with states, tribes and other partners, or by constructing fish screens to provide safe passage. BPA monitors the effectiveness of these actions by various means, including with the use of PIT tagging for fish tracking. Hatchery production of both anadromous and resident fish species is necessary to aid conservation efforts as well as federal harvest management objectives. These actions reflect obligations under the Northwest Power Act, the Endangered Species Act and trust and treaty responsibilities to affected Indian Tribes. BPA fulfills these obligations partly through its commitments in the Columbia Basin Fish Accords, wildlife settlements and other contracts and settlements. BPA implements these mitigation actions through annual contracts with federal, state, tribal, and local partners, in coordination with the Northwest Power and Conservation Council and independent science review.

Since the passage of the Northwest Power Act in 1980 and the first ESA listings in 1991, BPA ratepayers have provided several billion dollars of funding for major improvements and accomplishments in hydro survival, habitat protection and enhancement, and hatchery programs — with substantial benefits to the abundance and resilience of Columbia Basin fish and wildlife. Fish survival and travel times through the FCRPS dams have significantly improved. Fish that were once extirpated or near-extirpated have been brought back through innovative hatchery efforts. Over 700,000 acres of fish and wildlife lands have been protected, tributary stream flows equal to approximately 1.29 acre-feet (about 420 billion gallons instream from 2003-2015) — about ten times the amount of water used by the city of Seattle in a year – have been placed instream, and over 3,000 miles of streams have been opened up to fish access through barrier and small dam removals.

The Lower Snake River Compensation Plan (LSRCP) operates and maintains a network of eleven hatcheries and eighteen satellite facilities to mitigate for the losses of salmon and steelhead from the construction and operation of the four lower Snake River dams: Ice Harbor, Lower Monumental, Little Goose and Lower Granite. The F&W Program includes expenses for operations, evaluations and nonrecurring maintenance. Over 65 percent of the hatchery facilities constructed under this program are over 25 years old. BPA funds the LSRCP through a direct funding agreement with the U.S. Fish and Wildlife Service (a separate line item cost distinct from the Fish and Wildlife Program).

Goals

BPA is committed to fulfilling its FCRPS mitigation responsibilities and commitments using a performance-based approach, while also assuring an economical and reliable power supply. BPA takes an “All H” or lifecycle approach: first, hydro actions to improve fish survival, and then habitat protection and restoration actions and hatchery production to address remaining fish and wildlife impacts of federally owned hydroelectric dams. A primary goal is increased or maintained abundance and survival of ESA listed species and other species of concern, including salmon, steelhead, bull trout, Kootenai white sturgeon, and lamprey. BPA spending generally follows the Northwest Power and Conservation Council guideline of 70 percent for anadromous fish, 15 percent for resident fish, and 15 percent for wildlife. However, BPA actions for one species also often provide continuing ecosystem benefits, i.e., for other fish, for aquatic and terrestrial habitat generally, and for a diversity of wildlife.

Short-term goals for the LSRCP are primarily focused on maintaining fish production at current levels, planning for future reforms to achieve best management practice, and addressing high priority deferred maintenance actions.

BPA has retained F&W Program and LSRCP spending levels from previous years, so funding levels are considered stable, with adjustments only for modest inflation. BPA has put management tools in place to increase its ability to actively manage funding levels within and across fiscal years. This includes active contract management, flexibility for spending between fiscal years and between the F&W Program and LSRCP, and flexibility to exceed estimates in limited situations when necessary to meet binding commitments.

Long-Term Objective

The program’s long-term goals through FY 2019 are the same as its short-term goals. The expectation is that the program provides a strong base of biological accomplishments that should be maintained, refined, and built on, rather than re-invented.

Other than modest inflation, increases are not anticipated in the projected capital and expense spending for the F&W Program. Emerging regulatory issues, adaptive management, and new commitments will be sequenced or reprogrammed from within existing F&W Program spending to the extent possible. For example, BPA may explore additional fish or wildlife settlements with interested agencies and tribes within long-term spending constraints. Following the expiration of the Columbia Basin Fish Accords in FY 2018, there is the possibility of renewed or new Accord agreements for future priorities. Similarly, BPA, the Corps and reclamation will prepare a new

biological opinion for the operation of the FCRPS which may have new commitments for hydro operations and mitigation.

The LSRCP long-term strategy builds on its short-term goals with continuing improvements in rearing technology that allow for increased fish production using available water, expanding hatchery reforms to further advance best management practices, implementing cost-effective energy conservation initiatives for pumping and heating/cooling water and developing and implementing preventative maintenance as well as addressing deferred maintenance.

Risks of Operating at Levels below the Proposed Spending Levels

At proposed funding levels, BPA expects that it will be able to meet its commitments under the Columbia Basin Fish Accords, various BiOps, and other fish and wildlife agreements. However, there are two classes of LSRCP activities that will not be funded: deferred maintenance (including energy conservation and preventative maintenance) and activities recommended by independent scientific review to update best management practices. The consequences of reduced preventative maintenance or continued deferral of maintenance are typically higher future operating and capital costs. There is also increased risk of catastrophic failure of equipment that could result in emergency equipment replacements (typically at higher cost) or loss of hatchery fish.

The F&W Program also faces the following challenges, which would be exacerbated if funding levels were reduced from proposed levels:

- Legal challenges to the FCRPS BiOp and the ongoing litigation create uncertainty for implementation of the F&W Program, particularly for tributary and estuary habitat actions. The potential for additional requirements and ESA listings also exist³.
- Implementation of the Fish Accords; in the early years of the Accords, partners were ramping up projects at a slower rate than expected and portions of the annual funding amounts were underutilized. Accord partners have subsequently, per the flexibility in the Accords, moved unspent funding to current and future fiscal years. A significant challenge is to make these underutilized funds available while continuing to support other commitments.
- Larger land acquisitions for fish and wildlife habitat protection pose challenges to spending allocations. These large land acquisitions are difficult to plan, as numerous uncertainties surround

³ In May 2016, the U.S. District Court for the District of Oregon issued a decision invalidating the FCRPS BiOp by NOAA's National Marine Fisheries Service and ruling that the Corps and Reclamation failed to comply with the National Environmental Policy Act when they issued decision documents to adopt and implement the BiOp. The Court has ordered NMFS to prepare a new biological opinion by March 2018. The Court also ordered the Corps and Reclamation to continue to implement and fund the 2008 BiOp through 2018 and to prepare a new EIS on FCRPS operations, including consideration of Snake River dam breaching alternative. The budget proposals in this document reflect BPA's continued funding commitments for implementation of the 2008 BiOp, consistent with the Court's direction. BPA is working with the Corps and Reclamation to identify resource needs associated with completing a new EIS as directed by the Court. As the schedule for that new EIS is subject to further Court proceedings, BPA will update its budget proposals if needed when the information is available. BPA recognizes the region's unprecedented collaboration and commitment on behalf of salmon, and the important progress these efforts have produced. We will continue our efforts with our partners to protect salmon and steelhead in the Basin.

them (availability, for example); nevertheless, BPA must absorb these opportunities into available spending levels.

- The costs associated with implementing the FCRPS BiOp have risen (for example, habitat restoration in the estuary). The program has absorbed these increasing costs into existing funding amounts through aggressive project management and spending efficiencies; but this approach is unsustainable in terms of meeting continually increasing cost pressures.
- Congressional appropriations may be limited for hatchery improvements/reforms at LSRCF facilities.

Firm vs Flexible

The proposed funding reflects environmental compliance commitments under various laws and formal agreements. Consequently, these are considered firm rather than flexible elements of BPA's cost structure. The proposed funding also reflects a balance between listed species under the ESA and species that are not listed, between anadromous fish and resident fish and wildlife, and between wild and hatchery fish. With the exception of capital funding for hatchery construction and certain land acquisitions, the BPA Fish and Wildlife Program spending level is expense funded.

Trade-offs

Trade-offs are a reality in a program with fixed spending levels and the active cost management that characterize the F&W Program. Spending level and contracting decisions are based on the relative biological priority of a project in regards to the ESA, Northwest Power Act and other binding obligations. Requests for funding are cross referenced to BPA's obligations and known performance metrics of the specific action. These trade-offs and drive for efficiency are a continual aspect of managing the F&W Program.

Integration of Capital and Expense

The F&W Program consists of both capital and expense funding. Expense funding for ongoing operation and maintenance costs at hatcheries, which may include lands and fish screens, is required in order to keep those capitalized assets functioning into the future. The F&W Program is continuing to integrate these costs by establishing, through an agencywide key strategic initiative, a systematic Asset Management Program to optimize non-recurring investments to align within current operations and maintenance expenditures. Asset investments will be improved through assessments of biological priority, asset condition and useful life, costs, work clustering and other operational considerations to deliver project benefits at lowest cost to BPA. Via permanent agreements for stewardship of existing and future land acquisitions for fish and wildlife habitat, the F&W Program has optimized the use of capital dollars.

3.9 Fish and Wildlife — Capital

Program Details

(\$Thousands)	Actuals	Rate Case		Proposed CIR			FY 17- 19 Total
	2015	2016	2017	2017	2018	2019	
Asset Category Direct Spending							
Fish & Wildlife	21,373	54,800	30,800	44,602	50,533	44,000	139,134
Grand Total	21,373	54,800	30,800	44,602	50,533	44,000	139,134

(\$Thousands)	Remaining CIR						
	2020	2021	2022	2023	2024	2025	2026
Asset Category Direct Spending							
Fish & Wildlife	38,033	33,599	29,047	29,291	36,014	36,738	37,454
Grand Total	38,033	33,599	29,047	29,291	36,014	36,738	37,454

Description, Purpose, and Responsibilities

The Fish and Wildlife Program has three major asset categories. The three categories are (1) land acquisitions for wildlife credit, (2) hatchery construction and (3) fish passage structures. Land acquisitions have been a primary tool for addressing wildlife obligations under the F&W Program, with associated credit for the construction and inundation of the dams. Each hydro project has had a wildlife loss assessment that guides BPA’s mitigation responsibility. Hatchery construction projects support requirements under the ESA and the Northwest Power Act and are primarily associated with funding commitments in the Columbia Basin Fish Accords. BPA is partnering to build hatcheries across the region to supplement salmon and steelhead, and in some cases, reintroduce extirpated populations back into the Columbia River Basin. Hatcheries range in production from a few hundred thousand to several million juveniles that are released annually into rivers, streams and reservoirs. Fish Passage Structures aid in the survival by reducing the impacts of water diversions or enable access into habitat upstream of the structures for both anadromous and resident species. Improvements consist of culvert installation, replacement, modification, or removal, screening irrigation diversions, and improvements such as small dam removal that open access to additional miles of stream habitat.

Asset Management Objectives

The BPA Fish and Wildlife program objectives are informed by biological opinions, court orders, and Northwest Power and Conservation Council recommendations. BPA does not typically own or operate fish and wildlife facilities or land. BPA provides funding to deliver on objectives for hatchery and fish facility additions, upgrades and replacements and the acquisition of conservation

land parcels and easements to satisfy our Northwest Power Act, ESA, long-term agreements, and other responsibilities.

Hatchery and Fish Facility Assets: The Council provides a rigorous public process to review and prioritize facilities, including consideration of environmental compliance, biological benefit and independent scientific review, to address FCRPS fish and wildlife responsibilities. BPA considers the Council's recommendation and then makes its funding decisions based on capital availability and annual constraints to deliver on these F&W Program responsibilities. The objective behind the construction of these facilities is to protect, mitigate, and enhance fish and wildlife impacted by the FCRPS. A benefit of the successful implementation of fish and wildlife responsibilities is an increase in adult fish returns to levels that support tribal and non-tribal fisheries, continuation of conservation programs that use hatcheries to rebuild depressed or extirpated runs, and resilience in the face of climate change.

Land Assets: Various agreements have been reached with states and tribes to address fish and wildlife responsibilities from the construction and inundation of the FCRPS power system. In these agreements, BPA provides a set amount of funding for both the habitat acres and the long-term stewardship of those properties to extinguish the obligation for construction, inundation, and operation of the dams and to ensure those properties are managed in perpetuity for the benefit of wildlife species. The F&W Program is increasingly turning to settlement agreements to provide an efficient and cost-effective alternative to annual funding of O&M.

Fish Passage Assets: Program objectives surrounding passage improvements are part of the F&W Program's strategy to rebuild rivers and streams for fish survival and reproduction. The strategy for passage improvements is to locate areas that need improvement that provide the largest biological benefit. To date, the F&W Program has opened up thousands of miles of river habitat that had been blocked by primarily manmade structures, providing increased fish access to spawning grounds. Fish screens in heavily irrigated areas around the region have been a major focus of the F&W Program to provide safe passage for both anadromous and resident fish from destructive irrigation channels.

Key Drivers

The following are key drivers in determining the level of capital funding for the fish & wildlife capital projects:

- Northwest Power and Conservation Council's Fish and Wildlife Program.
- Endangered Species Act.
- Biological Opinions.

Strategic Challenges⁴

There are many uncertainties that impact the implementation of the Fish and Wildlife Program. For capital spending, annual spending level planning is based on best estimates that are subject to change given issues that are outside of BPA's control. Accordingly, the F&W Program focuses on the flexibility of multi-year planning and shaping of available spending levels on an annual basis to support work that is most likely to be ready to implement.

For resident fish and wildlife land acquisitions, there are significant uncertainties with regard to willing sellers in priority locations identified for land acquisitions. Land appraisals, permitting, terms of conservation easements, and environmental compliance are unique to each parcel and may affect the cost or timing of closing of land acquisitions. Additionally, stakeholder outreach sometimes can also influence the timing of closing as we strive for broad understanding and support for the acquisition relative to our fish and wildlife responsibilities.

Proposals for hatchery projects typically go through a comprehensive review process by the Northwest Power and Conservation Council (known as the "3 Step process") which includes development of a Master Plan, design, and environmental and science review, leading to a Council recommendation. Hatchery projects are complex and may include challenges similar to those with land acquisitions, as well as consideration of design alternatives, adequacy of available water supply, environmental permits, acclimation facilities and other hatchery-associated issues.

Uncertainties on fish passage projects include some of the same challenges described above, including local government and private landowner interests, state and federal permit requirements, in-water work windows, and risks associated with operational failures, including natural events like fire and weather that may compromise the effectiveness of the investment.

⁴ In May 2016, the U.S. District Court for the District of Oregon issued a decision invalidating the FCRPS BiOp by NOAA's National Marine Fisheries Service and ruling that the Corps and Reclamation failed to comply with the National Environmental Policy Act when they issued decision documents to adopt and implement the BiOp. The Court has ordered NMFS to prepare a new biological opinion by March 2018. The Court also ordered the Corps and Reclamation to continue to implement and fund the 2008 BiOp through 2018 and to prepare a new EIS on FCRPS operations, including consideration of Snake River dam breaching alternative. The budget proposals in this document reflect BPA's continued funding commitments for implementation of the 2008 BiOp, consistent with the Court's direction. BPA is working with the Corps and Reclamation to identify resource needs associated with completing a new EIS as directed by the Court. As the schedule for that new EIS is subject to further Court proceedings, BPA will update its budget proposals if needed when the information is available. BPA recognizes the region's unprecedented collaboration and commitment on behalf of salmon, and the important progress these efforts have produced. We will continue our efforts with our partners to protect salmon and steelhead in the Basin.

Strategy Direction

The Fish and Wildlife asset strategy conforms as closely as possible to the agency's policy on developing asset management strategies (BPAM 661). This strategy focuses on investments for which BPA retains discretion to influence the relative prioritization, selection, implementation, and on-going support of investments and land acquisitions.

Wildlife responsibilities are met with current program strategies of funding land acquisitions that permanently provide significant wildlife benefit and contribute toward achieving completion of BPA's obligations. The F&W Program is continuing to utilize settlement agreements to fully satisfy BPA's responsibilities through land acquisition and long-term payments for stewardship of the properties in perpetuity. By defining the dollars, stewardship funds and outstanding acres, the F&W Program and its sponsors have gained certainty of funding while permanently satisfying BPA obligations.

Hatchery production is used to increase the numbers of salmonid juveniles that out-migrate to the ocean and increase the number of adult returns. Additionally, for some fish populations needing additional support, hatcheries have been used as a safety net program to protect the genetics of certain stocks and species. The objective is to supplement ESA-listed fish populations as guided by various BiOps. Our strategy is to continue working with sponsors through the Council's 3-Step process to develop hatchery projects for potential funding to ensure the best available science is followed.

Results to be Achieved

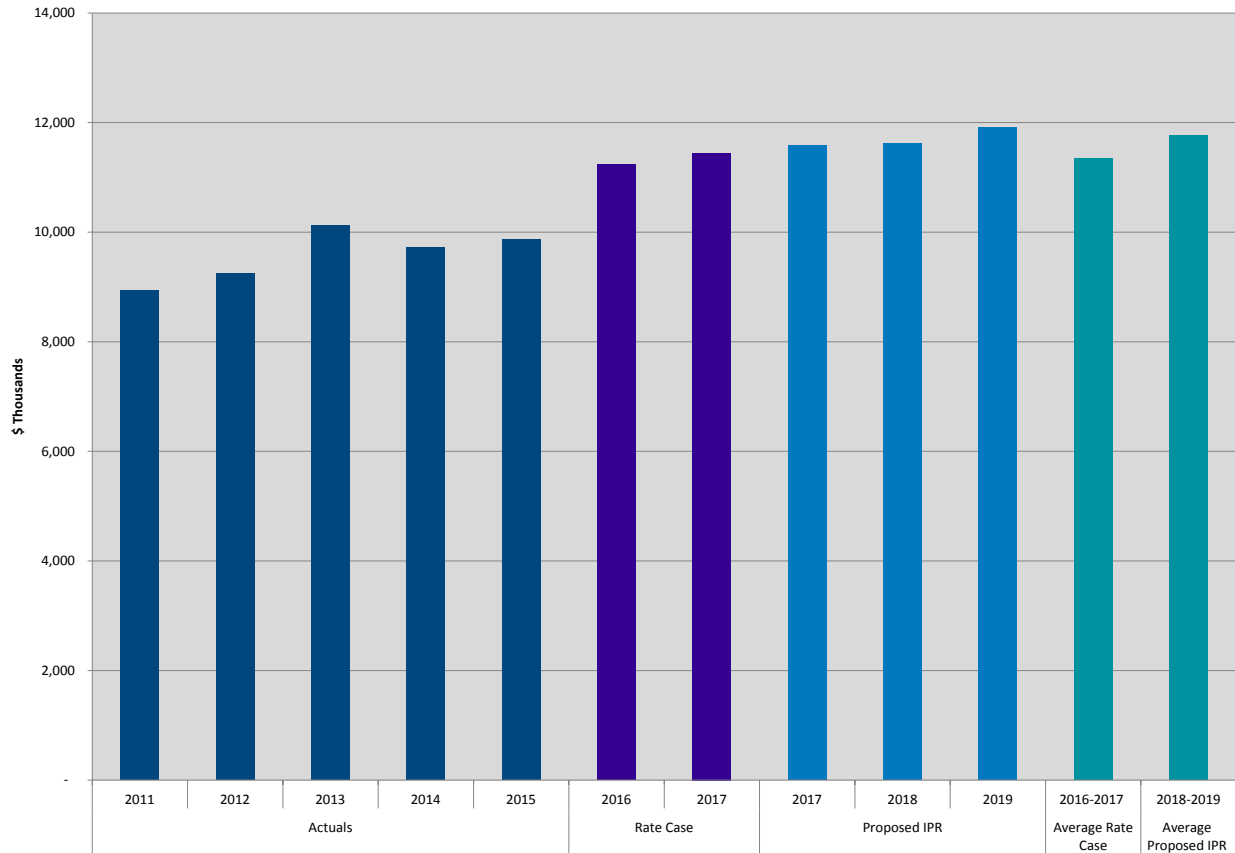
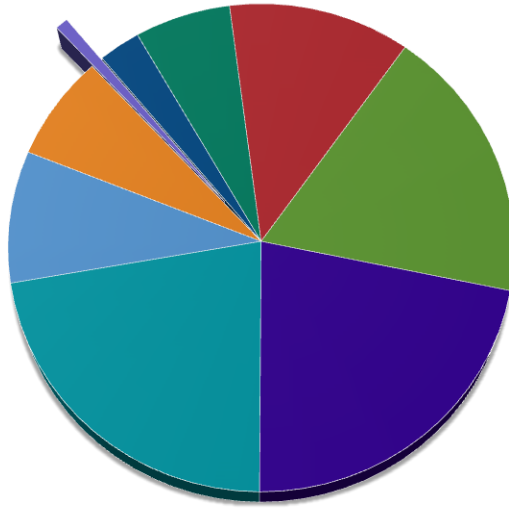
Results to be achieved for each of the asset categories are unique to that category. Hatchery success is based on protection and survival of captive brood stock for supplementation to "reseed" fish populations or to increase number of out-migrants, with subsequent returning adults to contribute to harvest, brood stock for the hatchery or spawning in the wild. Fish Passage Structures are assessed primarily by the decrease in fish entrainment in water diversions or by the miles of habitat accessible to fish populations. Land acquisitions for resident fish or wildlife credit will be measured through two objectives; first, the acquisitions agreed to are reviewed to ensure that progress is made to extinguish the obligation within the agreed timeframe. Second, lump sum stewardship funds are included to eliminate ongoing operations and maintenance costs of the acquisitions.

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3.10 Northwest Power and Conservation Council (NWPPCC)

FY 2018-19 Average: Proposed IPR Costs

NW Power &
Conservation
Council
\$11,769
1%



Program Details

(\$Thousands)	Actuals	Rate Case		Proposed IPR		
	2015	2016	2017	2017	2018	2019
NW Power & Conservation Council	9,870	11,236	11,446	11,590	11,624	11,914
Grand Total	9,870	11,236	11,446	11,590	11,624	11,914

Description, Purpose and Responsibilities

The Northwest Power and Conservation Council was authorized by Congress and established by the states of Washington, Oregon, Idaho, and Montana as part of the Northwest Power Act of 1980. The primary duties of the Council are (1) develop a regional power plan, (2) develop a fish and wildlife program as part of the power plan, and (3) provide for broad public participation in these processes. BPA provides funding for the Council under a formula specified by the Northwest Power Act.

Goals

The Act requires the Council to review its Power Plan no less than every five years, beginning with a review and updating of the Fish and Wildlife Program. The Council completed its review and revision of the Fish and Wildlife Program in October 2014. The Council adopted the Seventh Northwest Conservation and Electric Power Plan in February 2016. The plan provides guidance to BPA when it acquires resources to meet its load supply obligations. BPA anticipates that there will be a mid-point review on implementation of the Power Plan, including progress toward meeting energy efficiency goals, in the FY 2018-19 rate period.

BPA also will continue to work closely with the Council, project sponsors, and other stakeholders to ensure that implementation of mitigation projects supporting the Fish and Wildlife Program provide the best benefit to fish and wildlife at the least cost to BPA ratepayers.

Long-Term Objective

Work collaboratively with the Council and other regional interests to implement the Fish and Wildlife Program and the Seventh Power Plan, including meeting BPA's obligations under the Northwest Power Act, the Endangered Species Act, and other applicable statutes to protect, mitigate, and enhance fish and wildlife impacted by the FCRPS while providing an adequate, efficient, economical, and reliable power supply.

Changes from the 2014 IPR

The 2014 IPR anticipated the Council, BPA and other regional interests working to revise the Fish and Wildlife Program and develop the Seventh Power Plan. The 2016 IPR is targeted at the Council working with BPA and other parties to implement different elements of the revised Fish and Wildlife Program and Seventh Power Plan. From the Council's perspective, the Council anticipates a decrease in FY 2017 spending needs as compared to earlier estimates in its own budget planning process (due to the elimination of three FTE positions), followed by modest increases of 0.3 percent in FY 2018 and 2.5 percent in FY 2019. In addition, during the 2014 IPR, BPA agreed to and implemented some changes to ensure transparency and consistency around how it calculates the Council's statutory funding range. Specifically, BPA is using inputs from its most recent rate case to calculate the Council's funding range and agreed that it would provide public notice of any changes to its methodology. BPA has not made changes in its methodology since the 2014 IPR and does not anticipate making any changes in FY 2017-19.

Risks of Operating at Levels below the Proposed Spending Levels

Given the Council's status as an independent regional body with important responsibilities related to power planning and fish and wildlife, BPA does not exercise direct control over Council spending levels. Instead, as noted above, the Council goes through its own public spending level process. Funding below levels identified by the Council, especially after its goes through its public spending level process, could put various Council programs and projects at risk.

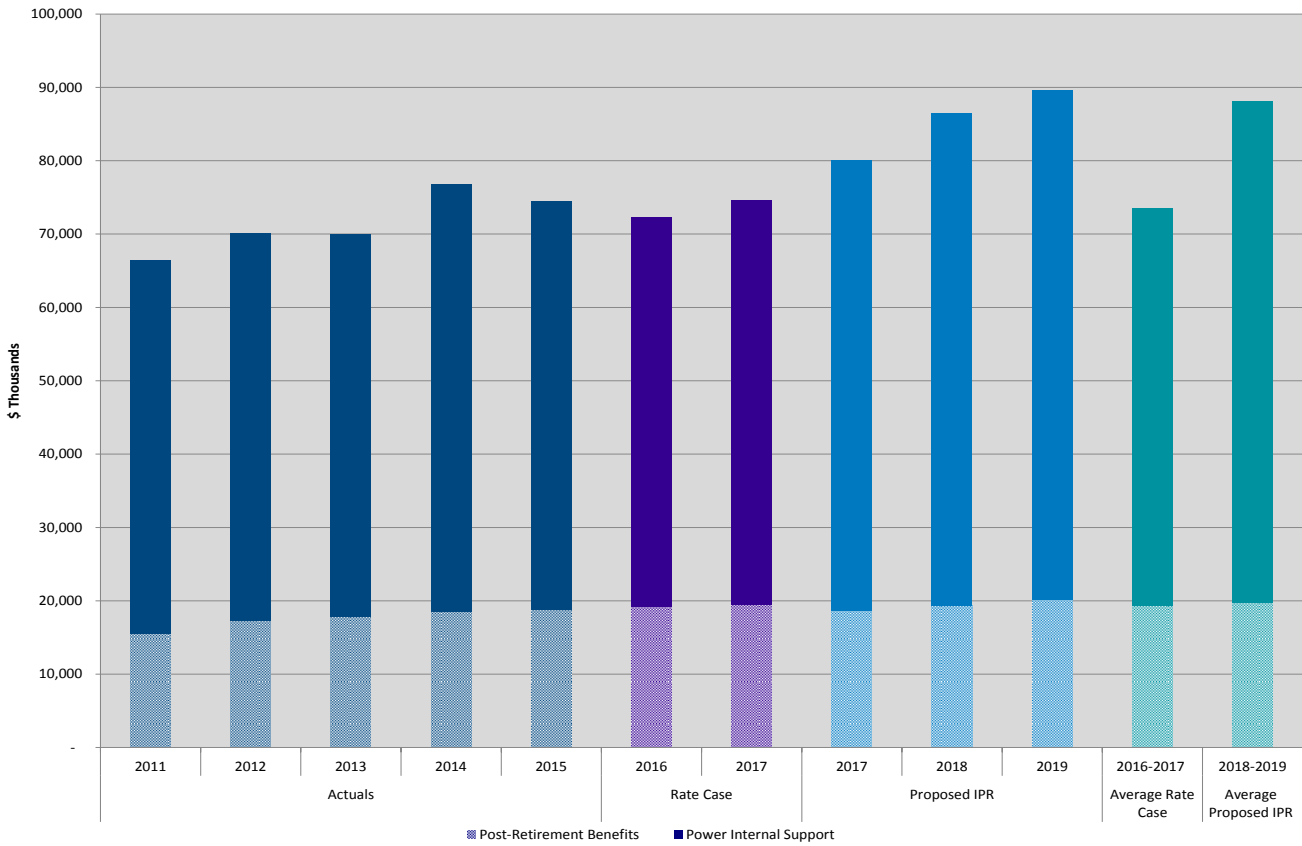
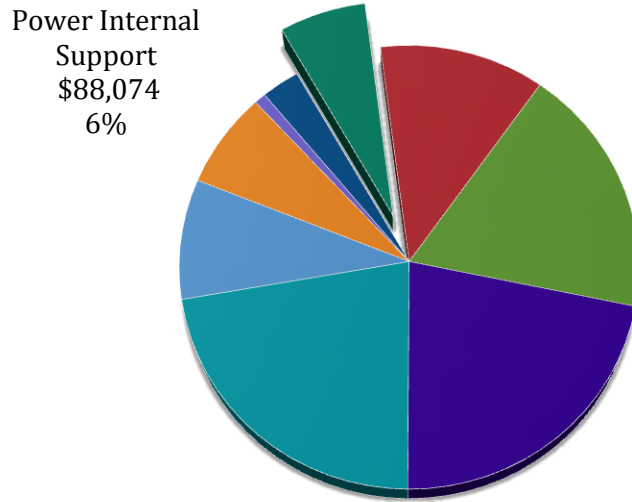
Challenges/Constraints

BPA respects the Council's annual spending level process, which is open and accessible to parties interested in the Council's funding levels and priorities. However, one challenge is that following a rate case, the Council may adopt final, adjusted annual spending levels, particularly in the out years that are different from the spending levels accounted for in rates. To help address this situation, BPA and the Council have used a series of multi-year spending level agreements to ensure spending levels remain consistent with the IPR process and final rate case. The Council and BPA are currently discussing and will likely reach an agreement during the IPR that would cover FY 2017-19.

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3.11 Power Internal Support

FY 2018-19 Average: Proposed IPR Costs



Program Details

(\$Thousands)	Actuals	Rate Case		Proposed IPR		
	2015	2016	2017	2017	2018	2019
Additional Post-Retirement Benefits	18,819	19,143	19,478	18,649	19,345	20,100
Power Internal Support	55,693	53,138	55,168	61,409	67,210	69,492
Grand Total	74,512	72,281	74,646	80,058	86,556	89,592

Description, Purpose and Responsibilities

Internal support consists of two separate programs, Additional Post Retirement Benefits Contributions and Power Agency Services General and Administrative. The internal support program is included in both the power and transmission rates. Since the program is the same for each business unit, the full narrative is captured here in the Power business unit section and only a brief summary and corresponding table are included in [section 4.10](#) for the Transmission business unit.

Additional Post-Retirement Benefits Contribution:

Both federal employers and their employees contribute a percentage of eligible employee compensation toward funding the employees' post-retirement benefits. The Agency and employee contribution rates under the Civil Service Retirement System are 7 percent each. Under the Federal Employees Retirement System, the contribution rates are 11.7 percent and 0.8 percent, respectively. The Federal Government has determined these contributions are not sufficient to fully fund the future cost of post-retirement benefits, leaving the plans underfunded. Employees also usually participate in the Federal Employees Health Benefits Program and/or the Federal Employees' Group Life Insurance Program; these plans are similarly underfunded. Beginning in 1998, the BPA Administrator elected to include an additional post-retirement contribution as an operational expense as part of power and transmission rates for the FCRPS. Therefore, BPA voluntarily remits to U.S. Treasury each year, in the year-end payment, a contribution as an effective offset to the underfunded portion. The contribution includes component amounts that represent both BPA retirees and the retirees related to the power producing operations of the Corps and Reclamation.

Agency Services General and Administrative:

BPA has fifteen General and Administrative cost pools: Executive; IT Applications System Support; Security; Legal Services; Human Resources; Finance and Accounting; Safety; IT Management and Administrative; IT Infrastructure; IT Cross Agency Projects; Workplace Services; Public Affairs; Supply Chain Purchasing; Dedicated Workplace Services for Power/ Transmission; and Agency Services Awards.

These pools are used to spread shared corporate costs to the Power and Transmission business units. The G&A allocation rates are reviewed and updated on a bi-annual basis. Each pool is examined to determine the appropriate drivers of cost. The cost drivers are used to determine the allocation rates. The costs associated with these pools are assigned to the Agency Services G&A program for each business unit.

In addition, BPA has nine business support pools. These are: Strategy Integration; Risk; IT Dedicated Projects for Power; Dedicated Projects for Transmission; Supply Chain Administration; Supply Chain Purchasing; Technology Innovation; Billing and Metering Services; and Contracting and Forecasting Services. These Business Support pools are assigned to the Power Services and Transmission Services programs that directly benefited from the services provided.

The G&A and Business Support pools are collections of costs from the centralized Agency Services organizations. The description of products and services provided by these organizations can be found in the individual organizations executive summaries.

Goals

The Agency Services organizations seek to provide governance and support to the business units at the lowest possible cost, with costs being allocated appropriately.

The near-term and long-term objectives for each of the organizations contributing to the Agency Services General and Administrative pools can be found in the individual organization's executive summaries.

Changes from the 2014 IPR

Agency Services General and Administrative:

Before each IPR process, BPA's Accounting and Reporting group conducts a review of the Agency Services cost allocations pools and the cost drivers used to assign Agency Services costs to power and transmission rates. As part of this review, they meet with key managers and their analysts to review the makeup of the cost pools, possible changes in services, and update the cost drivers. Potential changes to allocations are presented to the Accounting Officer manager for review and approval. They are then implemented in the IPR, the upcoming year's spending levels and the next year's rate percentages used to allocate actual Corporate costs. For further discussion, see section 6.1. The significant changes for each of the organizations contributing to the Agency Services General and Administrative pools can be found in the individual organizations executive summaries.

Risks of Operating at Levels below the Proposed Spending Levels

The Agency Services General and Administrative funding levels are determined by the level of service required to support the business units. If funding for Agency Services is reduced from the proposed levels, there would be some services that could no longer be provided. Those services are outlined in each of the individual organizations executive summaries.

Challenges/Constraints

Agency Services G&A:

The Agency Services organizations continue to seek efficiencies. The challenges and constraints for each of the organizations contributing to the Agency Services General and Administrative pools can be found in the individual organizations executive summaries.

Each organization has included the trade-offs made in coming to the IPR spending levels contained in this document, as well as, describing the Firm vs Flexible components of their cost structure.

3.12 Columbia River Fish Mitigation

Program Details

(\$Thousands)	Proposed Capital Spending Levels									
	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026
Columbia River Fish Mitigation	165,287	98,011	83,232	54,146	12,411	12,967	31,601	86,114	17,405	108,822
Grand Total	165,287	98,011	83,232	54,146	12,411	12,967	31,601	86,114	17,405	108,822

The Columbia River Fish Mitigation Program (CRFM) was established by Congress in the early 1990s to fund anadromous fish passage facilities at eight Corps of Engineer dams on the Columbia and Snake Rivers. The program has expanded to include work in the Columbia River estuary as well as at Corps of Engineer dams on the Willamette River. This program is funded through annual Congressional appropriations to the Corps of Engineers. BPA is responsible for the repayment of the power portion of the spending. The power share is variable between projects but averages approximately 80% of the total for the applicable Columbia and Snake River projects and approximately 50% on the Willamette Valley projects. The Corps of Engineers has indicated that the presumptive path of spending on the Columbia and Snake portions of the program will ramp down after 2018 while construction and associated RM&E actions as part of the Willamette Valley program will ramp up and continue through at least the late 2020s⁵.

⁵ In May 2016, the U.S. District Court for the District of Oregon issued a decision invalidating the FCRPS BiOp by NOAA's National Marine Fisheries Service and ruling that the Corps and Reclamation failed to comply with the National Environmental Policy Act when they issued decision documents to adopt and implement the BiOp. The Court has ordered NMFS to prepare a new biological opinion by March 2018. The Court also ordered the Corps and Reclamation to continue to implement and fund the 2008 BiOp through 2018 and to prepare a new EIS on FCRPS operations, including consideration of Snake River dam breaching alternative. The budget proposals in this document reflect BPA's continued funding commitments for implementation of the 2008 BiOp, consistent with the Court's direction. BPA is working with the Corps and Reclamation to identify resource needs associated with completing a new EIS as directed by the Court. As the schedule for that new EIS is subject to further Court proceedings, BPA will update its budget proposals if needed when the information is available. BPA recognizes the region's unprecedented collaboration and commitment on behalf of salmon, and the important progress these efforts have produced. We will continue our efforts with our partners to protect salmon and steelhead in the Basin.

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4. TRANSMISSION SERVICES

OVERVIEW

Transmission Services preliminary rate increase is 3 to 5 percent.

- Transmission Services is investing to save: Spending levels reflect investments that, if completed today, will provide greater savings to ratepayers.
- By focusing on mission critical work, our proposal holds capital to 2014 CIR levels and limits expense level increases to \$42 million.

Transmission Services' proposed spending for FY 2018-19 builds on BPA's longstanding legacy of transmission system reliability by cost-effectively managing and maintaining our assets, and developing a strategic framework, built on a foundation of safety, regulatory and statutory compliance that delivers innovative products and market-based solutions for Northwest customers. The costs follow three main principles: hold the line on spending to limit rate increases, focus on mission critical work, and make investments that will provide greater savings to ratepayers if completed today.

BPA's Transmission Services organization owns and manages approximately three-fourths of the Northwest region's high voltage transmission assets, an interconnected network of more than 15,100 circuit miles of transmission lines connecting 261 substations, 732 communication sites and 3,100 miles of fiber optic cable providing dedicated protection, monitoring and control to the power system. The system spans an area of 300,000 square miles. BPA's Transmission System includes more than a thousand individual facilities, more than 43,500 steel towers, 73,500 wood poles, and 195,600 acres of right-of-way corridors. The average age of many of these components is approaching 50 years, and many are well past the end of their economic life-cycle.

To manage these resources, Transmission Services' relies on a proactive strategic approach, including the exploration of technological innovations as well as recognizing and responding proactively to changing system conditions. BPA is also prioritizing transmission system expansion and sustain projects based on safety, reliability, regulatory and market-driven commercial criteria. Finally, BPA is responding to industry and ratepayer needs and a rapidly-shifting energy marketplace by exploring new ways to provide transmission service.

The changing landscape from market and regulatory changes, safety, and technology, for example, is exerting pressure on BPA's spending levels. Despite external pressures, BPA must maintain and improve the reliability and capacity of an aging transmission system and all of the information technology and operations technology systems that support it. In addition, there is an increased need for flexible products and services to maintain a competitive position and effectively serve the

region. BPA must position itself to adapt as forecasted demand, impacts to energy markets, generation choices, and national/regional/local policies evolve.

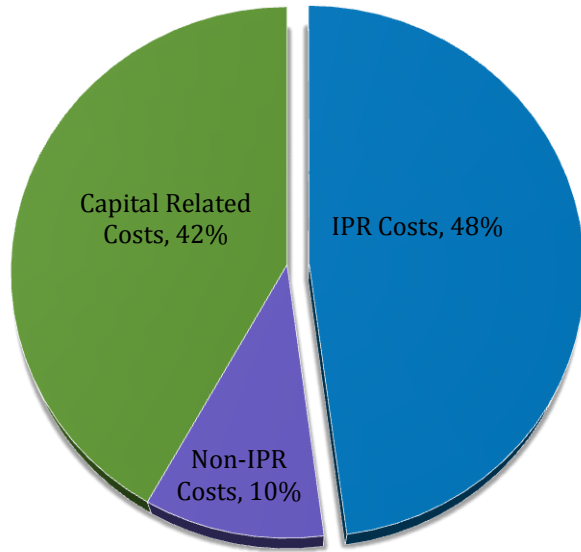
As the major provider of bulk electric transmission service in the Northwest, BPA must comply with all applicable statutory requirements, reliability standards and orders, cultural and environmental regulations, the provisions and contractual obligations of its Open Access Transmission Tariff, and with internal business practices and strategies. Transmission Services' goal is to meet the agency's compliance requirements while ensuring the continued economic viability, reliability, and safe operation of the transmission system, now and in the future, at the lowest possible cost consistent with sound business practices.

In FY 2016, the pace of change in the compliance, reliability and market transformation arenas continues to impose significant workflow and resource challenges on the Transmission Services organization. However, Transmission Services is committed to maintaining low rates consistent with sound business principles. The proposed spending levels represent trade-offs to support that commitment while continuing mission critical work and investing in opportunities that provide future savings.

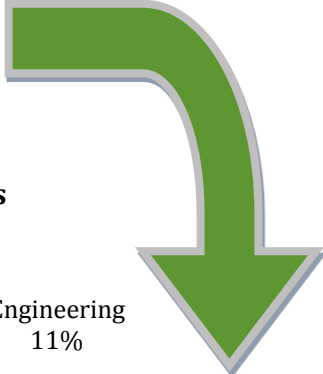
Transmission Services' actual FY 2015 IPR costs were \$461 million. During the upcoming rate case period, Transmission Services expense spending levels are expected to increase by 15 percent over FY 2015 actuals in order to accomplish required compliance, reliability and market transformation activities. These increases are being offset by annual undistributed reductions in Transmission Services.

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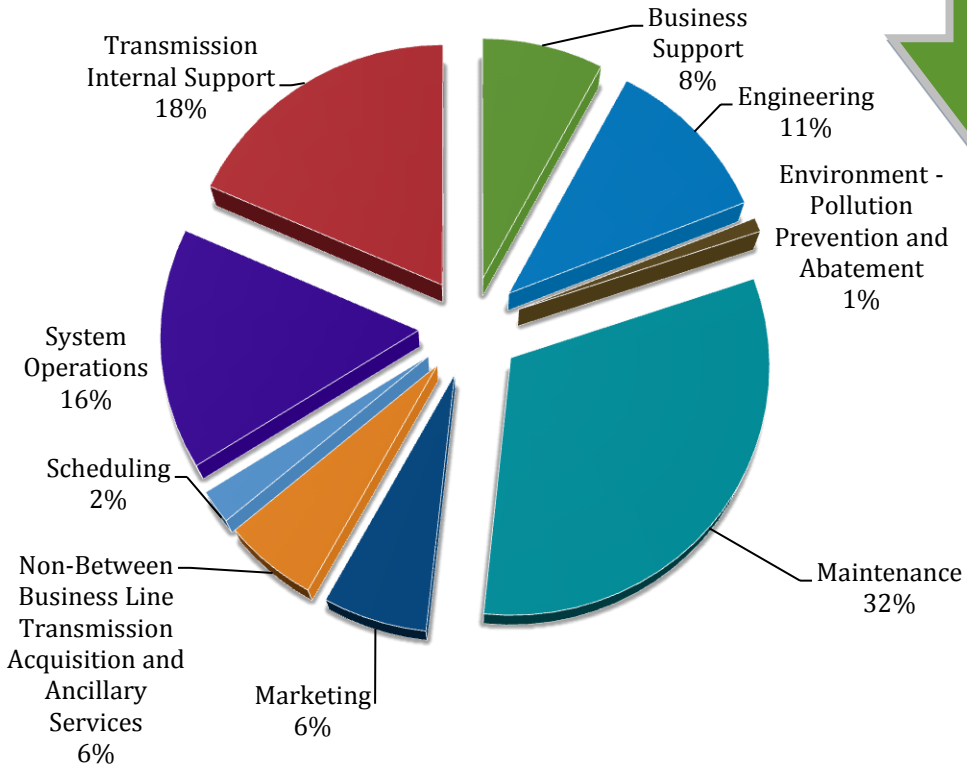
**Transmission Potential Revenue Requirement
FY 2018 - 19 Average**



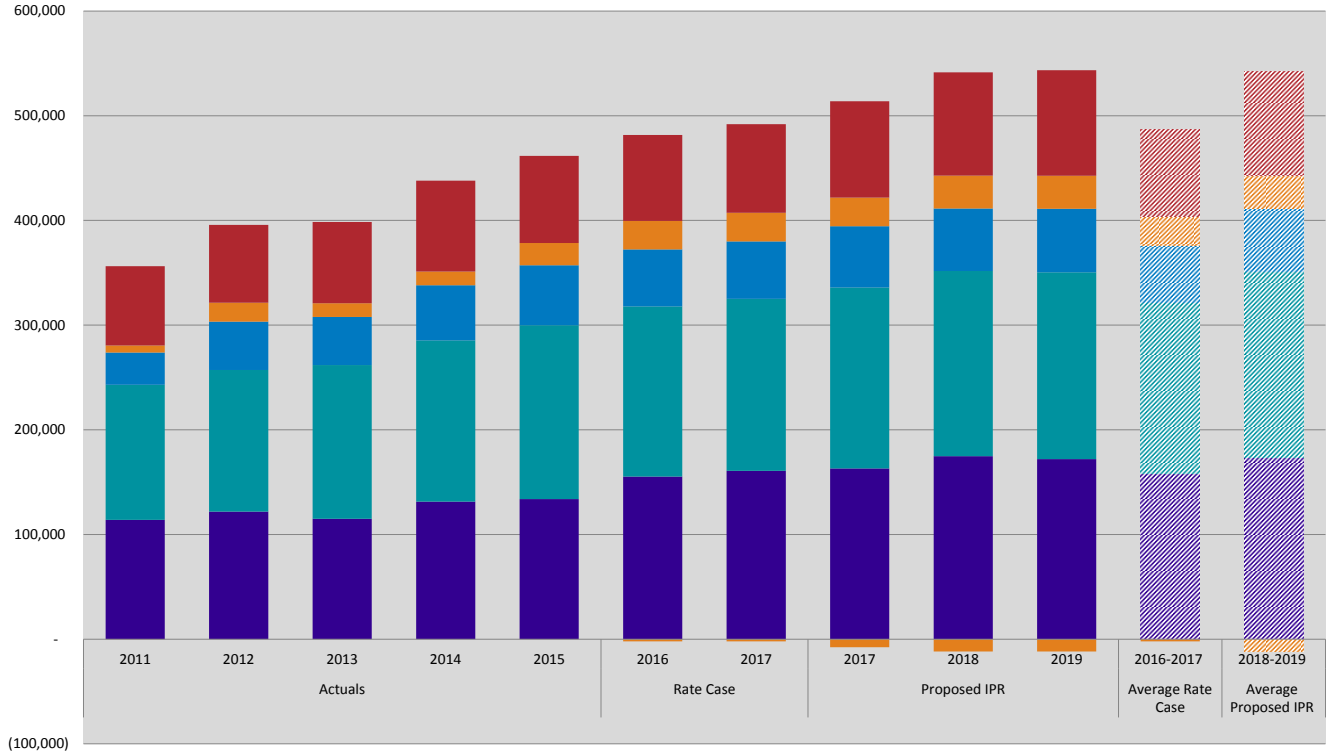
The revenue requirement includes costs outside the scope of the IPR.



FY 2018-19 Average: Proposed IPR Costs



Transmission Services Expense Summary



■ Operations ■ Maintenance ■ Engineering ■ Non-Between Business Line (Non-BBL) Transmission Acquisition and Ancillary Services ■ Transmission Internal Support ■ Undistributed Reduction

	(\$Thousands)					
	Actuals 2015	Rate Case 2016 2017		Proposed IPR 2017 2018 2019		
Costs Described in IPR						
Operations	133,793	155,274	160,800	163,034	174,772	171,983
Maintenance	166,157	162,552	164,272	172,828	176,893	178,365
Engineering	57,251	54,421	54,915	58,602	59,688	60,765
Non-Between Business Line Acquisitions and Ancillary Services	21,253	27,338	27,353	27,331	31,500	31,500
Transmission Internal Support	83,190	82,038	84,523	92,053	98,602	100,786
Undistributed Reduction/Other Income (Loss)	-161	-2,100	-2,100	-7,668	-11,831	-11,825
Costs Described in IPR Total	461,483	479,523	489,763	506,180	529,624	531,573
Other Costs						
Between Business Line Acquisitions and Ancillary Services	121,261	113,429	113,429	115,750	113,559	113,774
Reimbursables	10,641	9,641	9,735	9,922	9,929	9,936
Other Costs Total	131,902	123,070	123,164	125,672	123,488	123,710
Grand Total	593,385	602,592	612,926	631,851	653,112	655,284

4.1 Transmission - Capital

Program Details

(\$Thousands)	Actuals	Rate Case		Proposed CIR			FY 17- 19 Total
	2015	2016	2017	2017	2018	2019	
Asset Category Direct Spending							
Transmission	559,053	422,242	372,444	372,444	317,044	310,544	1,000,033
Other Costs							
PFIA	964	15,000	15,000	15,000	15,000	15,000	45,000
Transmission Indirects	53,690	57,561	48,694	48,694	42,733	41,914	133,341
Corporate Indirects	50,340	57,561	48,694	48,694	42,733	41,914	133,341
AFUDC	42,603	44,448	26,242	24,099	22,854	22,892	111,300
Other Costs Total	147,596	174,569	138,630	136,488	123,321	121,720	422,983
Grand Total	706,649	596,811	511,074	508,932	440,365	432,264	1,423,015

(\$Thousands)	Remaining CIR						
	2020	2021	2022	2023	2024	2025	2026
Asset Category Direct Spending							
Transmission	455,500	472,900	482,400	440,900	420,900	416,600	431,900
Other Costs							
PFIA	15,000	15,000	15,000	15,000	15,000	15,000	15,000
Transmission Indirects	40,329	31,119	31,439	31,850	32,480	33,133	33,779
Corporate Indirects	40,329	31,119	31,439	31,850	32,480	33,133	33,779
AFUDC	22,892	23,488	23,238	22,289	21,874	22,181	22,521
Other Costs Total	118,550	100,726	101,116	100,988	101,835	103,448	105,079
Grand Total	574,050	573,626	583,516	541,888	522,735	520,048	536,979

Description, Purpose, and Responsibilities

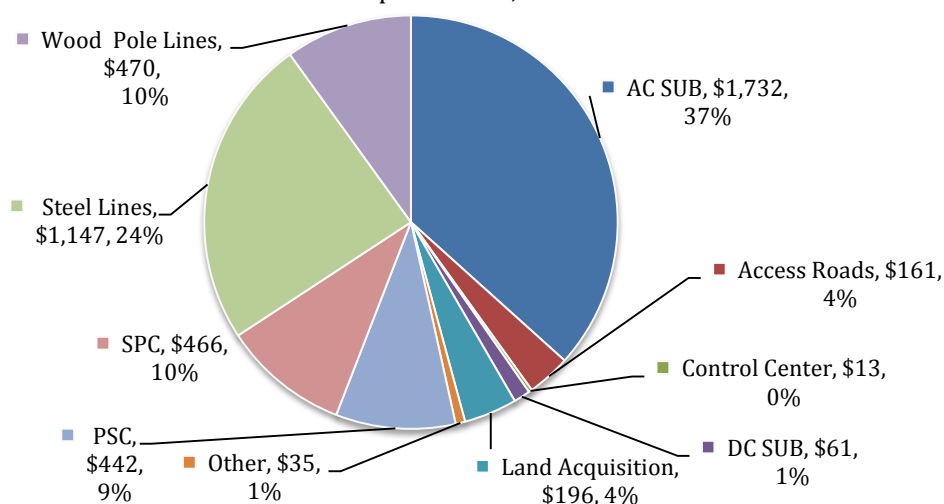
With BPA's responsibility to serve the majority of the Northwest region's high-voltage needs, a robust asset management strategy and plan for deployment of capital is essential. BPA's strategy covers nine primary asset programs including alternating current substations, direct current substations, control centers, power system control, system telecommunications, system protection control, rights-of-way, wood pole lines and steel lines. The assets within these programs deliver electric power to more than 12 million people through:

- Transmission service to regional utilities.
- Generation and line and load interconnections.
- Interregional transfers of capacity and energy.
- Ancillary services, such as regulation and load following services.

Transmission Net Value

Total: \$4.72B

As of September 30, 2015



Vision & Long-Term Goals

BPA's vision for managing transmission states that "Transmission Services will manage its assets to achieve safety, high reliability, availability and adequacy standards and maximize economic value for the region. It will use efficient practices that are effective in managing risks and delivering results." With this vision, long-term transmission asset management goals have been developed that focus on:

- Integrating system expansion, replacements and maintenance to optimize the asset lifecycle.
- Prioritizing investments in terms of asset criticality and risk to meet reliability and other standards at lowest total economic cost.
- Delivering on the asset management strategy through a balanced funding and resourcing plan.
- High data quality for asset attributes, e.g. condition and performance to support decision-making.

Aligning to BPA's Priorities, Key Strategic Initiatives and Focus 2028

The transmission asset management strategy aligns with BPA's priorities for Physical Assets, Sustainable Finances & Rates, and Reliable, Efficient and Flexible Operations. Action plans for Focus 2028 are taking shape as a result of the efficiency improvements currently underway from Transmission Services' strategic priorities. These action plans will support the implementation of BPA's KSI's for Asset Management, Long-Term Financial & Rates and the Business Information Systems.

The utility industry is in the midst of great change, resulting in an increased need for flexible products and services to maintain a competitive position and effectively serve the Northwest. BPA must position itself to adapt as forecasted demand, impacts to energy markets, generation choices, and national, regional and local policies evolve. In November 2015, BPA launched Focus 2028 with

customers and regional constituents to begin a dialogue about the changing environment and challenges to think about the future and opportunities to enhance the value provided to the region. The focus has been on the effects of industry changes, such as the California Independent System Operator's Energy Imbalance Market, which could result in dispatch changes; increasing renewable portfolio standards adding pressure for more wind investments with 9,000 megawatts of transmission service requests in the queue already; and evolving energy storage technology. As a result, Transmission Services is developing action plans for managing the transmission system today through well-planned, cost effective asset plans, while also positioning Transmission to meet the regional needs of tomorrow.

Challenges

Today's utility environment has exerted additional demands on how BPA's transmission assets are managed. The transmission asset management strategy must manage the following challenges:

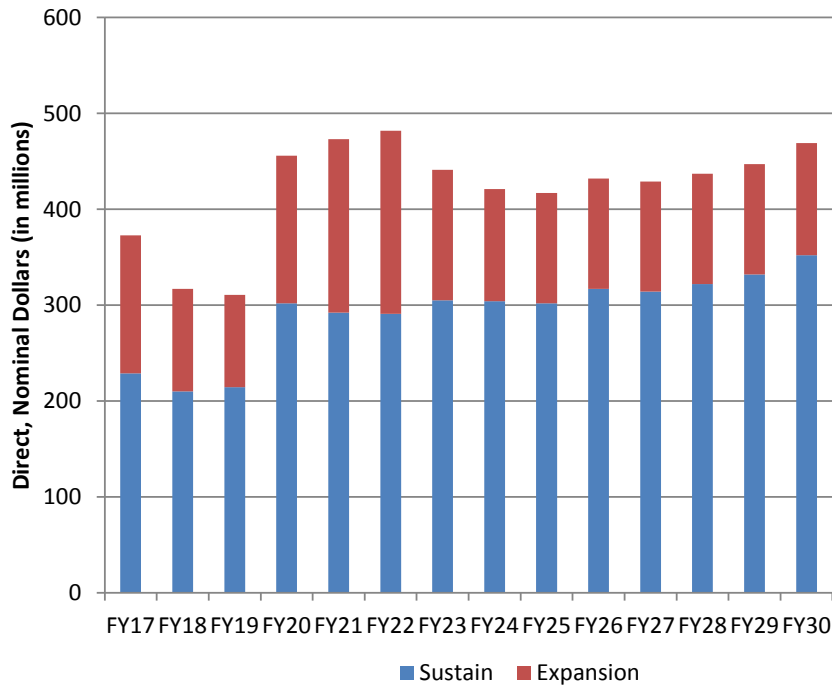
- Gaining valuable efficiencies through new technology.
- Ensuring reliability and interoperability of equipment, and avoiding obsolescence.
- Making health condition data accurate, available and useful to prioritize critical work.
- Addressing backlogs in sustain investments and deferred maintenance.
- Balancing customer demand with the necessary outages to execute maintenance and replacement projects.
- Responding to evolving and increasing regulatory and compliance requirements.
- Addressing increasing physical and cyber hazards that put the transmission system at risk.
- Ensuring transmission operators have greater system visibility, more accurate models, and enhanced automated controls to maintain reliability.

Strategic Approach for Transmission Services Capital Program

BPA's transmission asset management strategy focuses on the capital investments necessary to achieve the long term goals of sustaining its existing infrastructure at desired performance levels while addressing the challenges listed above. The Transmission Asset Management strategy documents the specific approaches to be taken and places particular focus on overarching initiatives and the set of actions and prioritized capital investments to be implemented in the sustain programs. Expansion investments, driven by capacity and customer requirements, are prioritized against other agency expansion needs through BPA's Capital Investment Prioritization process.

- **Sustain** – For replacing existing assets, Transmission Services utilizes a risk-informed methodology to develop asset strategies and plans through the evaluation of total economic cost associated with equipment failure probabilities leading to outages and line derates. The total economic cost (TEC) results are collectively analyzed across sustain programs to prioritize replacements and produce an efficient frontier, which depicts the optimal funding levels for the lowest economic cost.
- **Expansion** – For expanding the system, Transmission Services' investments are prioritized using a net economic benefit ratio to determine the highest value investments to be implemented.

Transmission Direct Capital Forecast FY 2017-30



Program	FY17	FY18	FY19	FY20	FY21	FY22	FY23	FY24	FY25	FY26	FY27	FY28	FY29	FY30	Total FY17-30
Sustain	229	210	214	302	292	291	305	304	302	317	314	322	332	352	4,086
Expansion	144	107	96	154	181	191	136	117	115	115	115	115	115	117	1,818
Total Capital	372	317	311	456	473	482	441	421	417	432	429	437	447	469	5,904

Efficiency Improvements

Transmission Services is currently in the early stage of implementing several major strategic priorities. The System Infrastructure priority is focused on addressing the risks associated with the aging transmission infrastructure. Efforts to close gaps in capital project execution and asset management discipline led to the creation of the Asset Management and Program Delivery (AMPD), initiative in FY 2014, which is a major element for Transmission Services’ asset strategy. Specific efficiency improvements of this initiative are:

- Implementing technology enablers, such as creating portfolio management tools and enhancing the asset register for greater accessibility and visibility of higher quality asset data.
- Developing and integrating sustain program asset strategies using a standardized approach for identifying risks through an evaluation of total economic cost metrics.
- The creation of the project definition team in FY 2016 to enable more robust project scoping and stage gates, adding certainty to project cost and delivery.

- Establishing a portfolio management function to centrally manage and optimize the portfolio, which includes identifying, prioritizing, authorizing, managing and controlling projects, programs and other related work to achieve strategic business outcomes.
- Effectively managing change for all process improvements within the various impacted organizations.

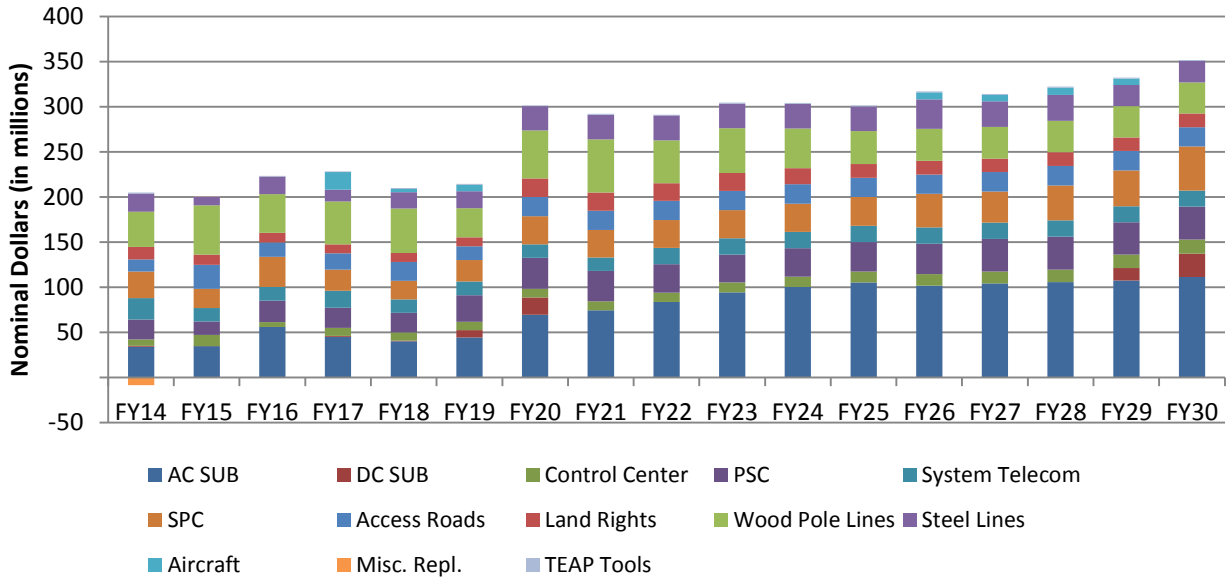
In addition to the improvement efforts in AMPD, there are also efficiency improvements that were identified during sustain strategy development that add value to the system and help reduce total economic costs. Some progress has been made in the power system control, system protection & control, remedial action schemes and alternating current substation programs on these efficiency improvements, but full implementation of all improvements relies on adequate expense funding. Improvements include:

- Pre-deployment testing, training and documentation for power system control.
- Predictive analysis using cameras, sensors and monitors in substations.
- Circuit breaker and transformer Electric Power Research Institute asset management tools to provide advanced analytics on maintenance and reliability.
- Maintenance expense pilot for access roads and an engineering-driven expense pilot for lines.

Sustain Asset Capital Levels

To develop its proposed capital levels for the Sustain program, Transmission Services identified two levels of capital spending: a “base” level that would address system needs and an “optimal” level that would allow Transmission Services to reach steady state for high value critical replacements within the next 10–15 years. BPA is proposing using the “base” levels. The sections below describe the risks with this approach.

Sustain Capital - Base
 Capital FY 2014-15 Actuals and FY 2016-30 Base Levels (Preliminary)

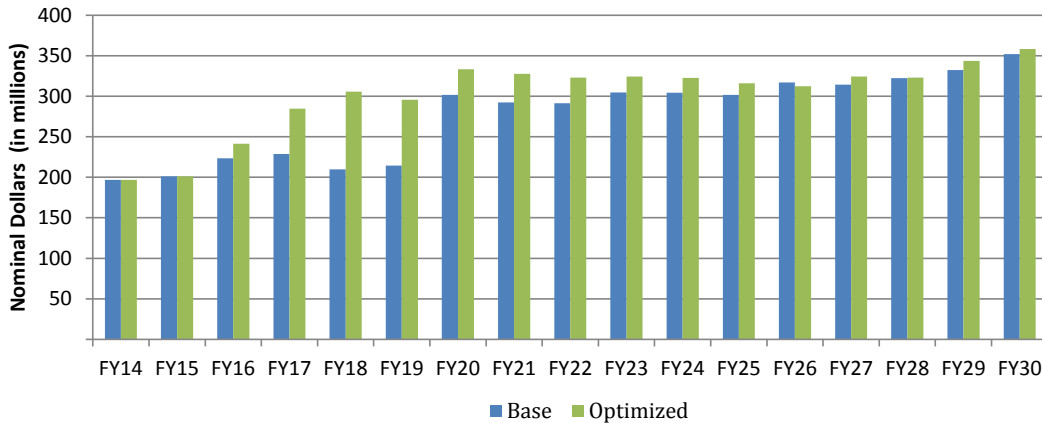


Sustain Program (\$M)	Actuals		EOY Forecast	CIR Forecasts														Total FY17-30
	FY14	FY15	FY16	FY17	FY18	FY19	FY20	FY21	FY22	FY23	FY24	FY25	FY26	FY27	FY28	FY29	FY30	
Base Capital	197	201	223	229	210	214	302	292	291	305	304	302	317	314	322	332	352	4086

Risks to Implementing the Strategy

The base capital levels for FY 2017-19 are predicated on FY 2014 CIR levels, which only included total economic cost strategies and models for System Protection Control and Power Systems Control programs. Total economic cost strategies and models for AC substations, steel lines, wood pole lines, access roads and control center programs were completed in FY 2015. For FY 2017-19 the base capital levels are approximately \$230M less than the optimized levels. The FY 2020-30 base levels attempt to ramp back to align with the optimal strategy levels.

Sustain Capital Base vs. Optimized Forecast Comparison



By funding at the lower base levels in the near term, reaching a steady state for high value critical replacements in the next 10-15 years is at risk. As a result, corrective maintenance costs may increase and the backlog will continue to grow. AC substations, one of the most critical programs identified from the total economic cost strategies, is currently working to address the approximate \$800 million backlog of equipment beyond its expected lifecycle. From FY 2014-15, the AC substations program had 75 emergencies, including major failures in critical and costly assets such as reactors and transformers, and this number is expected to continue to grow until a steady state is reached. Based on the current funding trajectory of the sustain capital spending level, 10-20 percent of the sustain capital spending level is projected to address emergencies and unplanned work, per an assessment conducted by the Strategic Decisions Group in October 2015.

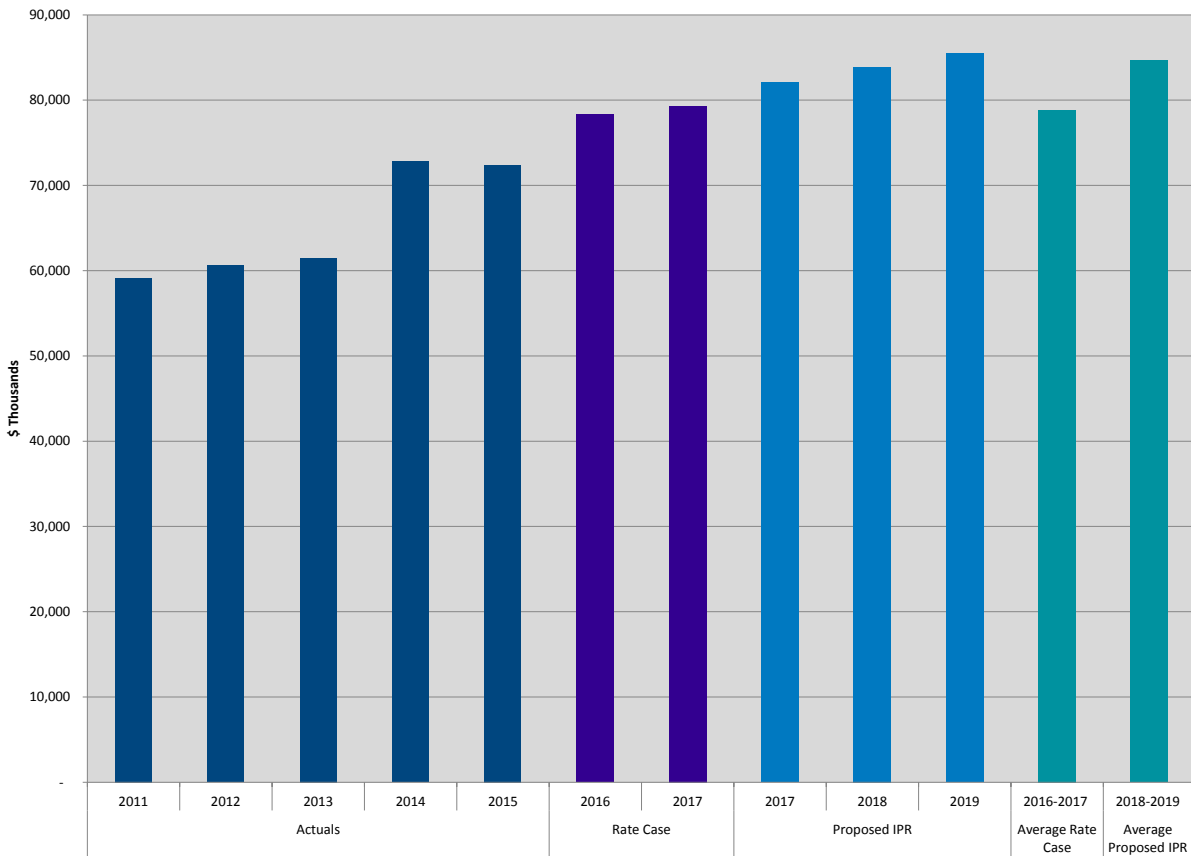
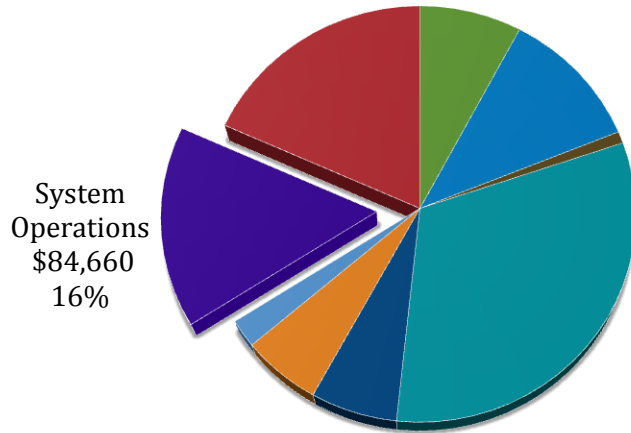
Another example of risk to the system based on current funding levels is the potential for an increase in fiber outages. In FY 2015, BPA experienced 30 fiber outages as compared to the average of 10 per year from 1999-2009. Analysis has shown 40 fiber outages per year means BPA can expect two simultaneous fiber outages on the same ring, which is almost certain to result in transmission curtailments. This in turn would mean a reduction of load that can be served and reduction of generation allowed on the system; both of which would reduce revenues and damage reputation. Under the base levels in the short term, only 100 miles of fiber can be replaced per year, when the system need has been determined to be 150-200 miles to mitigate outage risks.

Given BPA’s commitment to managing cost in the near term, the capital program has been prioritized to minimize risk on the most critical assets with the proposed levels of funding.

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4.2 System Operations

FY 2018-19 Average: Proposed IPR Costs



Program Details

(\$Thousands)	Actuals	Rate Case		Proposed IPR		
	2015	2016	2017	2017	2018	2019
Information Technology	8,103	10,377	10,558	5,768	6,004	6,095
Power System Dispatching	13,209	13,536	13,671	15,791	16,082	16,376
Control Center Support	20,849	18,572	18,757	26,808	27,187	27,524
Technical Operations	6,288	6,913	6,983	7,543	7,727	7,932
Strategic Integration	585	7,522	7,555	1,358	1,404	1,447
Substation Operations	23,347	21,399	21,817	24,786	25,452	26,091
Grand Total	72,381	78,319	79,341	82,055	83,855	85,466

Description, Purpose and Responsibilities

Information Technology: This sub-program implements and maintains non-grid operations automation solutions to meet Transmission Services' business needs, including asset information and management systems, Fiber Information and Management Systems, geospatial solutions, and Work Scheduling systems.

Power System Dispatching: This sub-program provides for the operation and management of two regional control centers providing dispatch and control services. As the Balancing Authority and Transmission Operator, this program monitors and manages the integrated power system to ensure the safe, reliable and compliant operation including directing real-time actions during normal, planned and emergency conditions. This program also provides outage coordination for internal BPA and external stakeholders and provides training programs to maintain NERC certified dispatch staff.

Control Center Support: This sub-program provides full life-cycle support of control center assets used for the secure and reliable operation and control of the interconnected transmission system. This includes 24/7 monitoring of Control Center automation and the system-wide communications network which provides visibility and control of transmission assets. The support activities include planning, engineering, design and build, project management, and O&M of control center assets and infrastructure, including vendor support (i.e. software licenses and maintenance and service requirement). This sub-program also provides necessary control center implementation of and compliance with cyber and reliability regulatory standards, including National Institute of Standards and Technology (NIST), Federal Information Security Management Act (FISMA), Critical Infrastructure Protection requirements described under NERC/Western Electricity Coordinating Council Compliance, Operating Information Collaborative.

Technical Operations: This sub-program supports the optimal uses of the interconnected transmission system by studying allowable ranges of safe facility, stability and voltage operating limits, determining path total transfer capability values, and providing operating and mitigation plans and specialized technical expertise in support of the real-time operation. It provides outage coordination support, and operational technical oversight for crucial transmission reliability functions such as Remedial Action Schemes, Automatic Generation Control, balancing reserves, intermittent resource integration, and disturbance monitoring and event reporting systems.

Strategy Integration: This sub-program is the management of specific cross-agency strategic initiatives. Additional information is in the Corporate Strategy summary in the Agency Services section of this publication.

Substation Operations: This sub-program provides support for substation inspections, switching and clearance procedures, control of access to energized facilities in the field, overall physical security of the substations, first response to transmission system events and emergency outages, safety response, and coordinating initial outage planning and outage requests to the central outage office.

Goals

System Operations sub-programs continue to focus on the safe and reliable operation of the transmission system. A majority of the sub-programs are positioning to support BPA agency and regional strategic initiatives, including evolving market structures.

Information Technology: The long-term objective is to develop and maintain a reliable and secure set of applications that meet Transmission Services' business needs. Near-term goals include prioritizing and delivering solutions based on the highest business value, which includes the evaluation and deployment of cloud-based SaaS solutions where appropriate.

Power System Dispatching: This sub-program goal is to operate a safe, reliable and compliant interconnected transmission system; provide dispatcher training to meet and maintain NERC certification; continue improvements in outage coordination; and proactively manage the impacts of emerging markets on reliability.

Control Center Support: This sub-program goal is to continue to provide high reliability automation in support of the operation of the control centers while continuing to mature the cyber compliance posture and provide new tools to Power System Dispatching to support increased situational awareness and management of a changing transmission system.

Technical Operations: This sub-program goal is to continue to provide operational technical expertise to ensure reliable operation of the interconnected transmission system in compliance with NERC and WECC reliability standards; contribute to regional collaboration and emerging industry practices and continue to improve analytical and study processes.

Substation Operations: This sub-program goal is to improve continuity of substation operations including field operation inspections and substation and equipment security, switching and clearance responsibilities, capability as first responders to transmission system problems, effective resolution of real-time technical transmission and safety issues, and current and emerging policy, procedure and work standards support.

Changes from the 2014 IPR

System Operations established a new function (people, processes, and tools) to provide 24/7 engineering support improving real-time transmission system awareness and responsiveness to contingencies. Implemented a reorganization to create focus and responsibility in needed areas such as operational performance, compliance management, strategic and project support, and outage coordination. A new Transmission technology organization has been proposed to consolidate the governance and responsibility for operational technology and IT including automation responsibilities in support of the control centers.

Information Technology: The drivers impacting this sub-program include: (1) improving Transmission's asset information management in conjunction with the associated Agency initiatives; (2) improving Transmission Commercial Operations systems in conjunction with the associated Agency initiatives; (3) improving Business Information Systems in conjunction with the associated Agency initiatives; and (4) addressing evolving compliance requirements.

Power System Dispatching: This sub-program continues to address increasing compliance with current and emerging NERC regulatory requirements, including new approaches for dispatchers. As Peak Reliability continues to mature it drives new initiatives, requiring collaboration including efforts in outage coordination and inter-regional flowgate management (IROLs). The increased use of improvements in operating protocols including congestion management for real-time and future periods, and operationalizing synchrophasor data.

Control Center Support: Changes to this sub-program include implementation of current and emerging NERC and federal cyber-security requirements. Increased cyber-security requirements are driving the addition of tools and capabilities in the control centers and in the field and the expansion of monitoring capabilities through the Network Operations Center and the Systems Operations Center. The transition from traditional control center systems to a more IT-centric infrastructure has resulted in increased vendor costs, annual software licensing and maintenance service fees. Improvements to flow forecasting capabilities for congestion management tools; and integration of maturing synchrophasor technology, power system situational awareness capability, RAS automation, and support for Optical Multi-Gigabit Ethernet Transport are also added.

Technical Operations: Changes to the Technical Operation program include alignment with Peak Reliability System Operating Limit and Outage Management Methodologies; implementation of 24/7 day shift study engineers group; initiatives to measure real-time frequency response uses; regional collaboration on initiatives for reliable operations, including monitoring and tracking RAS obligations and arming performance; expanding dynamic transfer capability limit assessments to all paths and network paths; and advancing capability for calculating real-time system operating limits.

Substation Operations: Changes to the Substation Operations include continuing improvements to Human Performance, monitoring, tracking, and reporting on error reduction, and responding to increased physical and cyber- security compliance requirements.

Risks of Operating at Levels below the Proposed Spending Levels

Reduced funding for System Operations programs could focus priority on core functions and maintaining current tools, processes and systems; loss of flexibility to integrate or adapt to emerging agency and external initiatives, such as non-wire alternatives, and market initiatives; affect compliance with NERC or Federal mandatory reliability and cyber regulations and standards; increase system reliability risks; and loss of benefits to the agency and region if BPA's significant investment in emerging technology (e.g., synchrophasors) is not fully utilized due to lack of funding for maintenance support.

Information Technology: Automation helps BPA meet evolving business needs and compliance requirements, improve workflow and cost efficiency. Risks associated with reduced funding include reduced ability to respond to unforeseen compliance or business requirements.

Power System Dispatching: Reduced funding for this sub-program will affect BPA's ability to maintain core power system dispatching functions, and put the operation of the interconnected transmission system at reliability and business continuity risk. BPA operations would be at status quo levels and not evolve; dispatcher training including on emerging tools for monitoring system awareness, sufficient RAS generation dispatcher coverage in each control center, and effective outage coordination for BPA internal and external stakeholders would not be available, leading to risk of non-compliance with mandatory reliability standards.

Control Center Support: Reduced support for this sub-program will compromise BPA's ability to operate and maintain control center assets, and monitor and manage systems and tools comprising the network (e.g., AGC, SCADA, synchrophasors) and telecommunications system infrastructure (e.g., fiber, microwave system, RAS) used to control the interconnected transmission system. It will also limit tools, systems and processes needed to ensure backup capability between the control centers. Appropriate monitoring and management of control center assets, including for cyber security risks, requires tools and systems, including access to necessary spare parts, and preservation of software licenses and maintenance requirements.

Technical Operations: Reduced funding will affect BPA's ability to maintain core technical functions. Changing and increasing dynamic uses of the interconnected transmission system must be studied to meet reliability and regulatory requirements and risk non-compliance. Reductions will also affect BPA's ability to provide necessary technical support for RAS, AGC, balancing and reserve requirements and deployment, continuity of operations during critical events, and ability to respond to changing and emerging areas, including access to dynamic transfer capability.

Substation Operations: At reduced funding levels substation operator apprenticeship, training and certification programs and development of work standards and technical field operations procedures addressing emerging practices and standards would be impeded, including responsibilities for new initiatives and regulations.

Challenges/Constraints

Information Technology: Challenges facing the IT sub-program include an industry trend towards cloud-based solutions, new operations and maintenance expenses associated with new systems, and new compliance requirements. Other challenges include the integration of new technologies.

Power System Dispatching: Challenges affecting this sub-program include staffing, equipment and workload pressures associated with the evolving mandatory compliance landscape, changes to BA and TOP roles and responsibilities including training on emerging situational awareness and congestion management tools, and support for emerging BPA and regional strategic initiatives to integrate evolving market structures that enhance the safe and reliable operation of the interconnected transmission system.

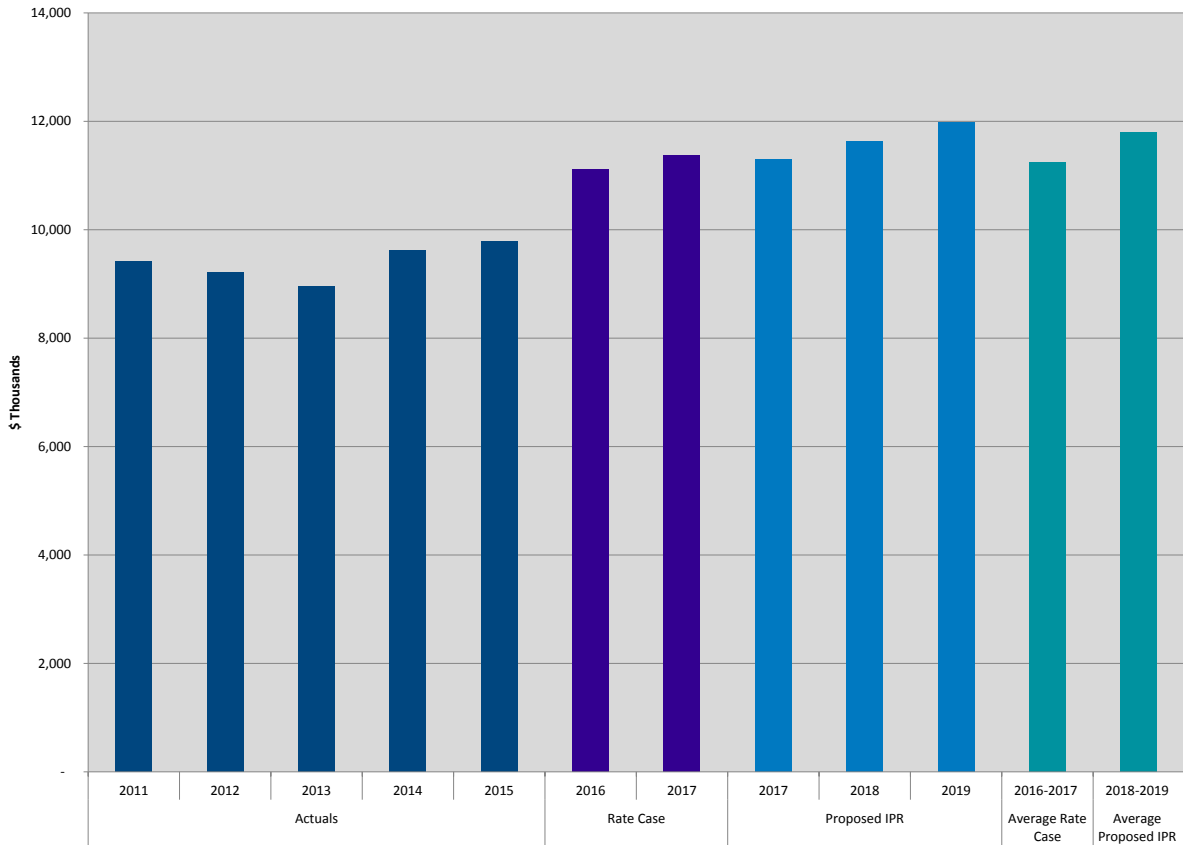
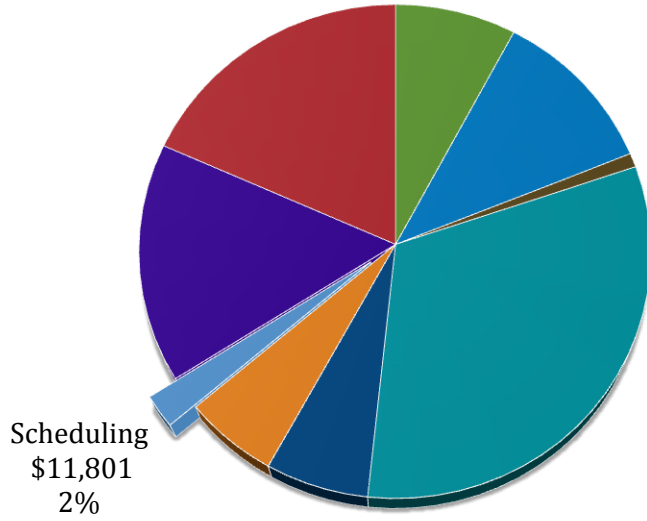
Control Center Support: Significant challenges for this sub-program include escalating costs and workload necessary for compliance with changing standards and regulations; software licensing cost increases; changing RAS program requirements; increased pressure operation and maintenance of control center assets resulting from capital program shifts; and demands to support the development and O&M of systems and tools to accommodate emerging BPA and regional initiatives including market initiatives, BPA's long-term balancing reserve strategy, and demand response initiatives.

Technical Operations: Technical Operations challenges include increased compliance requirements for evolving NERC standards, escalating staffing and workload needs to conduct studies for a range operating horizons and conditions, emerging market structural changes leading to new and varied operating conditions, and the emergence of new frequency response reserves regulatory and market requirements.

Substation Operations: Substation Operations' challenges and constraints include staffing, succession planning, and workload necessary to implement mandatory NERC, WECC and Federal compliance initiatives, including physical and cybersecurity improvements required by regulatory requirements.

4.3 Scheduling

FY 2018-19 Average: Proposed IPR Costs



Program Details

(\$Thousands)	Actuals	Rate Case			Proposed IPR		
	2015	2016	2017	2017	2018	2019	
Reservations	1,156	1,362	1,383	1,564	1,598	1,638	
Pre-Scheduling	344	268	276	416	426	442	
Real-Time Scheduling	4,323	5,038	5,169	4,736	4,888	5,052	
Technical Support	3,732	4,161	4,259	4,056	4,168	4,291	
After-the-Fact Scheduling	237	281	289	525	542	558	
Grand Total	9,792	11,110	11,376	11,296	11,621	11,981	

Description, Purpose and Responsibilities

BPA's Transmission Scheduling program provides overall management of transmission scheduling, reservation transaction processing and analytical support for long-term and short-term sales of transmission services consistent with BPA's Open Access Transmission Tariff, business practices and procedures. BPA's Transmission Scheduling Program has the following sub-programs:

Reservations: This sub-program consists of the Reservation Desk and Capacity Desk functions. The Capacity Desk coordinates and posts system outages according to published timelines, consistent with Transmission business practices and BPA's OATT. The Reservation Desk function performs the following activities:

- Manages available long-term transmission capacity inventory and conducts analysis to determine whether Transmission Service Requests can be granted.
- Runs long-term market competitions; provides customer support for transmission service requests and the Open-Access Same-Time Information System (OASIS).
- Manages the information posted on BPA's OASIS related to known constraints that result in a limitation on commercial transmission paths.
- Implementation of business practices and commercial products and services.

Pre-Scheduling: This sub-program performs the following activities:

- Conducts sales and scheduling of transmission for next-day(s) operations per the WECC pre-schedule timeline.
- Conducts analysis to determine whether specific transmission requests can be granted.
- Assists customers with questions about their transmission service requests.
- Operates BPAT's OASIS during the WECC pre-schedule timeline.
- Ensures that checkouts with adjacent Balancing Authority Areas are accurate and timely, and that day-ahead energy and transmission levels are balanced.

Real-Time Scheduling: This sub-program performs the following activities:

- Scheduling of transmission services for next-hour and intra-hour delivery.
- Curtails schedules in-hour as system conditions require.
- Develops, operates, and maintains systems and processes that support congestion relief.

- Ensures that hourly and sub-hourly checkouts with adjacent Balancing Authority Areas are accurate and timely, and that hourly and intra-hourly energy and transmission levels are balanced.
- Provides after-hours operations for posting operating capacity, managing OASIS transactions, and transmission scheduling issue resolution.

Technical Support: This sub-program performs the following activities:

- Conducts technical analysis of scheduling operations to ensure compliance with external federal regulations, and BPA business practices.
- Facilitates the development, implementation and support of capabilities within the Transmission Scheduling program.
- Works with IT providers, internal groups, regulatory organizations and customers to implement changes to the software in order to comply with new regulations and/or accommodate changes to BPA business practices.
- Establishes and documents policies, processes, procedures and guidance to support the other functions within Transmission Scheduling.

Scheduling After-the-Fact: This sub-program is responsible for verifying net scheduled and net actual interchange, and investigating and resolving discrepancies.

Goals

Reservations: This sub-program has the following goals:

- Maintain compliance with Tariff.
- Implement long-term ATC strategy and business practices.
- Run the cyclical ATC base case models.
- Continue to improve the ATC Long-Term Management tool.
- Participate in North American Energy Standards Board committees that require BPA to look at changing the way we currently do business.

Real-Time Scheduling: This sub-program has the following goals:

- Improve systems and processes to more effectively support alternative resource initiatives, manage network flowgates, develop commercial and operational system changes related to scheduling for regional and BPA initiatives, which include non-wire solutions, NITS, current and emerging NERC and WECC standards, and support the enhanced BPA Balancing Authority obligations to enable customers to participate in energy imbalance markets.
- As necessary, implement new and revised services to support BP-18 rate case outcomes (for example, implement any changes to services)
- Develop additional real-time scheduling competencies, including a formal training program to support the development of a skilled workforce to implement increasingly complex scheduling practices in compliance with mandatory reliability standards.

- Maintain and improve concurrent transmission scheduling system operations at the Dittmer and Munro Scheduling Center facilities.
- Ensure all scheduling functions are NERC, WECC, NAESB, and FERC compliant.
- Provide adequate staffing for the Munro Scheduling Center and Dittmer, including additional real-time scheduler positions.

Technical Support: This sub-program has the following goals:

- Participation in multiple national standards development with NAESB Standards Board, including OASIS and other commercial business standards that will require BPA to adjust to industry changes.
- Develop comprehensive business requirements more effectively to meet customer needs; facilitate customers participation in energy imbalance markets; increase access to markets and utilization of unused/available transmission to allow BPA to leverage product offerings and system flexibilities potentially provided by bilateral markets.
- Ensure that the Commercial System Infrastructure remains compliant with FERC, NERC, WECC and NAESB standards.
- Ensure that the Commercial Systems Infrastructure adheres to BPA's OATT
- Integration of new tools and processes to support the development and implementation of tariff initiatives (i.e., implementation of Network Integration Transmission Service on OASIS).

Changes from 2014 IPR

Reservations: This sub-program had the following changes since the 2014 IPR:

- Updated the ATC Long-Term Management tool.
- Implementation of NITS-NAESB that meets the Tariff and NT customer needs.
- Ran the cyclical study cycles and GI models and work to integrate with other regional planning processes.
- Increased Conditional Firm inventory availability to long-term market.

Technical Support: This sub-program had the following changes since the 2014 IPR:

- Implementation of 15-Minute Scheduling.
- Implementation of the short-term firm network product, which allows NT customers to purchase firm transmission on a short-term basis to meet load.
- Completed 7-FN tagging for Network Integration - to support NT re-dispatching NERC reliability standards - mandated changes in ATC methodology.
- Implementation of Electric Industry Data Exchange notification of changes in Total Transfer Capability for shared path owners.
- Addition of flowgates to address sub-grid issues.
- Implemented NITS, Phase 1.

Risks of Operating at Levels below the Proposed Spending Levels

BPA's Scheduling program has committed to manage within our allocated spending levels and absorb the costs of implementing the commercial non-wire solution. Lower-than-requested funding for the Scheduling program will create challenges or delays in the implementation of reliability standards and of commercial activities. The following initiatives could have implementation challenges or delays:

- Implementation of flowgates, congestion management provisions, rate case initiatives and core activities to support mandatory compliance with reliability.
- Implementation of the Transmission System Request Study and Expansion Program, TLS, CAISO EIM, and CAISO Framework Program.
- Automatic posting of TLS customer forecast information to OASIS could be delayed, as well as full implementation of NITS. Based on the complexity of NITS, it could require additional resources not anticipated.
- Delay in maintenance of BPA's current scheduling automation systems to their performance limits due to an increase in e-Tag volume.
- Succession planning for retirement of staff with critical knowledge and expertise.

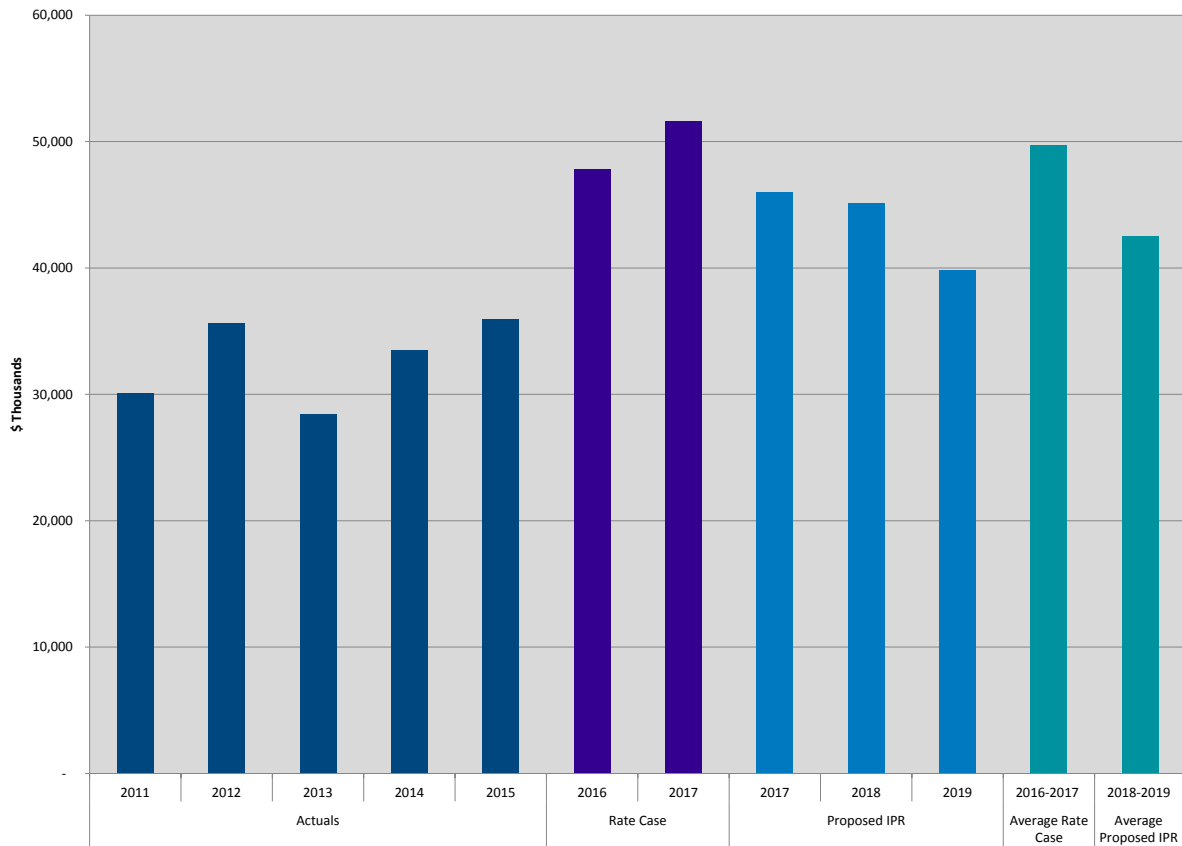
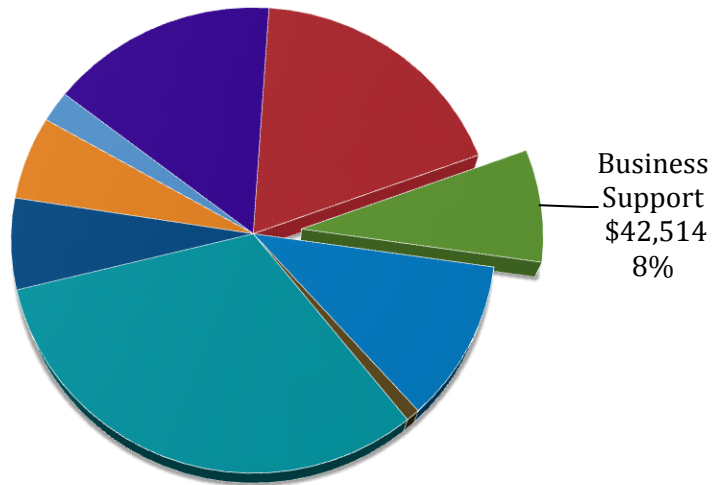
Challenges and Constraints

The vast majority of BPA's Scheduling program spending level is to cover personnel compensation and benefits cost.

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4.4 Business Support

FY 2018-19 Average: Proposed IPR Costs



Program Details

(\$Thousands)	Actuals	Rate Case		Proposed IPR		
	2015	2016	2017	2017	2018	2019
Executive and Administrative Services	12,727	24,235	27,540	23,035	22,679	17,009
Legal Support	2,250	3,331	3,548	1,641	1,716	1,792
General Administrative	12,913	12,961	13,135	13,716	12,824	12,934
Aircraft Services	1,234	2,205	2,230	3,003	3,032	3,060
Logistics Services	5,598	4,325	4,488	3,968	4,266	4,415
Security Enhancements	1,201	754	716	630	644	658
Business Support	35,922	47,811	51,657	45,993	45,160	39,868

Description, Purpose and Responsibilities:

Executive and Administrative Services: Transmission Services Management including executive and manager labor, outplacement training, and student tuition assistance and travel. Expenses in this program are primarily from the Transmission organization.

Legal Support: The Office of General Counsel provides legal advice and representation for all BPA activities. It charges directly to Power and Transmission Services when supporting projects for those business units. Costs in support of general BPA initiatives and activities are also allocated to Power and Transmission. See the complete Legal summary in the Agency Services section of this document.

Internal General and Administrative Services: Provides support for Transmission Services, including training, Office Workers Compensation, awards, efficiency projects, strategic performance management, OMB circular A-123 compliance, business case support, benchmarking, and lessons learned.

Aircraft Services: This sub-program provides aviation support to ensure the reliability of the transmission system. BPA's fleet consists of two fixed-wing aircraft, four rotary wing aircraft, flight crews, aerial observers, mechanics and a scheduler. The fleet is used to transport employees to support the transmission system and to monitor the condition of the power grid.

Logistics Services: Provides Supply Chain Services logistics services required to support Transmission Services, including procurement, materials management, supplemental labor management and logistics services, while ensuring ethical, risk-appropriate business practices that are compliant with internal controls. Supply Chain Services is an Agency Services organization; the logistics services it provides are charged directly to Transmission. See the complete SCS summary in the Agency Services section of this document.

Physical Security Enhancements: Protects critical transmission assets by conducting security system performance testing, security risk assessments, coordination and liaison with local, state, and federal law enforcement, and management and oversight of capitalized physical security projects at critical transmission sites. Security Services are provided jointly by the Transmission Field Services organization and by the Office of Security and Continuity, an Agency Services organization. OSCO is responsible for the design and implementation of a security infrastructure

that complies with ever-evolving regulatory requirements while balancing the operational needs and acceptance of infrastructure owners such as Transmission Services. See the complete Security summary in the Agency Services section of this document.

Goals

Executive and Administrative Services: One key goal of this sub-program is to recruit highly-qualified students who may later fill the jobs of retiring BPA employees. This succession program allows Transmission Services to rotate and train students in Transmission functions and prepare them for full-time employment as retirements create vacancies.

Internal General and Administrative Services: Goals of this sub-program include ongoing support for Business Management applications as well as Strategic Performance Management to support the accomplishment of Agency and Transmission key performance targets.

Aircraft Services: The goal for this sub-program is to provide aerial support to meet emergency call-outs with a 90 percent aircraft operations scheduling effectiveness rate.

Changes from 2014 IPR

Internal General and Administrative Services: Starting in FY 2014, the Internal General and Administrative Services included Strategic Priorities development and implementation. The project has identified key outcomes for four Transmission strategies: System Operations, System Reliability and Compliance, System Infrastructure, and Commercial Success. The Strategic Priorities have a desired end-state of 2018.

Aircraft Services: This sub-program has implemented a new scheduling program that allows multiple users to take advantage of trips that have empty seats, lowering the cost per flight hour.

Risks of Operating at Levels below the Proposed Spending Levels

Internal General and Administrative Services: The decision to reduce funding for the Strategic Priorities during the FY 2018-19 rate period may result in lost opportunity to make key business process, system infrastructure, reliability and compliance, and system operations improvements.

Aircraft Services: Funding for the acquisition of an updated fleet of aircraft has been requested in the 2016 CIR. Should the 2016 CIR funding not be approved, the \$1.5 million cost to overhaul the engines in one fixed wing aircraft and to upgrade the entire fleet to meet an Federal Aviation Administration-mandated avionics and navigation systems requirement will be expensed during the 2016-18 IPR rate period. If the existing fleet is not upgraded or replaced by 2020, it will be grounded.

Challenges/Constraints

Executive and Administrative Services: The primary challenge facing the Transmission Student Program is competing with outside industry for highly-qualified students.

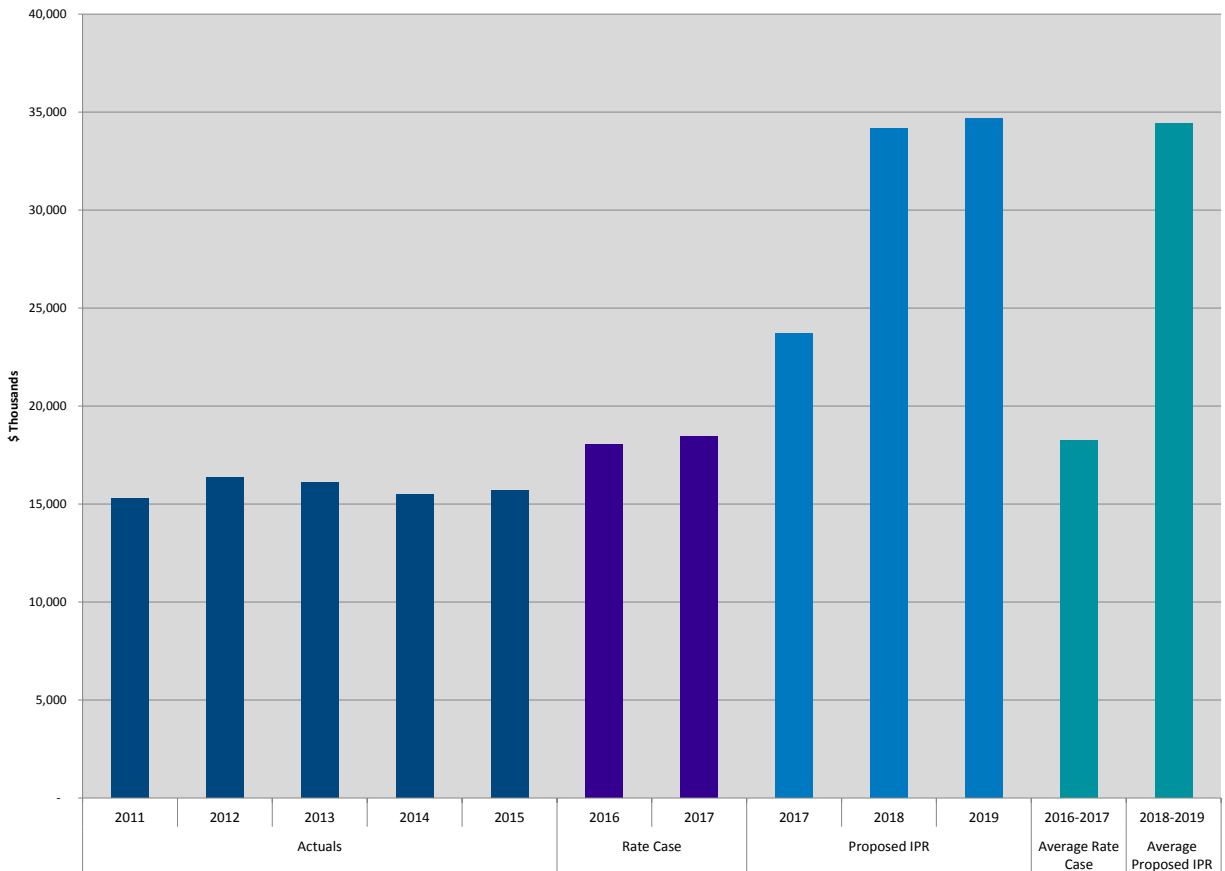
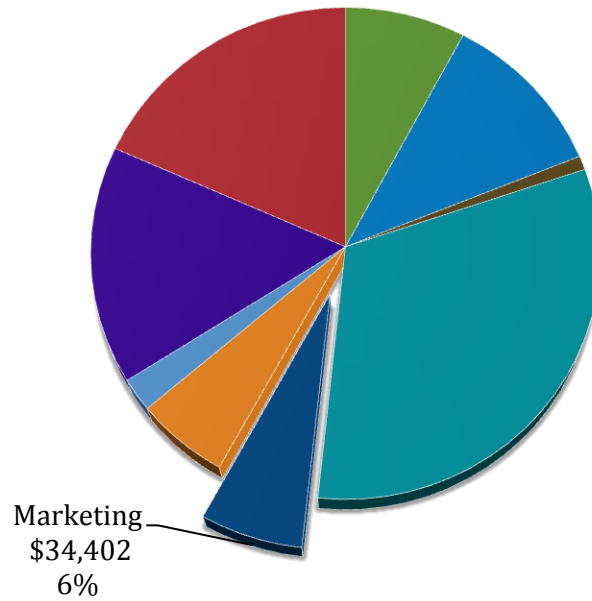
Internal General and Administrative Services: Continued Business Management and Strategic Performance Management support is needed to address management systems and implement a responsible, integrated, coordinated approach to continuous improvement. Lack of an integrated approach to continuous improvement degrades both the effectiveness and efficiency of Transmission's improvement efforts and creates additional corrective actions and rework.

Aircraft Services: This sub-program faces the following challenges and constraints

- Maintenance for the fixed-wing aircraft is mandated by the FAA; reduced funding would put the use of the aircraft at risk, resulting in inability to meet the needs of BPA staff and executives.
- Maintenance for the rotary -wing aircraft is mandated by the FAA; reduced funding would put the use of the aircraft at risk, resulting in inability to meet the needs of BPA staff and place WECC mandated power line inspection requirements in jeopardy of not being completed.

4.5 Transmission Marketing

FY 2018-19 Average: Proposed IPR Costs



Program Details

(\$Thousands)	Actuals	Rate Case		Proposed IPR		
	2015	2016	2017	2017	2018	2019
Transmission Sales	2,354	2,700	2,775	3,430	3,526	3,627
Contract Management	4,244	4,862	4,984	4,728	4,897	5,066
Transmission Billing	2,414	3,301	3,377	2,433	2,518	2,611
Business Strategy and Assessment	6,687	7,171	7,291	13,099	23,195	23,364
Grand Total	15,698	18,033	18,426	23,689	34,136	34,668

Description, Purpose and Responsibilities

The Transmission Marketing program provides frontline customer service and support by negotiating, updating and managing contracts, responding to customer issues and inquiries, and revising and establishing BPA policies and business practices in response to changing market needs and compliance responsibilities. These activities include:

- Provides open access to the federal transmission system consistent with the Open Access Transmission Tariff.
- Leads the development and administration of long-term and short-term transmission services agreements.
- Provides ratemaking and margin management for BPA's transmission marketing and sales efforts including market intelligence, research, analysis, and support for the establishment of cost and revenue targets.
- Manages the reservation and sale of all transmission services associated with the OATT in a nondiscriminatory manner and ensures commercial compliance oversight and direction for all transmission commercial functions.
- Leads the Transmission System Expansion Process, business practice and policy development processes.

The Transmission Marketing program includes the following sub-programs:

Transmission Sales: This sub-program leads the negotiation, development, and administration of long-term and short-term transmission service agreements. Account Executives are the primary point of contact for BPA transmission customers.

Marketing Contract Management: This sub-program provides expertise and support to the AEs for transmission customer issues including contract development and finalization, quality control review of transmission contracts, analysis, customer issue resolution and front-office contract administration.

Marketing Business Strategy and Assessment: This sub-program provides leadership and direction in formulating business rules and strategies in support of BPA's governing practices, consistent with regulatory requirements, federal law, and BPA's OATT. This sub-program consists of the Transmission Policy Development and Analysis function and the Business Assessment function. The Transmission Policy Development and Analysis function develops, analyzes and implements the business practices and policies associated with BPA's marketing and sale of transmission and ancillary services.

The Business Assessment function develops, facilitates workshops and implements rates for transmission and ancillary services, generates revenue forecasts for BPA Transmission Services, provides market research on business fundamentals driving sales of transmission capacity, and conducts quantitative and business analysis in support of commercial business transactions.

Goals

Transmission Sales: This sub-program has the following goals:

- Achieve customer satisfaction ratings of > 7.0, supporting BPA's ability to succeed in the highly competitive market for wholesale electric power and Transmission services.
- Work with BPA's external customers to resolve customer issues and inquiries, participate in meetings, and efficiently execute and tender contracts.
- Implementation of national standards developed by NAESB, including OASIS and other commercial business standards, as required.
- Ensure that AE teams are staffed to efficiently meet the business needs of more than 300 customers. AE teams include staff representation from BPA's planning, operations, policy, contract development, customer service engineering, compliance, and risk groups.
- Business implementation responsibilities include NERC standards, implementation of NITS/NAESB in compliance with applicable regulations, supporting the cyclical TSEP and GI model, integration with other regional planning processes, and Energy Quarterly Reporting to FERC.

Marketing Contract Management: This sub-program has the following goals:

- Implementation of national standards developed by NAESB for OASIS and other commercial business regulatory processes, as required.
- Maintain agency Contract System Automation requirements, including implementation of the Customer Information Service Delivery systems.
- Policy development to reflect NERC, NAESB, and FERC requirements.
- Improve data quality management process for contract development.
- Review and conversion of approximately 450 legacy O&M agreements.
- Ensure continuity in staffing and expertise to maintain forward momentum on key issues, including contract development and customer service.
- Management of the Reservation Agent process, Fees and Deposits.

Marketing Business and Strategy Assessment: This sub-program has the following goals:

- Provide policy assistance on issues ranging from ATC management and inventory to generation or load interconnections to TSEP, and is responsible for managing and maintaining the OATT consistent with regulatory guidelines.
- Provide leadership in ancillary services (such as the provision of balancing reserves) policy and specifications development.
- Oversee development and analyses of rate cases.
- Participate in national standards development with NAESB, including OASIS development.
- Lead customer outreach efforts, including quarterly customer forums, commercial non-wire initiatives, commercial operations, and other meetings.
- Planning for and implementing changes to BPA processes or systems to facilitate the integration of the Northwest parties into the CAISO EIM.

Changes from 2014 IPR

Transmission Sales: This sub-program had the following changes since the 2014 IPR process:

- Various initiatives to address compliance requirements pursuant to NERC reliability standards and BPA's OATT.
- Development of a regional planning strategy that incorporates an EIM.

Marketing Contract Management: The only change in this sub-program since the 2014 IPR process is the contractual implementation of BPA's policy on over-generation supply.

Marketing Business Strategy and Assessment: This sub-program had the following changes since the 2014 IPR:

- Analyzed additional BPA policies and business practices to ensure consistency in the way BPA conducts business on the Intertie and Network systems.
- Develop strategy and implementation plans to manage the impact on BPA's systems and customers of the CAISO and their energy imbalance markets.
- Develop commercial non-wires strategy.
- Develop comprehensive products and services to more effectively meet regional load service needs.
- Implement the TSEP cluster study process.
- Coordination of Oversupply Management Protocol.
- Enhance exploration of alternatives such as non-wires, demand-side management, new products, etc., to meet regional load growth needs.

Risks of Operating at Levels below the Proposed Spending Levels

Transmission Sales

The following is at risk:

- Customer satisfaction goals at risk due to inability to implement initiatives that benefit customers.
- Ability to develop new business practices in response to compliance and business needs.
- Contract negotiations for legacy contract conversions.
- Resolution of billing and settlement issues.
- Participation in ongoing system upgrade and replacement discussions.
- Implementation of NITS/NAESB standard.
- Development of strategies for CAISO and its energy imbalance market.

Marketing Contract Management

- Implementation of new business requirements.
- Implementation of NITS on OASIS NAESB standards.
- Succession planning/workforce development.
- Develop new business practices in response to compliance and business needs.

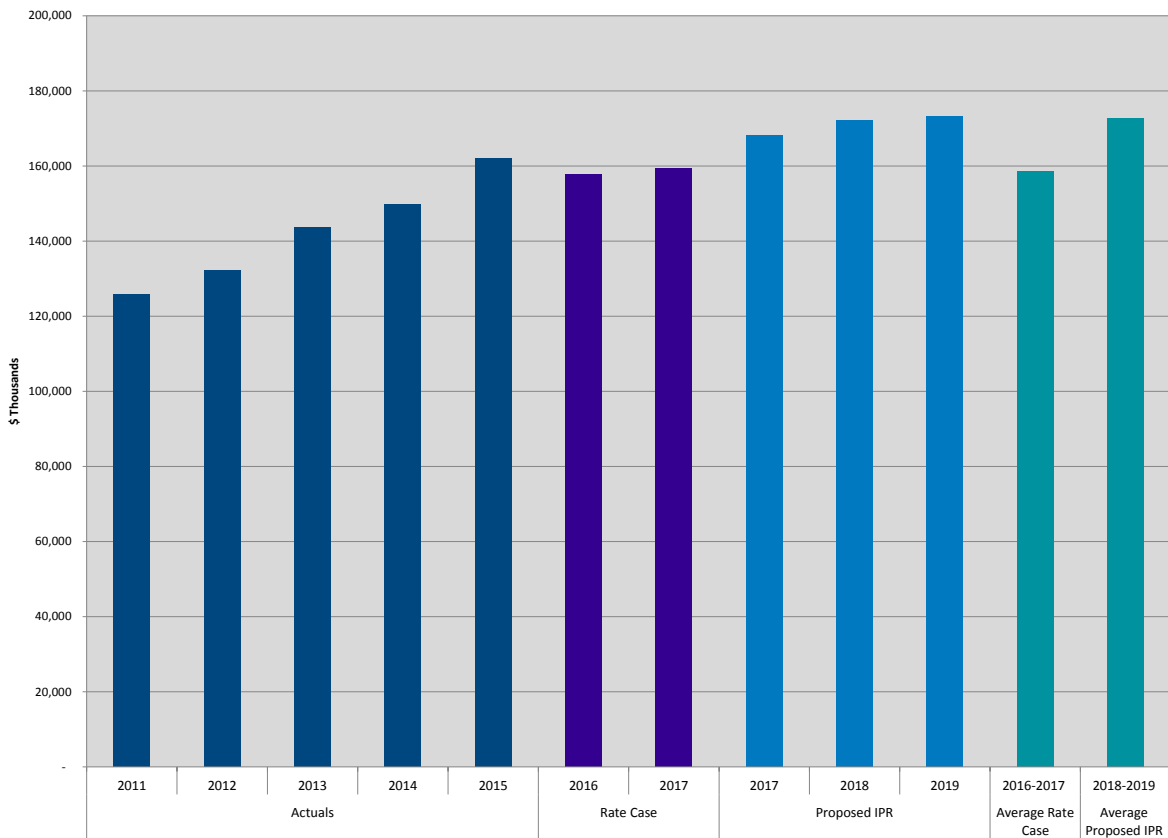
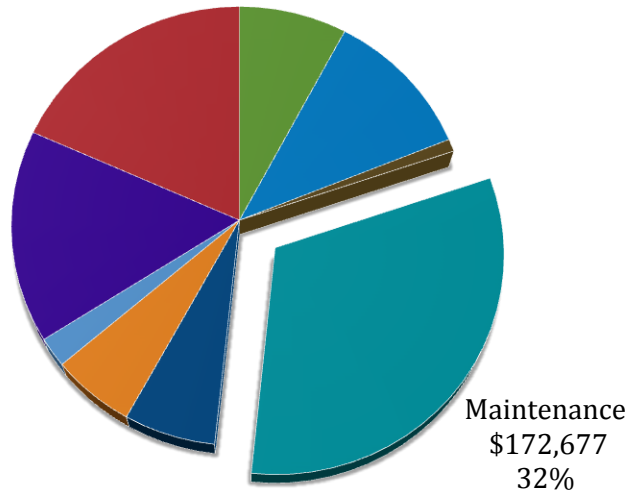
Marketing Business Strategy and Assessment

- Loss of revenue if customer needs are not met.
- Risks of reduced funding for re-dispatch, including increased congestion, customer curtailments, and non-compliance with the tariff requirements for NT re-dispatch.
- Risks of reduced funding for OATT compliance activities, including (1) reduced ability to respond to new FERC initiatives; (2) generate new processes and tools; (3) develop regional consensus on OATT-related business practices.
- Reduced staffing levels to monitor and address process breakdowns associated with tariff compliance and compliance issues.
- Development of an agency strategy addressing transmission inventory.
- Development and implementation of FERC's Regional Planning requirements in alignment with BPA business practices and statutory requirements.
- Continue to address the market's evolving Transmission service needs with new products and services despite addressing limited capital, an aging infrastructure, and evolving technologies .
- FY 2018-19 rate case that balances adequate Transmission rates with regional economic needs.
- Ability to balance the need for near term initiatives such as the CAISO framework initiative, EIM access, South of Allston, and foundational improvements with development and implementation of a long-term strategy.

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4.6 Maintenance

FY 2018-19 Average: Proposed IPR Costs



Program Details

(\$Thousands)	Actuals	Rate Case		Proposed IPR		
	2015	2016	2017	2017	2018	2019
Non-Electric Maintenance	32,203	30,750	31,424	30,356	32,058	31,180
Substation Maintenance	36,926	28,566	29,043	35,353	36,000	36,658
Transmission Line Maintenance	27,733	27,054	27,482	29,319	29,817	30,228
System Protection Controls	12,718	13,541	13,741	15,283	15,640	15,999
Power System Maintenance	18,939	18,239	18,507	20,020	20,437	20,859
Joint Cost Maintenance	175	111	113	148	148	149
System Maintenance Management	6,041	9,954	9,556	8,000	8,138	8,285
Row Maintenance	6,502	10,098	10,162	9,901	9,944	9,986
Heavy Mobile Equipment Maintenance	116	0	0	18	18	18
Technical Training	2,317	2,368	2,418	2,423	2,471	2,526
Vegetation Management	18,223	17,181	17,039	17,282	17,354	17,441
Grand Total	161,894	157,861	159,485	168,103	172,025	173,329

Description, Purpose and Responsibilities

The BPA Maintenance program is responsible for maintaining about three-fourths of the Northwest Region's high-voltage transmission assets and providing safe, reliable, and cost-effective service to customers. The system is an interconnected network of more than 15,100 circuit miles of transmission lines connecting 261 substations, 732 communication sites and 3,100 miles of fiber optic cable, 43,500 steel towers, 73,500 wood poles, 195,600 acres of right-of-way corridors and 11,860 miles of access roads. Maintenance supports functions in the following sub-programs:



Non-Electric Facilities: Responsible for maintaining buildings, sites and systems that support the functionality of BPA's transmission system. BPA's Facilities Asset Management program is also a part of the Non-Electric Facilities sub-program. See the complete FAM strategy and the Workplace Services summary in the Agency Services section of this publication.

Substation Maintenance: Provides service and repair of more than 32,000 pieces of BPA-owned high voltage power system equipment, including power transformers, circuit breakers, switchgear, shunt and series capacitors and reactors, HVDC converter facility, instrument transformers, station AC and DC auxiliary power, and substation bus, insulators and structures.

Transmission Line Maintenance: Maintains and repairs BPA's network of overhead transmission lines and transmission line structures and fixtures including steel and aluminum lattice towers, wood poles and associated structures, insulators, insulator assemblies, overhead conductors and devices, fiber optic cable assemblies, obstruction warning devices, and roads and trails.

System Protection and Control Maintenance: Provides critical support to the primary circuit elements of BPA's Transmission system by maintaining overall reliability, gathering and storing operational data and ensuring public safety. The SPC program is responsible for 28,000 pieces of equipment in more than 950 locations, including BPA and customer-owned substations, power houses, maintenance buildings and control centers.

Power System Control Maintenance: Responsible for the maintenance of crucial transmission system fiber/telecommunications assets, Remedial Action Scheme, Supervisory Control and Data Acquisition and telemetering equipment. PSC's responsibilities include more than 11,000 pieces of equipment at 732 sites.

System Maintenance Management: Supports maintenance and general upkeep of capital plant, property and equipment, and provides operational support including plant repairs and minor replacements from point of generation to the entrance to the distribution system.

Heavy Mobile Equipment Maintenance: BPA's Fleet Management group is responsible for the acquisition, maintenance, and overall asset management of BPA's Mobile Equipment Fleet, as well as the maintenance of over 150 emergency generators in unmanned sub-maintenance facilities.

Vegetation Management and Rights-of-Way Maintenance: Ensures that BPA can safely access, construct, operate and maintain its transmission facilities, and that BPA's ROWs are clear of trees, brush, and encroachments that could affect the safety, accessibility, and reliability of the transmission system. This sub-program ensures compliance with all applicable environmental and reliability standards, including the ESA, NEPA, and NERC FAC-003.

Technical Training: Provides training and continuing education for electricians, linemen, operator apprentices, and craftsmen. In addition, it provides operator and engineer training, as well as professional training for Transmission Services annual employees in certain technical areas.

Goals

The Transmission Maintenance programs continue to prioritize safety and occupational health and to empower employees and contractors to recognize and address safety issues. This focus reinforces and helps to advance the safety culture throughout BPA.

Non-Electric Facilities: The long-term vision of the Non-Electric Facilities sub-program is to optimize and fully leverage BPA's asset portfolio to provide reliable, sustainable non-electric assets that meet current and future agency needs and to ensure performance condition standards that comply with applicable regulations while minimizing the life cycle costs. Goals also include developing and implementing FAM capabilities and industry best practices. See the complete FAM strategy in the Agency Services section of this publication.

Substation Maintenance: Ensure acceptable performance and service life is sustainable for more than 32,000 high-voltage substation components to enhance the reliability and efficiency of BPA's transmission system and to prevent the loss of transmission availability due to failure or substandard performance of substation equipment. The Substation Maintenance organization works to meet the following goals:

- Develop and implement predictive analysis tools using information from relays, sensors, cameras, and inspections, as well as data from SCADA and other maintenance databases.
- Strategic placement of on-site spares for transformers and reactors to support emergency preparedness.
- Ensure the availability of resources necessary for maintaining and repairing substation equipment in compliance with applicable standards.

Transmission Line Maintenance: Continue to develop a long-term strategy for inventorying, evaluating and mitigating the risks associated with an aging transmission system. Goals for the TLM program include:

- Effectively manage resources to maintain the reliability of BPA's transmission network and meet sustainable replacement targets.
- Proactively replace overhead system components nearing end of service life.
- Meet planned and unplanned outage frequency and duration targets as measured via the System Automatic Interruption Frequency Index and the System Automatic Interruption Duration Index.
- Mature the Transmission Asset System which provides a single-source asset data and maintenance work generation system for BPA's transmission system.

System Protection and Control Maintenance: Improve the reliability of the transmission system by using risk-informed evaluation of strategic alternatives to reduce cost while preserving equipment integrity, maintaining reliability, gathering and storing operational data, and ensuring public safety. Goals of the SPC Maintenance program also include the following mission-critical functions:

- Rapid isolation of equipment during fault conditions to prevent equipment damage, enhance system stability, and protect personal safety.
- Maintenance of system control and monitoring equipment that allows BPA operations and control center personnel to operate and maintain the power system.
- Installation and testing of revenue and interchange metering to ensure accurate meter data for scheduling and billing.
- Collecting and disseminating fault and event data used by Maintenance personnel to locate, troubleshoot, and correct system failures.
- Maintenance of Remedial Action Scheme equipment.

Power System Control Maintenance: The PSC Maintenance sub-program is implementing a total economic cost analytical approach which will produce a replacement plan that reduces risk, and therefore potential cost, to BPA and its customers. Key elements include:

- Focus on replacing critical, at-risk equipment first, with less-critical, low-risk equipment allowed to run to failure.
- Accumulated backlog of replacement work is addressed through planning based on economic lifecycle.
- Coordination of replacement strategies with SPC program.
- Enhance the reliability, capacity and compliance of BPA's communications network through technology upgrades, integration and life-cycle capabilities.

Heavy Mobile Equipment Maintenance: This sub-program has the following goals:

- Right-sizing and optimizing the Heavy Mobile Equipment fleet to ensure that BPA has the right vehicles, in the right locations, in the right configurations.
- Improving the preventative maintenance program to reduce the need for emergency or corrective maintenance and performing life cycle analysis for all equipment.

System Maintenance Management: To accomplish BPA's compliance-driven and contractually obligated maintenance responsibilities as efficiently and cost-effectively as possible, ensuring the reliability of BPA's transmission system through effective management of maintenance resources.

Technical Training: The overall goal of the Technical Training sub-program is to train high voltage-qualified, field-experienced electricians and linemen, operators and other key workers to ensure worker safety and the continuity of BPA's maintenance activities.

Vegetation Management and Rights-of-Way Maintenance: Sub-program goals include ensuring regulatory compliance with FERC, NERC, and WECC guidelines for managing vegetation, to protect public safety, and to prevent unplanned transmission outages. Through the implementation of integrated vegetation management practices, ensures that vegetation growth does not impede access to towers and prevents the risk of arcing from energized lines due to tree encroachment. In the long-term, this sub-program aims to prevent outages from vegetation infringements on transmission line ROW by maintaining appropriate clearance between transmission lines and vegetation.

Changes from the 2014 IPR

Non-Electric Facilities: See the complete Facilities Asset Management strategy and the Workplace Services summary in the Agency Services section of this publication.

Maintenance Sub-programs (TLM, Subs, SPC, PSC): Personnel cost increases and a growing maintenance backlog have driven cost increases in these sub-programs. BPA also implemented new Occupational Safety and Health Administration requirements for arc flash protection and mandatory personal protective equipment requiring the outfitting of over 1,000 employees with PPE and extensive arc flash studies.

Substation Maintenance: Increased funding is required to accelerate the existing high voltage bushing upgrade program. BPA continues to experience failure of aging reactor and transformer bushings.

Risks of Operating at Levels below the Proposed Spending Levels

Maintenance Sub-programs (TLM, Subs, SPC, PSC): The risk of not funding the sub programs will require backlogging maintenance. Failure to complete maintenance on schedule increases the likelihood of equipment failure causing significant system reliability issues and unplanned transmission system outages.

System Maintenance Management: The primary risk associated with lower-than requested funding for this sub-program is failure to comply with NERC reliability standards CIP version 5, and PRC-005 and WECC FAC-501 requirements.

Vegetation Management and Rights-of-Way Maintenance: Risks associated with lower-than-requested funding for the ROW maintenance program include significant system reliability issues, unplanned transmission system outages, an increasing backlog of maintenance work and land management cases.

Challenges/Constraints

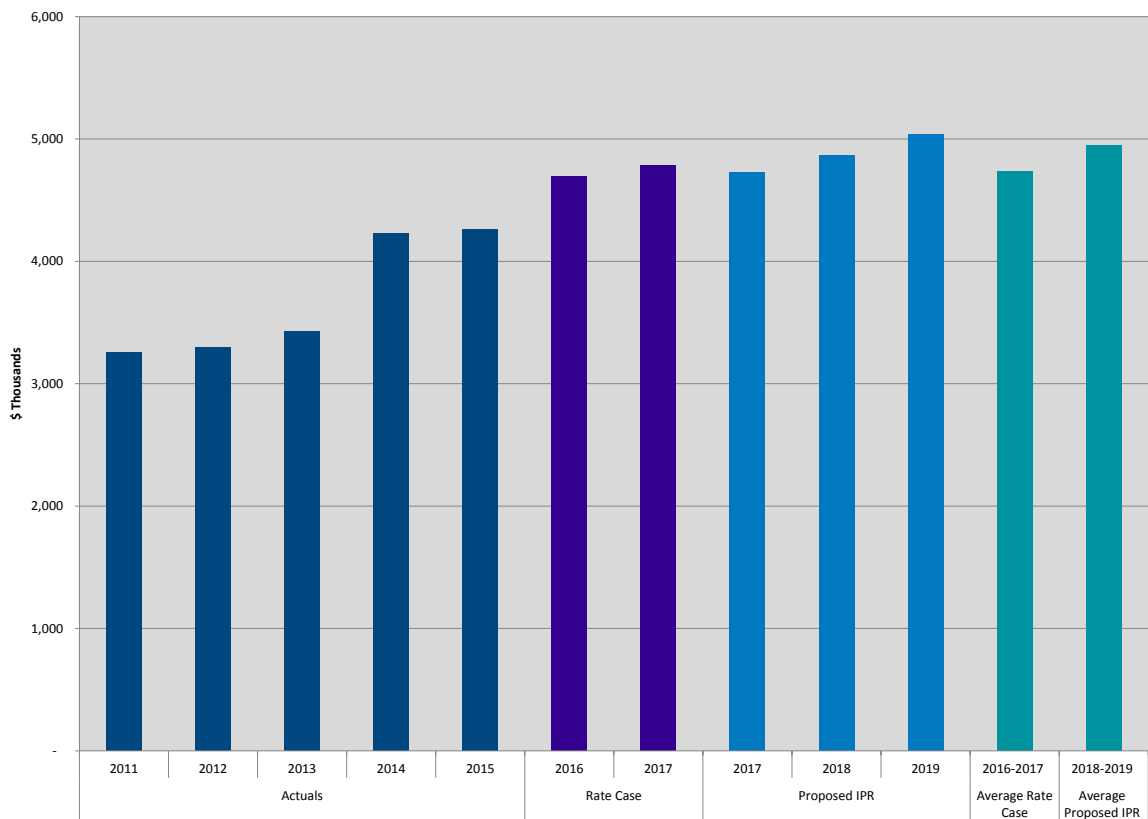
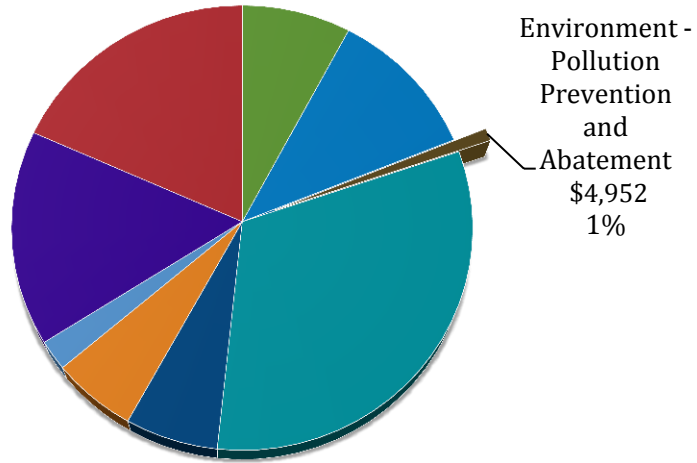
Non-Electric Facilities: The majority of the facilities portfolio (60 percent) is 30+ years old and in need of more intensive repair, maintenance, and/or replacement. Backlog of maintenance and repair (BMAR) has increased significantly over the past decade, driving facility reliability downward.

Transmission Line Maintenance: More than 60 percent of the steel line assets in BPA's transmission system have reached or are approaching the theoretical end of their useful life. Developing and implementing a sustainable replacement strategy that balances BPA's responsibility to maintain the reliability of this aging transmission system with pressures to keep Transmission rates as low as possible is the primary challenge facing this organization.

Power System Control Maintenance: Multiple generations of PSC equipment are installed on BPA's transmission system, and the increasing risk of PSC equipment failure is driving the development of a strategic approach. Rapid evolution of PSC technology means that some key elements of BPA's Power System Control network are now technologically obsolete; vendor support, spare parts, or both are often unavailable.

4.7 Environment – Pollution Prevention and Abatement

FY 2018–19 Average: Proposed IPR Costs



Program Details

(\$Thousands)	Actuals	Rate Case		Proposed IPR		
	2015	2016	2017	2017	2018	2019
Environmental Analysis	19	0	0	8	8	8
Pollution Prevention and Abatement	4,244	4,690	4,787	4,717	4,860	5,028
Grand Total	4,263	4,690	4,787	4,725	4,868	5,036

Description, Purpose and Responsibilities

The Pollution Prevention and Abatement organization is responsible for developing, coordinating and managing the implementation of environmental compliance requirements and programs for the operation, maintenance, and construction of BPA's transmission system. Specifically, PP&A develops, coordinates, and implements water protection, hazardous materials management, herbicide applicator licensing, erosion control, and other pollution prevention measures. It is also responsible for environmental permits, plans and specifications for transmission projects, along with overseeing implementation of environmental requirements during the construction of new transmission facilities, rebuilds or expansions.

Other key organizational responsibilities include management of BPA's polychlorinated biphenyls reduction program, as well as management of emergency environmental response, environmental investigations and environmental remediation projects.

Goals

Minimize BPA's environmental liabilities and ensure that Transmission activities, projects and facilities are in compliance with applicable environmental regulations. Examples of the methodologies employed include the following:

- Minimize BPA's environmental liability through Environmental Land Audits for proposed BPA land acquisitions.
- Provide environmental support and field oversight for transmission maintenance and construction projects.
- Provide guidance and direction on proper handling and disposal of regulated and hazardous materials generated by substation and facility construction projects.
- Conduct environmental reviews of access road maintenance projects, transmission pole replacement projects, vegetation management projects and other transmission O&M work.
- Provide on-site follow-up inspection and monitoring to ensure compliance with environmental requirements.
- Ensure timely environmental response and cleanup, including the 24/7 availability of emergency spill response coordination.
- Provide emergency response and cleanups, environmental guidance, environmental training, technical assistance, environmental permitting, mitigation monitoring, hazardous waste management, facility inspections, and implementation of environmental requirements.

Changes from the 2014 IPR

Staffing levels and associated costs were lower in 2015 than anticipated due to hiring issues that caused prolonged vacancies. It is anticipated that all currently vacant positions will be filled by the end of 2016, helping the organization to keep pace with the significantly increased transmission maintenance and construction workload.

Risks of Operating at Levels below the Proposed Spending Levels

Risks of operating at the spending levels below the proposed IPR program level include:

- Increased likelihood of legal and financial consequences due to non-compliance.
- Increased likelihood of natural resource and property damage caused by off-site release of insulating oil from spills at BPA substations.
- Increased risk of releases from transmission facilities damaging critical habitat previously improved with funds from BPA's Fish and Wildlife program.
- Costly delays and deferrals of transmission construction projects.

Challenges/Constraints

Human resource limitations, coupled with increases in agency requirements and increased transmission construction, may increase the likelihood of future environmental non-compliance and penalties.

The programs managed by this organization are non-discretionary and required by federal regulation for all Transmission operations, maintenance and construction actions. Therefore, these activities can only be scaled back by scaling back or eliminating BPA transmission construction actions.

This non-discretionary program is required by federal regulations. Trade-offs in terms of a decision to fund or not fund this program would essentially be a decision of whether or not to comply with the law. Alternatively, the tradeoff for choosing deferred program implementation would be higher long-term costs and potential penalties during the period of deferment.

The PP&A program is a non-discretionary environmental compliance requirement. Therefore, program costs are long-term fixed. Reductions in transmission construction projects is the only avenue for potential PP&A program reduction, while reductions in transmission maintenance would actually cause PP&A program costs to increase.

Environmental Capital investments are made strictly to bring transmission assets into environmental compliance or reduce environmental liabilities associated with those assets. When non-compliance or liabilities arise from failure of a transmission asset (i.e., a potential transformer fault) unplanned expense dollars must be found in the program to conduct environmental remediation, in addition to transmission's emergency capital replacement of the failed electrical equipment.

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4.8 Environment — Capital

Program Details

(\$Thousands)	Actuals	Rate Case		Proposed CIR			FY 17- 19 Total
	2015	2016	2017	2017	2018	2019	
Asset Category Direct Spending							
Environment	6,068	5,200	5,200	5,475	5,529	5,585	16,589
Grand Total	6,068	5,200	5,200	5,475	5,529	5,585	16,589

(\$Thousands)	Remaining CIR						
	2020	2021	2022	2023	2024	2025	2026
Asset Category Direct Spending							
Environment	5,641	5,697	5,754	5,811	5,614	5,614	5,614
Grand Total	5,641	5,697	5,754	5,811	5,614	5,614	5,614

Description, Purpose and Responsibilities

The Pollution Prevention and Abatement organization is responsible for developing, coordinating and managing the implementation of environmental compliance requirements and programs for the operation, maintenance and construction of BPA's transmission system. As such, the organization manages environmental capital programs, which are a part of the Transmission asset category.

Goals

Minimize BPA's environmental liabilities and ensure that Transmission activities, projects and facilities are in compliance with applicable environmental regulations. Specific Environmental Capital program objectives are:

- **PCB reduction** – Reduction of polychlorinated biphenyls, a primary persistent bioaccumulative toxic chemical on BPA's transmission system.
- **Water resources protection** – Ensure BPA's transmission facilities (i.e., substations and maintenance complexes) stormwater discharges meet all federal and state standards established under the Clean Water Act.
- **Oil storage compliance** – Ensure BPA's oil storage facilities meet all federal and state standards established under the Clean Water Act and hazardous materials regulations.

Near-Term Strategies:

- **PCB reduction** – Replace 40 or more pieces of high-voltage equipment annually that are regulated for PCB content under the Toxic Substances Control Act.
- **Water resources protection** – Install or upgrade drainage treatment and containment systems at environmentally sensitive transmission facilities to maintain water resources protection and to prevent regulatory non-compliance.

- **Oil storage compliance** – Install or upgrade oil storage at key transmission facility locations to meet environmental regulatory standards and requirements.

Long-Term Strategies:

- **PCB reduction** – Ensure the replacement of all high-voltage electrical equipment containing PCBs above 50 parts per million by the year 2025. This strategy will increase transmission system reliability, reduce BPA’s environmental liabilities and reduce long-term transmission and environmental expense spending level impacts.
- **Water resources protection** – Ensure all transmission facilities at environmentally sensitive locations meet stormwater treatment and spill containment regulatory requirements. This strategy will result in reduced BPA’s environmental liabilities and reduced exposure to environmental violations and associated penalties.
- **Oil storage compliance** – Support of the water resources protection strategy outlined above.

Changes from the 2014 CIR

The environmental capital program is managed with spending levels staying relatively stable and with a systematic approach that has not changed since the 2014 CIR. There are no new programs planned for FY 2017–2019.

Risks of Operating at Levels below the Proposed Spending Levels

Risks of operating at the spending levels below the proposed environmental capital program levels include:

- Lower transmission system reliability due to high-voltage electrical equipment 40 to 65 years old remaining in service that would have been replaced for PCB reduction.
- Financial and human resource impacts in the next rate case if BPA loses pace on the strategy of replacing all PCB regulated equipment by an anticipated 2025 ban.
- Increased likelihood of legal and financial consequences due to non-compliance.
- Increased likelihood of natural resource and property damage caused by off-site release of insulating oil from spills at BPA substations.
- Increased risk of releases from transmission facilities damaging critical habitat previously improved with funds from BPA’s Fish and Wildlife program.

Challenges

The success of the environmental capital programs is heavily dependent upon services from following BPA organizations:

- **Supply Chain** - Contracting, warehousing and waste disposal services.
- **Asset Program Support** - Project estimating and capital work order services.
- **Transmission Project Management** - Project management services and scheduling other transmission support services.
- **System Operations** - Transmission outage scheduling services.

- **Transmission Field Services** – Program implementation and construction services.
 - **Substation Maintenance and High Voltage Engineering** - Program coordination and implementation services.
 - **Facilities Asset Management** – Asset and facility maintenance services.
 - **Laboratory Services** – Environmental and equipment testing and waste characterization services.
- Environmental non-compliance and increased environmental liability and costs would result from the loss of any one of the above services or reduced funding of those organizations. No increase in these services for the environmental capital programs is anticipated for FY 2017–2019.

Non-Funded Items

Currently, there are no unfunded environmental capital program objectives.

Trade-offs

Operating below the current proposed funding level presents unacceptable environmental compliance and liability risks. This level of spend is modest and provides assurance that we are advancing our environmental confidence program at a good pace.

Firm vs Flexible

The environmental capital programs focus on environmental compliance and liability within a long-term strategy. Therefore, program costs are fixed long-term. The implementing organization has determined that these long-term capital asset investments reduce BPA's short and long-term expense costs.

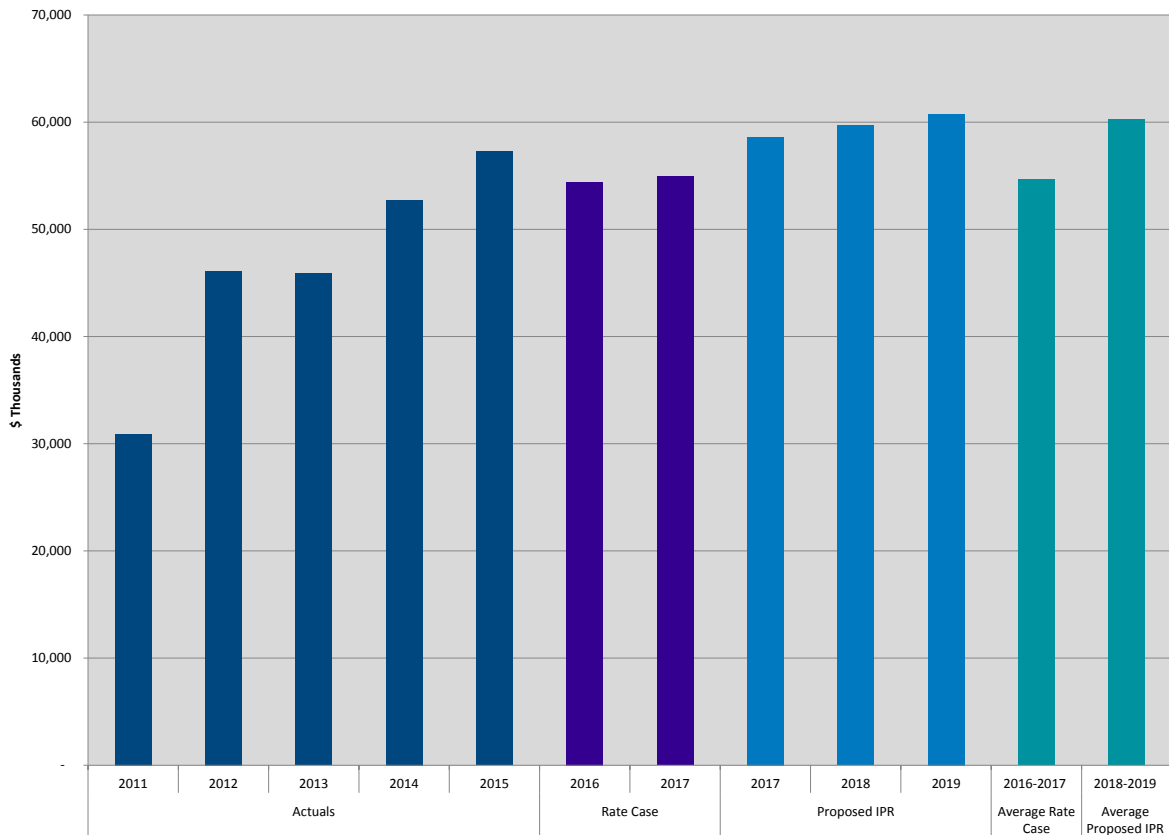
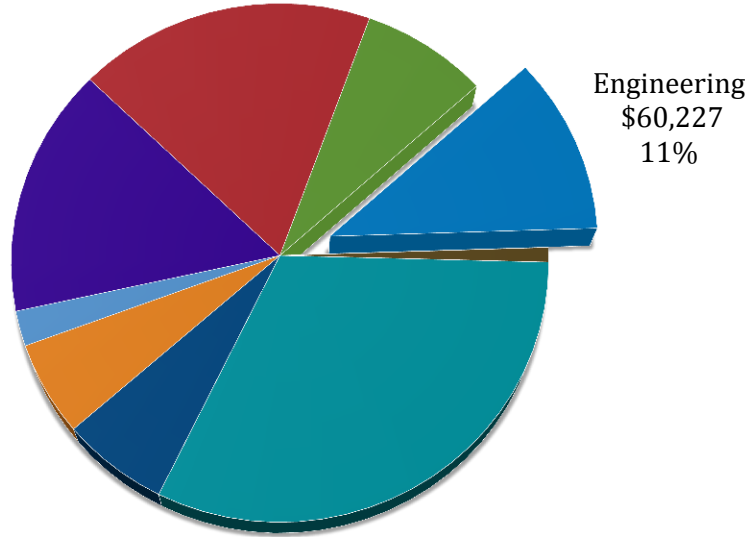
Integration of Capital and Expense

Environmental capital investments are made strictly to bring transmission assets into environmental compliance or reduce environmental liabilities associated with those assets. When non-compliance or liabilities arise from failure of a transmission asset (i.e., a potential transformer fault) unplanned expense dollars must be found in the Pollution Prevention and Abatement program to conduct environmental remediation, in addition to transmission's emergency capital replacement of the failed electrical equipment.

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4.9 Engineering

FY 2018-19 Average: Proposed IPR Costs



Program Details

(\$Thousands)	Actuals	Rate Case		Proposed IPR		
	2015	2016	2017	2017	2018	2019
Research and Development	7,359	9,522	9,555	7,762	8,170	8,585
Transmission System Development Planning and Analysis	22,796	16,486	16,738	21,690	21,983	22,282
Capital to Expense Transfers	6,836	4,307	4,351	4,285	4,285	4,285
NERC/WECC Compliance	17,168	20,311	20,422	21,024	21,355	21,667
Environmental Planning and Analysis	1,225	1,599	1,642	1,641	1,695	1,747
Engineering Line Rating	1,867	2,195	2,207	2,200	2,200	2,200
Grand Total	57,251	54,421	54,915	58,602	59,688	60,765

Description, Purpose and Responsibilities

Research and Development: BPA's Technology Innovation initiative has an annual cycle of portfolio funding based on strategic needs identified in BPA's technology roadmaps. For additional information regarding BPA's R&D program, please refer to the Corporate Strategy summary in the Agency Services section of this publication.

Transmission System Development Planning and Analysis: Provides technical support and asset planning for the capital infrastructure program.

Capital to Expense Transfer Program: As part of Capital Program development, the Asset Accounting organization analyzes projects to ensure qualification for capital funding consistent with capitalization policies and written guidance in the Plant Unit Catalog.

NERC/WECC Compliance: The bulk of funding for this sub-program supports staff resources for meeting NERC Orders 693 and 706 and addresses compliance with NERC and WECC mandatory standards, participation in the standards development process, implementing compliance standards, supporting annual NERC/WECC self-certification, and providing staff support for audits. This sub-program also includes costs for BPA's WECC and PEAK dues, payments to WECC for Unscheduled Flow management, and Transmission Forum membership. The costs of maintaining compliance standards are charged to other programs as part of day-to-day business processes.

Environmental Planning and Analysis: Ensures that all BPA activities undergo appropriate environmental analysis and compliance review in accordance with federal environmental and cultural resource laws.

Engineering Line Rating: Verifies transmission line ratings to support System Operating Limits, transmission line performance and public and worker safety.



Goals

TSD Planning & Analysis: Comply with NERC reliability standards by achieving the following goals:

- Accurately assess short and long-term transmission system needs to identify reinforcement projects to support BPA business, policy and compliance, and reliability objectives.
- Continued involvement with regional planning organizations, discussions and future integration.
- Develop Available Transfer Capability base cases to comply with NERC MOD standards. Address pending Transmission Service Requests by developing base cases to determine the existing ATC for long-term TSR. Conduct periodic Transmission Service Request Study and Expansion Process cluster studies.
- Continue improving the Transmission asset management program through the development of integrated strategies and supporting tools.
- Planning, designing, and construction support of the Capital program.

Capital to Expense Transfer Program: Conduct annual analysis of BPA's outstanding capital work orders to assess whether they should be expensed.

NERC/WECC Compliance: Goals of this sub-program include:

- Achieving and maintaining compliance through analysis of new and revised standards.
- Analyzing equipment, tool, system, and process needs to achieve and maintain compliance.
- Maintaining awareness of constantly-changing regulatory requirements and improving compliance-related analytical capabilities.

Environmental Planning and Analysis: To facilitate environmental and cultural resources protection and compliance through integration of environmental considerations in BPA decision-making, and through timely development and completion of all analysis and documentation required under federal environmental and cultural resource laws. Provide environmental strategies for BPA programs and policies, and training to help BPA staff remain current with the rapidly-changing federal environmental compliance landscape. Maintain current staffing and contracting support to keep pace with an increased environmental compliance workload. The number of major environmental analyses (Environmental Assessments and Environmental Impact Statements) the organization has underway has nearly tripled over the past five years, from about 15 in FY 2010 to 50 in FY 2015. Continued efforts to integrate environmental considerations as early as possible in BPA decision-making, developing programmatic streamlined permit tools as well as greater adaptation of information technology to make environmental processes more streamlined and more accessible to the public and customers; maintain high-quality, solution-focused staff with the skills and resources to accomplish complex analyses effectively and efficiently; and to continue to implement monitoring and adaptive management to improve the effectiveness of BPA environmental mitigation actions.

Engineering Line Rating: The ELR program validates BPA's Transmission Line Rating Catalog through the survey analysis, field observations and data analysis to support BPA's system operating

limits. Because field conditions change over time, the ELR program resurveys the transmission system to ensure that minimum ground clearance standards are met, protecting worker and public safety, system reliability, transmission line performance and assuring that line ratings are in compliance with the NERC Current Field Conditions Alert.

Changes from 2014 IPR

Transmission Services has aligned with the agency Asset Management Key Strategic Initiative and is focused on achieving key business outcomes by the end of 2018 in several areas, including:

- One BPA Outage Planning and Management.
- SOLs on Demand and other dynamic tools, providing situational awareness to monitor capacity and reliability.
- Asset Management and Program Delivery initiative to achieve significantly improved annual program delivery levels, substantially advanced asset management data quality and systems, and robust project integration.

Remedial Action Schemes: Transmission Services continues to implement RAS automatic arming to realize the following business objectives:

- Optimization of algorithms, eliminating large RAS arming steps, using automatic arming of West Side RAS algorithms.
- Reduction of the generation armed for West Side RAS contingencies by realizing the most effective generation first.

Personnel related costs are expected to increase due to a new special salary rate for engineers and negotiated increases for the hourly workforce.

TSD Planning and Analysis: This program has been increased to reflect transferring Columbia Grid coordination from Corporate to Transmission.

NERC/WECC Compliance: Transmission completed a major step in the continued improvement of our Mandatory Reliability standards posture through the establishment of the Reliability Standard Implementation Planning Process and Reliability Standard Owners. These efforts create a focus around standards interpretations, define clear roles and responsibilities, include risk assessments and implementation plans and provide for continued day-to-day operational compliance.

Environmental Planning and Analysis: EC transmission capital and expenses as well as Power and F&W expense costs are reflected as BFTE salary, supplemental labor costs and service contracts and are an increase from the 2014 IPR levels. This increase is a function of previously approved FTE increases in order to keep pace with the significantly increased workload.

Engineering Line Rating: The analytical phase of this work continues, including the design and construction of any required system upgrades or modifications also continues.

Risks of Operating at Levels below the Proposed Spending Levels

TSD Planning and Analysis: Decreased funding would impact BPA's ability to identify and develop plans of service for needed transmission reinforcements, which could lead to WECC, NERC, and FERC compliance issues. The inability to determine risks and opportunities during the planning phase could result in under- or over-investment in portions of BPA's transmission system. Under-investment would aggravate existing congestion issues, increasing the potential for curtailments, while over-investment would unnecessarily increase transmission rates.

NERC/WECC Compliance: Both reputational and financial risks exist in this program if we are unable to remain in compliance with standards. The regulators continue to mature their focus on standards evolving to focus on higher risk and impact standards. The complexity and level of support required to remain compliant remains high. While BPA cannot be sanctioned for non-compliance, the regulators can direct BPA to respond on an accelerated schedule, potentially requiring significant funding.

Environmental Planning and Analysis: The primary impact of operating at or below the baseline cost target is delay in the implementation of BPA Transmission, Power (including Fish and Wildlife) projects due to insufficient staff to review and screen projects for environmental and cultural resource compliance. Such delays will lead to increased implementation costs due to missed schedules and outages, the need for additional resources to finish construction on time, and/or the cost of additional or unanticipated mitigation. For some projects, mitigation would not have been required had there been sufficient advance review to avoid sensitive sites within proposed project areas.

Other potential risks include an increased likelihood of compliance violations, with associated risk of damage to sensitive environmental and cultural resources, significant financial penalties, potentially-significant project delays while mitigation is implemented, and loss of reputation with regional stakeholders. Failure to comply with federal environmental laws and regulations such as the ESA or CWA also exposes BPA to serious legal/litigation risks.

Engineering Line Rating: Reduced funding for this sub-program could detrimentally impact BPA's ability to complete LiDAR survey work increasing the likelihood that BPA will be out of compliance with the NERC alert. Other potential risks include the risk to the reliability of transmission lines, BPA's Transmission Line SOLs and to worker and public safety from failure to identify facilities that are out of compliance with current ground clearance standards, as well as lost opportunity to increase system capacity by identifying lines and facilities whose ground clearance exceeds the data in BPA's line rating catalog.

Challenges/Constraints

Transmission System Development — Planning and Analysis:

- Development of Dynamic Transfer Capability and Energy Imbalance Markets.
- Compliance with new and changing regulatory requirements including FERC orders and NERC reliability standards.
- Increasing responsibility for regional coordination with other Transmission planning entities and planning coordinators including cost allocation under FERC Order 1000.
- Changing usage of capacity on the BPA transmission system creates challenges for modeling, studies and identifying reinforcements to optimize flexibility.

Capital to Expense Transfer Program: Challenges and constraints affecting this program include emergency repair of damage to minor equipment units, aging transmission equipment, and the fact that preliminary engineering capital work orders are issued to collect costs associated with specific preliminary planning, system study, and design activities. If a project is canceled, these charges will be expensed to this program.

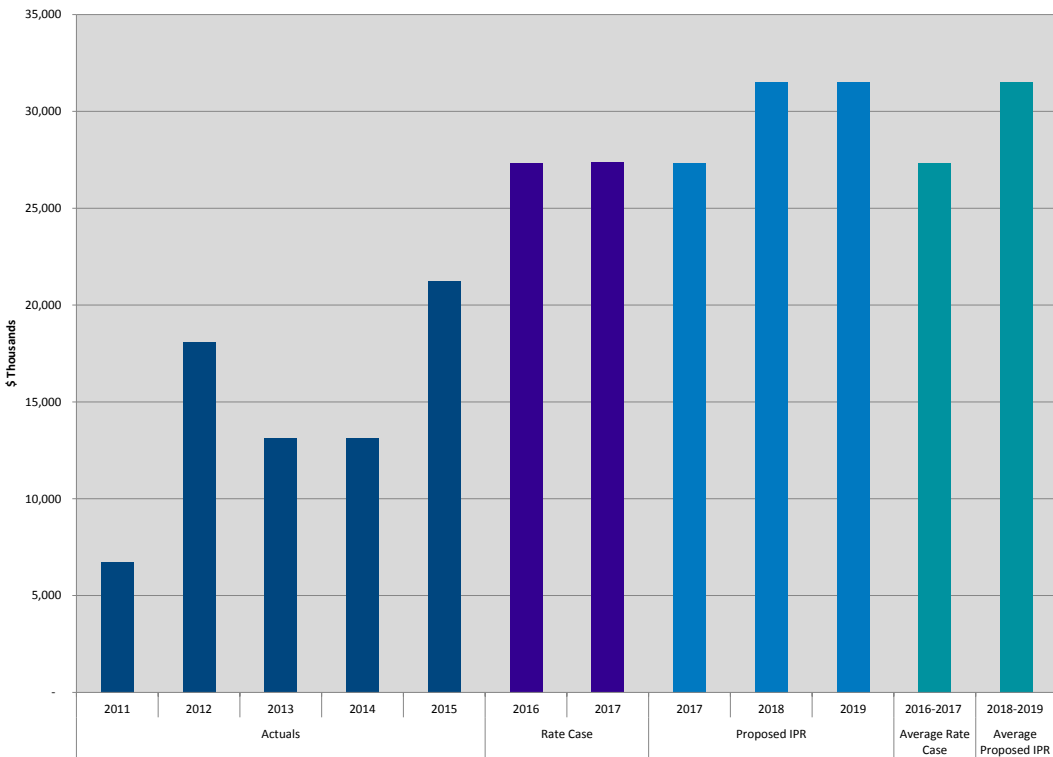
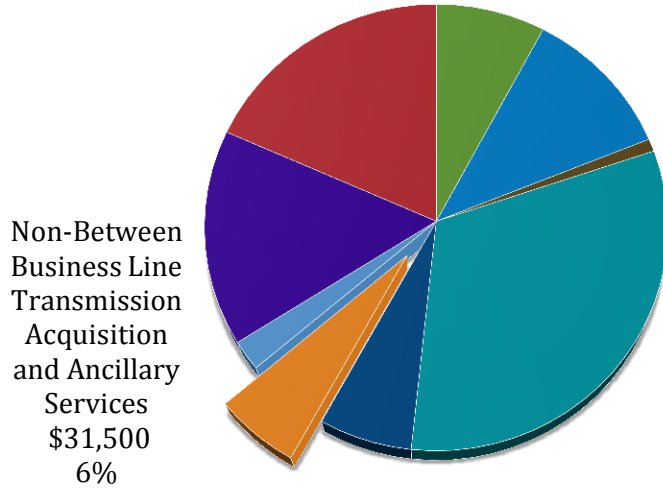
NERC/WECC Compliance: Continued focus in this program will remain as a result of the introduction of new standards and the evolution of existing standards. Transmission Services will continue to look for opportunities to leverage technology to manage and access data in support of compliance reporting.

Environmental Planning and Analysis: EC's major compliance workload (the production of environmental impact statements and environmental assessments) has quintupled since the end of FY 2010 and out year planning shows no signs of slowdowns. EC needs to be able to maintain BPA's basic environmental compliance responsibilities, and take on new or broader initiatives (such as additional programmatic environmental analyses to address large-scale BPA program areas, some of which are court ordered such as the FCRPS BiOp remand or other strategic or innovative measures).

Engineering Line Rating: Access to the necessary computer hardware and software – the data collection and analysis associated with the ELR program — requires significant IT and engineering resources. There may also be worker and public safety issues that need to be resolved. In cases where there are safety issues, such as a lack of ground clearance, transmission line modification may be needed and there may be impacts to BPA's Transmission Line SOLs.

4.10 Non-Between Business Line (Non-BBL) Transmission Acquisition and Ancillary Services

FY 2018-19 Average: Proposed IPR Costs



Program Details

(\$Thousands)	Actuals	Rate Case		Proposed IPR		
	2015	2016	2017	2017	2018	2019
Leased Facilities	5,478	7,447	7,447	7,447	7,447	7,447
Settlement Agreements	9,716	18	18	0	0	0
Non-Between Business Line Ancillary Services	2,323	18,560	18,560	18,865	18,865	18,865
Oversupply Displacement Costs	2,702	0	0	0	0	0
Reliability Demand Response/Redispatch	1,033	1,313	1,328	1,019	5,188	5,188
Grand Total	21,253	27,338	27,353	27,331	31,500	31,500

Description, Purpose and Responsibilities

Leased Facilities: The Leased Facilities sub-function negotiates and administers agreements covering the lease of customer-owned transmission lines, substations, and equipment (including related expenses) needed to provide reliable service on BPA's transmission network.

Settlement Agreements: This sub-program is responsible for the administration of transmission-related settlement agreements reached through BPA's dispute resolution process. Settlements are required due to equipment disruptions, transactional errors and contractual disputes. Key products and outputs include settlements paid to customers.

Non-Between Business Lines Ancillary Services: BPA provides ancillary services to support the transmission of energy from resources to loads to maintain transmission system reliability. Non-BBL ancillary services are provided by a customer other than BPA Power Services: contingency energy deliveries, non-federal redispatch, stability reserves, non-federal Variable Energy Resource Balancing Service reserve acquisitions, and settlement actions for Avista parallel capacity support.

Reliability Demand Response/Redispatch: This sub-program includes BPA initiatives designed to optimize use of the transmission system and necessary support services through improved wind forecasting and more flexible scheduling capabilities, and the integration of additional resources to provide additional balancing reserve services to support BPA's Ancillary and Control Services Balancing Reserve acquisition policies, as well as third-party reserve and self-supply initiatives.

Goals

Leased Facilities: Create lease agreements and other costs of transmission, when such arrangements are feasible, cost effective, and least-cost to deliver power. Proactively manage lease arrangements to develop long-term strategies. This sub-program provides customer service, oversight and internal audit services to ensure the continued operational soundness and cost effectiveness of these agreements.

Settlement Agreements: The goal of the Settlement Agreements sub-program is to make timely payments to customers in the event a settlement is reached. Its near-term strategy is to minimize BPA's exposure to settlements.

Non-BBL Ancillary Services: The goal of the Ancillary Services sub-program is to efficiently provide the voltage support, scheduling, dispatch and other services necessary to maintain the reliability of BPA's transmission grid. Ancillary Services' near-term strategies are focused on the efficient management of the resources needed to support the reliability of BPA's transmission grid. They include:

- The cost-effective acquisition of VERBS capacity and energy from non-federal providers in accordance with the 2016-2017 Rate Case Settlement terms.
- Ensuring that key Transmission reliability support services, including contingency energy delivery, stability reserves, and non-federal redispatch, are available when needed by BPA.

Reliability Demand Response/Redispatch: This program includes BPA initiatives designed to optimize use of the transmission system and support services through improved wind forecasting, more flexible scheduling capabilities, and integration of additional balancing reserve services, as well as third-party reserve and self-supply initiatives. BPA will continue to implement these initiatives, including improvements that allow market participants to make shorter-term purchases of balancing capacity to meet their variable energy resource needs. This sub-program is also leading BPA's participation in the Operational Controls for Balancing Reserves reserve management, Customer-Supplied Generation Imbalance reserve self-supply, intra-hour scheduling, Enhanced Supplemental Service Systems Development processes and a commercial solution to non-build.

Changes from the 2014 IPR

Non-BBL Ancillary Services: This sub-program had the following changes from the 2014 IPR:

- Responsible for the acquisition of variable energy resource balancing service (VERBS) capacity and energy acquisition needs in accordance with the FY 2016–17 Rate Case Settlement terms. These include resources in excess of the agreed upon FCRPS VERBS capacity provided by BPA Power Services.

Reliability Demand Response/Redispatch: This sub-program had the following changes from the 2014 IPR:

- Balancing Reserve Acquisition Decisions and Visibility: During the spring months, implement systems to facilitate acquisition of third-party-supplied balancing reserves.

Risks of Operating at Levels below the Proposed Spending Levels

To achieve operating at the proposed spending levels, BPA's Transmission Acquisition and Non-BBL Ancillary Services Program has committed to manage within our allocated budgets and absorb the costs of implementing the commercial non-wires solution. The majority of BPA's Transmission Acquisition and Non BBL Ancillary Services proposed spending levels is to cover service contracts and personnel compensation and benefit costs. Lower-than-requested funding for the Transmission

Acquisition and Non-BBL Ancillary Services Program will create challenges in the implementation of reliability standards and other changes in commercial activities including the following:

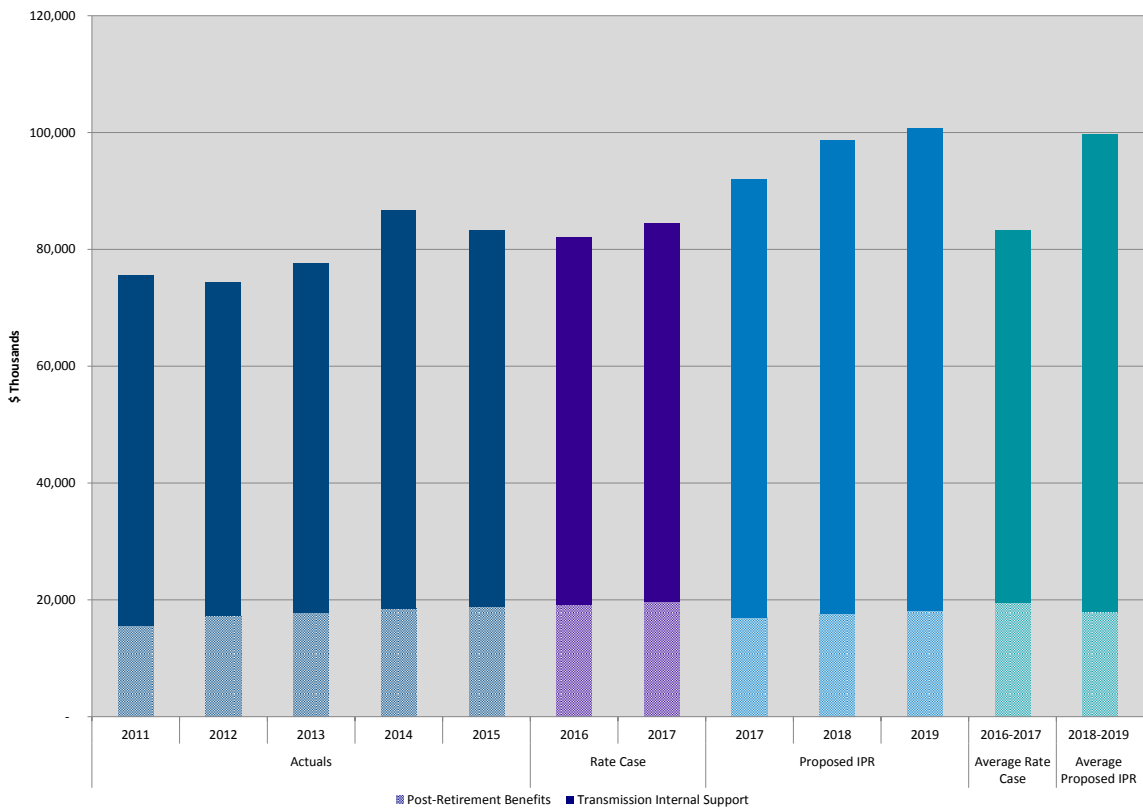
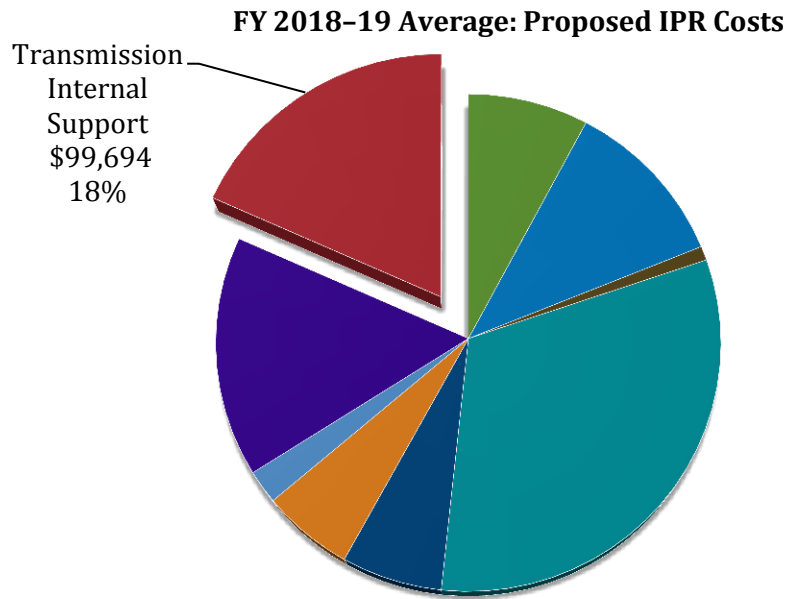
Leased Facilities: Leased facilities payments are contractually obligated; most are long-term commitments. The risk of underfunding this program is inability to meet BPA financial obligations and would require BPA to consider a “build” option.

Ancillary Services: The Ancillary Services provided by this organization are integral to the reliable operation of BPA's transmission grid, and are non-discretionary. Reduced funding for Ancillary Services could detrimentally impact the reliability of the transmission grid and BPA's ability to meet its customers' transmission needs.

- Higher than expected demand for VERBS could erode BPAT financial reserves more quickly than anticipated, resulting in increased financial risk to BPA.
- Monitoring and anticipating the balancing needs of a rapidly-changing variable energy generation landscape.
- The need to anticipate and respond effectively to volatility in price and availability of balancing capacity in the future.
- Risks of violating the Open Access Transmission Tariff.

Reliability Demand Response/Redispatch: The Reliability Demand Response/Redispatch resource development intensifies regional demand for balancing reserves. The FCRPS is approaching the limit of its balancing reserve supply capability. Curtailment of funding or FTE support for the renewable energy team will limit BPA's ability to develop alternatives for the increasing demand for balancing services. Reducing the level of service BPA provides to renewable parties could hamper renewable generation development and non-wire solutions in BPA's Balancing Authority Area, with potentially detrimental political and environmental consequences for BPA and the region.

4.11 Transmission Internal Support



Program Details

(\$Thousands)	Actuals	Rate Case		Proposed IPR		
	2015	2016	2017	2017	2018	2019
Additional Post-Retirement Benefits	18,819	19,143	19,748	17,023	17,591	18,209
Transmission Internal Support	64,371	62,895	64,775	75,031	81,011	82,576
Grand Total	83,190	82,038	84,523	92,053	98,602	100,786

*Unfunded Post-Retirement Benefits will see a \$2.7M expense decrease in FY 2017 and a \$2.3M average expense decrease for FY 2018-19.

Description, Purpose and Responsibilities

Internal support consists of two separate programs, Additional Post Retirement Benefits Contributions and Agency Services General and Administrative. The Internal Support program is included in both the Power and Transmission revenue requirements. Since the program is the same for each business unit, the full narrative is captured in the [Power Internal Support section](#).

Changes from 2014 IPR

As part of Transmission Services' continuing efforts to keep costs as low as possible, a more detailed methodology was applied to the calculation of Post Retirement Benefits resulting in a significant reduction in proposed Internal Support expenses.

5. AGENCY SERVICES

OVERVIEW

- Even with the additional funding in support of Key Strategic Initiatives, Agency Services held close to BP-16 spending levels, in part by reducing other program costs.
- The majority of cost increases are in labor, leading to difficult staffing level decisions balanced against a need to provide efficient services.

The information contained in this section of the report is supplemental to the Power and Transmission Sections. All Agency Services costs are included in the Power and Transmission program tables to provide a complete business line view. The narrative information provided in this section is in greater detail than found in the Power and Transmission sections.

Agency Services is the term used to refer to all of the corporate organizations. For this IPR, Agency Services will be addressed in two sections – functions within the Chief Administrative Office (CAO) and functions provided by the rest of Corporate. CAO and Corporate organization costs are ultimately covered by Power and Transmission rates. CAO and Corporate organizations can directly charge into Power and Transmission operations and maintenance programs, if there is a direct benefit to the program. However, other costs are shared costs and are allocated to Power and Transmission Services via the Agency Services G&A and Business Support cost pools.

Agency Services organizations had their eye on efficient operations as they prepared their spending proposals for this IPR. Each organization has detailed the trade-offs made to keep their costs as low as possible without severely impacting their ability to provide the necessary services for the Power and Transmission programs.

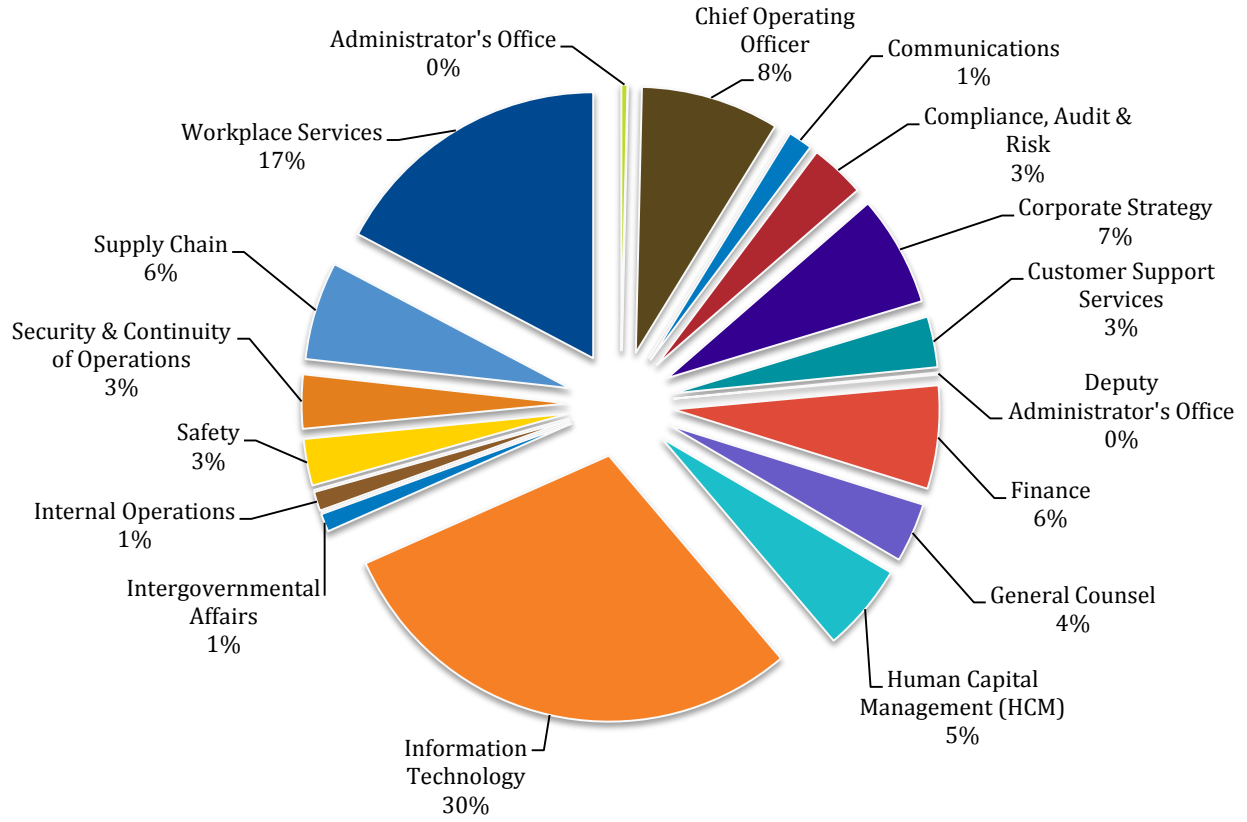
Agency Services long-term goals are to provide:

- Quality service.
- Continuous improvement and operational efficiencies.
- Rigorous compliance with applicable laws and regulations.

In the Agency Services functions, BPA first determined whether the service is still required and, if so, how to provide the service at the lowest cost consistent with sound business principles.

BPA takes adherence to laws and regulations as important business practices. BPA does not expect to expose itself to repercussions by establishing cost levels so low as to risk BPA's reputation and creditability.

FY 2018-19 Average: Proposed IPR Costs



(\$Thousands)	Actuals	Rate Case		Proposed IPR		
	2015	2016	2017	2017	2018	2019
Administrator's Office Total	809	791	809	1,154	1,200	1,240
Human Capital Management (HCM)	18,768	20,867	21,343	17,210	17,550	17,898
Internal Operations	1,026	774	793	3,748	3,822	3,896
Safety	3,971	3,628	3,697	9,115	9,291	9,473
Security & Continuity of Operations (OSCO)	9,953	10,525	10,711	10,531	10,732	10,940
Supply Chain	20,641	21,284	21,685	19,151	19,550	19,950
Workplace Services	55,985	56,955	58,101	54,660	56,429	57,831
Chief Administrative Office Total	110,344	114,033	116,330	114,415	117,373	119,988
Chief Operating Officer	959	870	885	12,711	27,792	27,843
Customer Support Services	9,707	11,560	11,845	9,707	10,048	10,405
Chief Operating Officer Total	10,666	12,431	12,730	22,418	37,840	38,248
Compliance, Audit & Risk Total	10,230	10,843	11,170	10,467	10,773	11,350
Corporate Strategy Total	21,820	36,945	38,275	20,983	21,830	22,691
Communications	4,237	8,070	8,265	4,657	4,796	4,949
Deputy Administrator's Office	433	347	354	385	404	418
Intergovernmental Affairs	2,763	0	0	3,494	3,594	3,693
Deputy Administrator's Total	7,432	8,417	8,618	8,536	8,794	9,059
Finance Total	16,285	18,739	19,292	19,390	20,373	21,106
General Counsel Total	11,357	12,760	13,210	11,357	11,751	12,142
Information Technology Total	85,047	85,961	86,831	95,012	97,136	98,446
Undistributed Reduction		(13,800)	(12,200)			
Grand Total	273,990	287,120	295,066	303,732	327,070	334,269

- The amounts in this chart are included in the Power and Transmission program totals and are not additive when coming to the total agency spending proposal.
- The increase over BP-16 is made up of the KSI costs (\$25M for Comm Ops, \$3+M for all others) and IT (about \$11M).

5.1 Corporate Overview

The proposed spending levels for the Corporate organizations for FY 2017–2019 support cost-effective services to internal clients, including Power Services and Transmission Services.

Corporate organizations fall under the direction of the Deputy Administrator or the Chief Operating Officer. They are:

- Deputy Administrator
- Compliance, Audit & Risk Management
- Intergovernmental Affairs
- Communications
- Finance Office
- General Counsel
- Corporate Strategy
- Chief Operating Officer
- Information Technology
- Environment, Fish and Wildlife
- Customer Support Services

The tables for each of the organizations include all costs that are allocated to Power Services and Transmission Services and a subset of costs that are direct charged to the business units. All costs are included in the program view tables found in the Power Services and Transmission Services sections in this report.

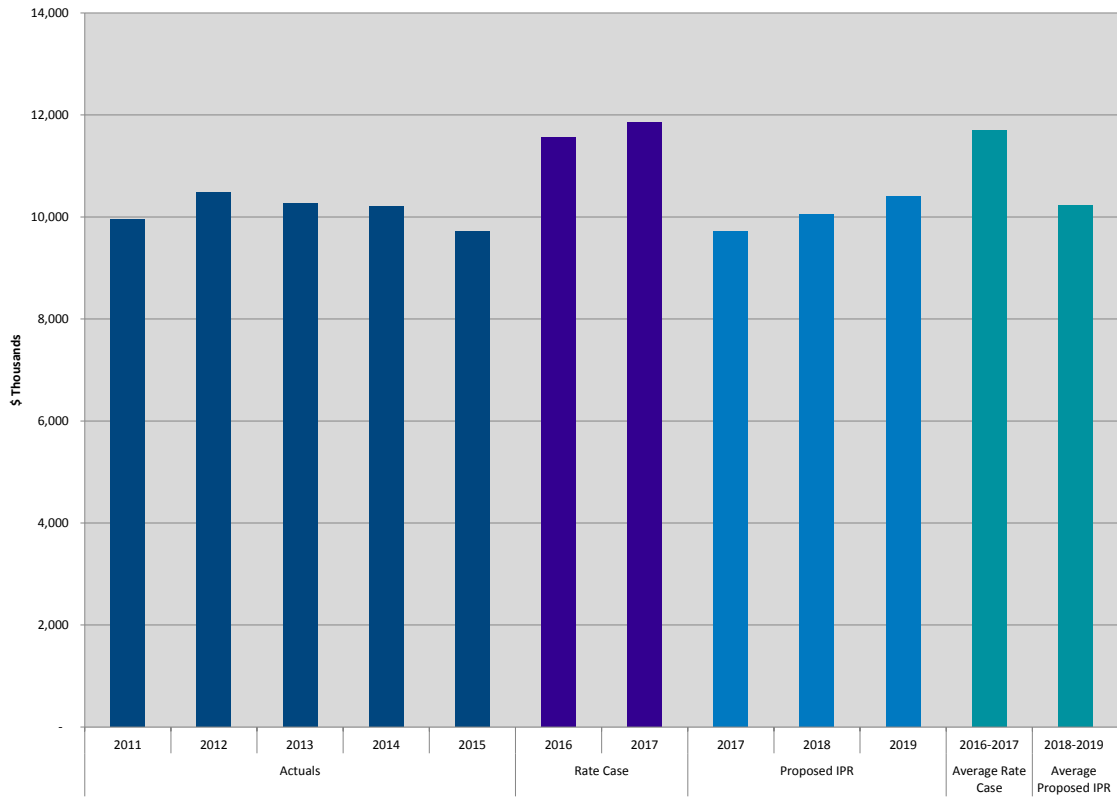
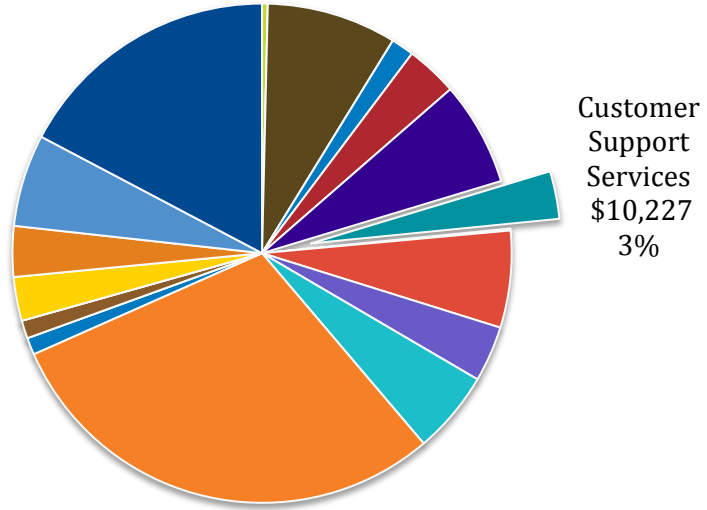
In aggregate, excluding Environment, Fish & Wildlife, the Corporate groups FY 2018–19 proposed spending for base workload is close to the BP-16 spending levels. In addition, many of the KSIs are being led, and budgeted for, by the Corporate organizations. These include, Asset Management (Finance), Business Information Systems (Finance), Long-Term Finance and Rates (Finance), Commercial Operations (COO shared lead with Power and Transmission).

In the following sections, each of the Corporate organizations provides more information about their products and services, the goals for their organizations, trade-offs made in preparing these spending levels, firm vs. flexible costs and integration of capital vs. expense, where applicable.

(\$Thousands)	Actuals	Rate Case		Proposed IPR		
	2015	2016	2017	2017	2018	2019
Administrator's Office Total	809	791	809	1,154	1,200	1,240
Chief Operating Officer	959	870	885	12,711	27,792	27,843
Customer Support Services	9,707	11,560	11,845	9,707	10,048	10,405
Chief Operating Officer Total	10,666	12,431	12,730	22,418	37,840	38,248
Compliance, Audit & Risk Total	10,230	10,843	11,170	10,467	10,773	11,350
Corporate Strategy Total	21,820	36,945	38,275	20,983	21,830	22,691
Communications	4,237	8,070	8,265	4,657	4,796	4,949
Deputy Administrator's Office	433	347	354	385	404	418
Intergovernmental Affairs	2,763	0	0	3,494	3,594	3,693
Deputy Administrator's Total	7,432	8,417	8,618	8,536	8,794	9,059
Finance Total	16,285	18,739	19,292	19,390	20,373	21,106
General Counsel Total	11,357	12,760	13,210	11,357	11,751	12,142
Information Technology Total	85,047	85,961	86,831	95,012	97,136	98,446
Undistributed Reduction		(13,800)	(12,200)			
Grand Total	163,646	173,087	178,736	189,317	209,697	214,281

5.1.1 Customer Support Services

FY 2018-19 Average: Proposed IPR Costs



Program Details

(\$Thousands)	Actuals	Rate Case		Proposed IPR		
	2015	2016	2017	2017	2018	2019
Agency Services G&A Allocations	9,654	11,560	11,845	9,707	10,048	10,405
Power Direct Support	53	0	0	0	0	0
Grand Total	9,707	11,560	11,845	9,707	10,048	10,405

Description, Purpose and Responsibilities

Customer Support Services (CSS) provides all agency load forecasts, customer bills, and oversees revenue metering services and contract administration. CSS' quality information technology systems are critical to its work with responsibilities for overall business management and operation, data stewardship and integration with other business operations and customer service IT systems. CSS provides core business services and leadership central to the customer experience while meeting marketing and sales back office governance requirements. It interfaces and works closely with the front office business organizations of Power and Transmission.

Goals

- Implement agency mission objectives through a holistic execution of back office functions.
- Ensure CSS IT systems keep pace with the changing needs of the utility industry.
- Institutionalize the quality bill initiative within CSS to foster continuous improvement, ensure data and information are accurate and up-to-date, and minimize manual and duplicate data inputs.
- Train and develop staff to consistently deliver high quality results as well as broaden and deepen staff understanding of BPA's business relationships.
- Raise awareness in agency strategic initiatives and business and market trends such that CSS can assess impacts and respond in a timely manner to the changing energy landscape.

Changes from the 2014 IPR

After getting the REV systems implemented, customer support services has focused on extracting value out of the support systems and continuously improving processes and systems. The quality bill initiative (QBI) was designed and implemented with the goal of billing the customer in a timely manner on the right product and quantity, using correct rates, resulting in the correct dollar amount the first time. This includes creating a system where processes can be identified, tracked and improved across the CSS organization, and issues can be systematically resolved to increase quality, reduce re-work, or otherwise improve the value and service delivery from CSS to BPA's customers. The QBI aims to help CSS build on its current strengths, identify and address any opportunities for improvement, and expand on its operational excellence initiatives.

As usual, resolving systems issues is an ongoing challenge for CSS. The next rate period will be no different. The following are some known issues CSS is already planning for:

- Oracle has announced the planned release of a new billing application which will replace Oracle's Loadstar application currently used by BPA's Customer Billing workgroup. Support for the current Loadstar application will continue until March of 2022, with premier support until March 2019 and extended support until March 2022. CSS will be working with IT to conduct an alternatives analysis regarding options for a future billing system.
- CSS is also working with IT to explore the options for Customer Portal (CP). The current CP uses a SharePoint platform which is not structurally able to perform all CP needs without multiple customizations. Customers have come to expect the ability to electronically sign-in to gain access to their documents and conduct business. The current platform has been unstable and is not able to grow to meet BPA operational needs and customer requests for additional functionality.
- In 2014, Energy Efficiency transferred the Energy 2020 conservation modeling tool to Load Forecasting. Energy 2020 is the same modeling tool the Northwest Power & Conservation Council uses. Since that time, Load Forecasting has been working to make it a functional tool for forecasting. Load Forecasting has struggled to make it functional with the current IT infrastructure, licensing, vendor contracting and resources.
- CSS continues to work with IT to ensure the functionality of the eight CSS systems to keep pace with the changing needs of the utility industry and BPA business needs. Those systems include: Customer Portal, Customer Contract Management, Customer Data Management, Customer Billing Center, Billing Invoice Lookup System, Agency Metering System, Service Point Profile and Agency Load Forecasting.

Risks of Operating at Levels below the Proposed Spending Levels

Personnel costs are the primary component of the CSS proposed spending levels. In order to maintain the IPR proposal to limit FY 2017 CSS spending to FY 2015 actual spending, staffing levels will be reduced via attrition. Remaining staff will need to assume the workload for those positions that are vacated. This will limit CSS' ability to support new projects and initiatives such as the Business Information Systems and Commercial Operations KSIs. Work on the QBI may have unforeseen impacts due to limited staff resources, and may stop work on internal process improvements.

Due to limited staff, there is a risk to the level of support provided by Customer Billing for the billing system replacement project, and the required IT system work to implement billing system changes for the BP-18 rate case.

Contract Management and Administration's timely input of data into the cross-Agency CCM, CDM, and CP systems may slow with limited staff. This effects downstream systems that rely on this timely data input. Reduced staff also may increase response time for external and internal customer questions or issues related to the CCM, CDM, and CP support desks. Impacts may also affect coverage for key agreements due to retirements of senior staff. In addition, necessary system

upgrades to CCM and CDM, and work on the CP replacement project will be delayed with limited resources.

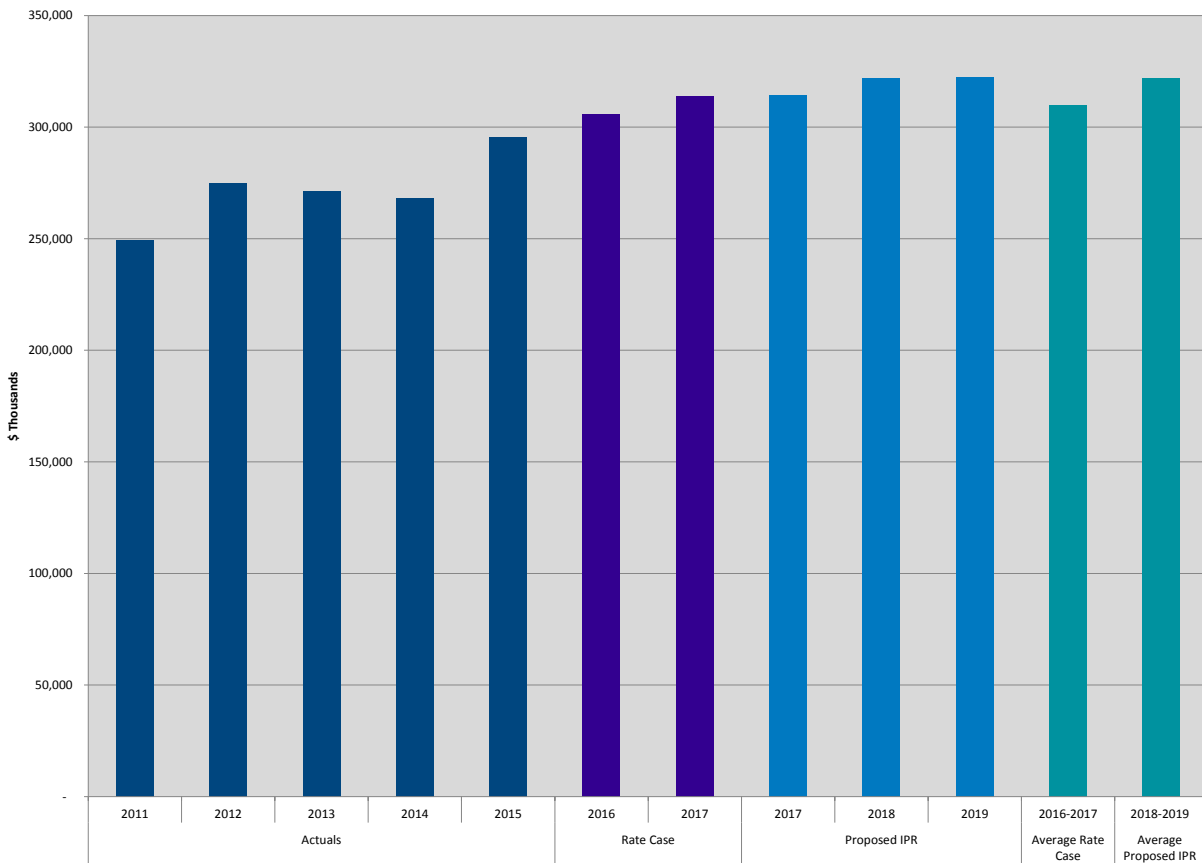
Load Forecasting may have limited resources to support the Energy 2020 modeling tool. The Council encouraged BPA to finalize implementation in the 7th Power plan as this type of forecasting is critical to effectively forecast conservation impacts. BPA's ability to properly assess conservation impacts on its obligation to contract customers also relies on effective implementation of this modeling activity. Load Forecasting will also be limited in its' support of short-term market activity and secondary sales under reduced staff levels which may lead to slower response times.

Metering Services is at risk of being able to fully support South Idaho Load Service work, and a delay is expected for metering strategy work. The time for KSM to resolve meter data anomaly research is expected to increase and may impact the ability to provide timely settlement quality data to Billing, Load Forecasting, Scheduling, etc. Response time to customer data requests will also increase.

Challenges

- CSS's succession program will scale back at a time when attrition is expected to escalate.
- The rapid evolution of the energy industry and Federal requirements require greater flexibility in CSS operations to be able to respond to and implement new policies and requirements.
- In order to realize personnel efficiencies, regular and continuous system improvement will be necessary. As utility transactions continue to become more complicated, it will be important to keep systems updated so customers will receive the service they expect. IT spending on these critical systems will continue but the risk will be if there are knowledgeable subject matter experts to implement system improvements and lock-in efficiencies.

5.1.2 Environment, Fish and Wildlife



Program Details

(\$Thousands)	Actuals	Rate Case		Proposed IPR		
	2015	2016	2017	2017	2018	2019
Agency Services G&A Allocations	203	0	0	0	0	0
Power Direct Support	289,819	299,611	307,310	307,842	315,180	315,645
Transmission Direct Support	5,587	6,254	6,395	6,420	6,593	6,789
Grand Total	295,609	305,865	313,705	314,261	321,773	322,434

Description, Purpose and Responsibilities

The Environment, Fish and Wildlife organization reports directly to the COO. Because of this reporting structure, it is an Agency Services organization. However, EF&W costs are not allocated to the business units, as are typical Agency Services costs. The costs are directly charged to Power Services and Transmission Services.

Environment, Fish and Wildlife is responsible for managing the environmental component of BPA's transmission and power sales businesses. This includes environmental analysis and compliance for

BPA projects, programs activities, and implementation and management of BPA's Fish and Wildlife program. Within EF&W are three organizations: Environmental Planning and Analysis, Pollution Prevention and Abatement and Fish and Wildlife Program.

Goals

EF&W ensures that all BPA business functions such as policies, programs and initiatives are carried out in accordance with established environmental laws and their associated regulations such as National Environmental Policy Act, Clean Water Act, National Historic Preservation Act, Endangered Species Act, Northwest Power Act, and relevant state and local regulations and requirements, legal mandates, and prudent business practices. EF&W participates in environmental coordination at the regional level through new and ongoing relationships with other federal agencies, tribes, state and local government, privately and publicly owned utilities, major manufacturers, professional groups, research and development organizations, congressional delegations and committees, natural resource groups and the general public.

Changes from the 2014 IPR

The Environmental Planning and Analysis organization has experienced a significant increase in workload for major environmental analysis. This work has nearly tripled over the past five years.

Pollution Prevention and Abatement has experienced severe staffing shortages over the past year after being unable to fill staff positions.

PP&A has started implementation of facility drainage system upgrades to ensure BPA's compliance with federal and state storm water management requirements which increased expense spending.

Risk for Operating at Levels below the Proposed Spending Levels

The primary impact of operating below the proposed spending level is delay in the implementation of BPA Transmission and Power (including Fish and Wildlife) activities due to insufficient staff to review and screen projects for environmental and cultural resource compliance. There is an increased likelihood of compliance violations, with associated risk of damage to sensitive environmental and cultural resources, significant financial penalties, potentially-significant project delays while mitigation is implemented and loss of reputation with regional stakeholders. Failure to comply with federal environmental laws and regulations such as the ESA or CWA also exposes BPA to serious legal and litigation risks.

Without additional staff and related support, EF&W may be unable to maintain BPA's basic environmental compliance responsibilities, let alone take on new or broader initiatives to address large-scale BPA program areas, or other strategic or innovative measures.

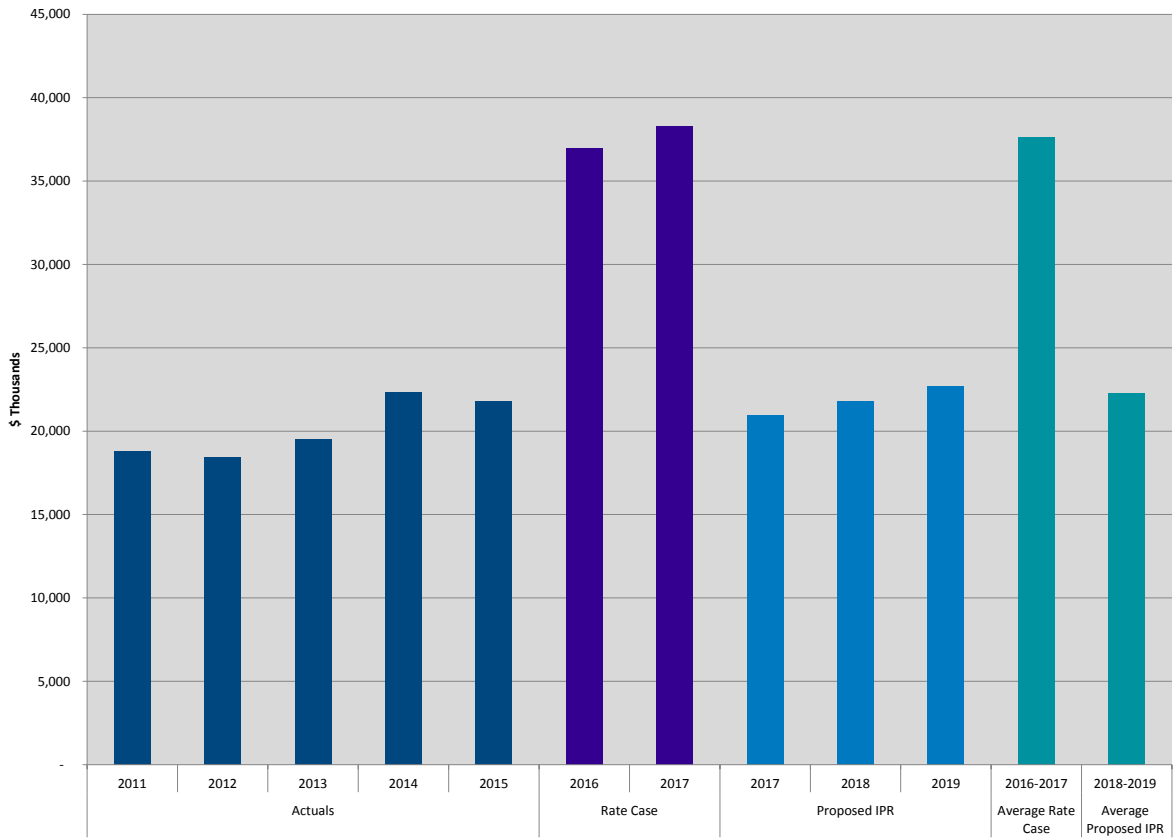
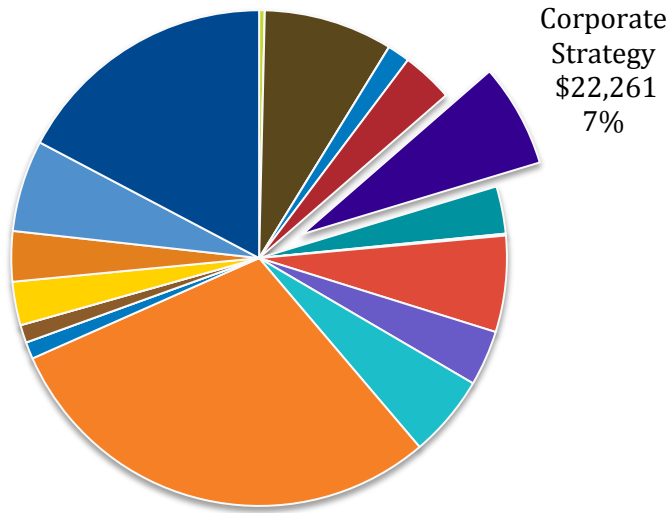
BPA is committed to fulfilling its FCRPS protection and mitigation responsibilities using a performance-based approach, while also assuring an economical and reliable power supply. BPA takes a broad approach considering the entire lifecycle of species: first, hydro actions to improve fish survival, and then habitat protection and enhancement actions and hatchery production to address remaining fish and wildlife impacts of federally owned hydroelectric dams. Failure to fully fund the Fish and Wildlife program could affect BPA's ability to meet its obligations and commitments under the Northwest Power Act, the Endangered Species Act, Tribal trust and treaty responsibilities, and related agreements.

More specific information on these organizations can be found in the specific Power and Transmission programs in which these organization charge.

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5.1.3 Corporate Strategy

FY 2018-19 Average: Proposed IPR Costs



Program Details

(\$Thousands)	Actuals	Rate Case		Proposed IPR		
	2015	2016	2017	2017	2018	2019
Agency Services G&A Allocations	10,952	23,581	22,840	11,935	12,579	13,226
Power Direct Support	6,527	6,033	7,673	5,051	5,153	5,260
Transmission Direct Support	4,341	7,331	7,762	3,997	4,099	4,206
Grand Total	21,820	36,945	38,275	20,983	21,830	22,691

Description, Purpose and Responsibilities

Corporate Strategy exists to position BPA to deliver long-term regional value through informed and thorough strategic planning, technology research and development, strategic initiative implementation, operational excellence competency, and tracking and reporting on BPA's progress against strategic imperatives and performance indicators.

Four teams comprise Corporate Strategy:

Strategic Planning works with BPA's executive leadership to develop the agency's long-term strategic direction, including the agency's strategic objectives, supporting multi-year Key Strategic Initiatives, agency level Key Performance Indicators and business unit balanced scorecards.

Strategy Integration develops and coordinates management of specific cross-agency strategic initiatives in anticipation of, or in response to, developments affecting BPA, the region and the power industry. These include renewable resource integration, climate change, integrated resource planning and market evolution.

Strategy Execution administers and manages enterprise-wide initiatives to ensure operational excellence, change management, and continuous improvement is implemented across BPA's strategic priorities. The team employs best practices, proven quality management systems and process improvement tools. The team works in coordination with the executive operational excellence committee and in support of BPA's KSIs.

Technology Innovation anticipates and addresses BPA's future technology needs and mitigates technology-associated risks by administering a disciplined research management program to identify, test, apply, refine and introduce technology solutions across power and transmission. The team focuses innovation investments through technology road mapping and maximizes program effectiveness with rigorous program management principles.

Goals

- Support strategy and policy development with timely and relevant industry intelligence.
- Ensure BPA accomplishes its strategic priorities by driving agency-level performance management timely, accurate and transparent progress reporting.
- Drive BPA's technology innovation research agenda and actively manage the technology portfolio to maximize the value of FCRPS assets.

- Reduce BPA's future costs through risk managed research, development and demonstration of potentially beneficial technologies.
- Evaluate and prepare for the physical and legislative impacts of climate change.
- Promote and mature operational excellence as a foundational value in the agency reinforcing its importance and visibility at all levels to improve performance through quality process management.

Changes from the 2014 IPR

Accomplishments

Corporate Strategy played an integral part in advancing several priority efforts since the last IPR. These accomplishments required alignment, facilitation, organization and involvement across multiple BPA organizations and often included engagement and coordination with external stakeholders.

Strategy Integration led BPA's engagement with the region to explore regional market solutions, including energy imbalance market and security constrained economic dispatch model. Working with the Northwest Power Pool Management Committee effort, the team collaborated on a wide array of development concepts. The concluded MC effort provides a foundation for BPA's future market evolution activities.

The Strategy Execution team provided critical support for BPA's safety value by providing expertise to BPA's Safety Office for the 2015 and planned 2016 Stand up for Safety event, connecting thousands of employees, managers and executives to discuss safety issues and celebrate accomplishments. The group conducted multiple root cause analysis and process improvement initiatives, supporting KSI execution with project facilitation and change management.

Strategic Planning led an effort to streamline and simplify the framework used to communicate BPA's strategic direction to our employees and external customers and stakeholders. BPA formally retired its previous strategy map and associated 23 strategic objectives and adopted a simplified framework of five refreshed priorities with desired end states, depicted simply with visual icons. Strategic Planning further developed new frameworks for driving organizational performance toward those priorities through adoption of a planning, implementation, and measurement construct of KSIs and KPIs.

Since the last IPR, BPA's technology innovation program delivered solutions across BPA's physical assets and system operations with tangible financial benefits. The organization drove the successful application of synchrophasor technology enabling the potential to simultaneously increase system capabilities and reliability. It developed the helical shunt application which reduces, delays, and eliminates the need for installing new conductors. Technology Innovation invested in a series of projects designed to increase transformer survivability of the Cascadia subduction zone earthquake. The organization has also researched phasor measurement unit investments, supporting more rapid scheduling requirements, dynamic transfers and improving variable resource integration.

Changes

The department responsible for overseeing BPA's capital investment process moved from Corporate Strategy to Finance.

In general, the funding levels for Corporate Strategy were reduced to the level of actual expenditures from fiscal year 2015. Spending levels were further adjusted to reflect the projected composition and costs of work the team will undertake. A few notable changes follow.

Corporate Strategy program funding levels have shifted from 2014 IPR levels in response to specific drivers. Most notably, the Strategy Integration and Strategy Execution program levels were reduced to reflect a transfer of programs and spending levels to the Transmission and Power business units and corporate functions. This transfer recognizes the initiatives' maturity and aligns the associated work with the lead organizations.

Further, some cost of staff embedded in the Power and Transmission business lines who execute approved research and development projects, which had been planned for as part of the Corporate Strategy program level during the 2014 IPR, are being planned for and reflected in the respective business line's cost estimates.

Risks of Operating at Levels below the Proposed Spending Levels

In Corporate Strategy, the two areas most affected by cost targets are the Strategy Integration and Technology Innovation teams. The defined cost target in this IPR represents a 10 percent reduction to the previously anticipated program. This cost target represents manageable risk to the program. However, projects in the Technology Innovation portfolio are, by their very nature, higher risk projects. BPA manages that risk through formal periodic review practices and performance-based pruning to eliminate under-performing projects as early in their investment cycle as possible. This approach successfully manages the risk to program value, but can result in a gap between planned and actual expenditures. The Technology Innovation program will accommodate its cost reduction through a combined strategy of adjusting its planned portfolio scale, adapting its pruning criteria to respond to cost management targets, reviewing its criteria for cost-sharing on projects and researching possible funding partnerships.

The Strategy Integration funding level is planned to accommodate only known, defined work streams and associated contract and labor costs. In the past, the Strategy Integration function was funded in recognition of the dynamic nature of industry changes and the associated need to stand up supporting work efforts.

The Corporate Strategy funding approach proposed here is sensitive to BPA's current cost targets, but creates no flexibility to absorb emerging priority work.

Integrating capital and expense program funding

Not applicable to Corporate Strategy's spending level as there are no capital costs.

Program Funding Flexibilities

Corporate Strategy funding is discretionary to some degree. However, there is a significant distinction between discretionary spending and importance. The activities and function of Corporate Strategy organizes BPA to accomplish its mission, prepare for the future and execute its strategic priorities are paramount. In analyzing flexibilities in program funding, Corporate Strategy costs were categorized against the time horizon on which investments could be ramped-up or ramped-down to respond to changing circumstances.

Overall, the Corporate Strategy funding levels include small amounts of short-term flexible and mid-term flexible costs, with the majority being long-term flexible. Examples of such costs follow.

Short-term costs include portions of BPA's cost of staff, such as travel, training and awards, which can be curtailed as business conditions dictate. Additionally, Corporate Strategy administers the agency's customer, constituent and tribal satisfaction surveys. These costs have short-term flexibility. The agency could decide, in advance, to defer or cancel a biannual cycle of survey administration and adjust the associated program spending level accordingly.

In advance of a funding opportunity announcement for the Technology Innovation program, there is flexibility to adjust the scale of the funding administered, and by extension, the breadth and depth of research undertaken. These costs are short-term flexible, however once funding for a portfolio cycle has been established, the program's costs become somewhat more inflexible. As a result, Technology Innovation project funding costs are split across short-term and mid-term categories, with the bulk of the Technology Innovation costs considered to be flexible over a mid-term horizon of one to three years.

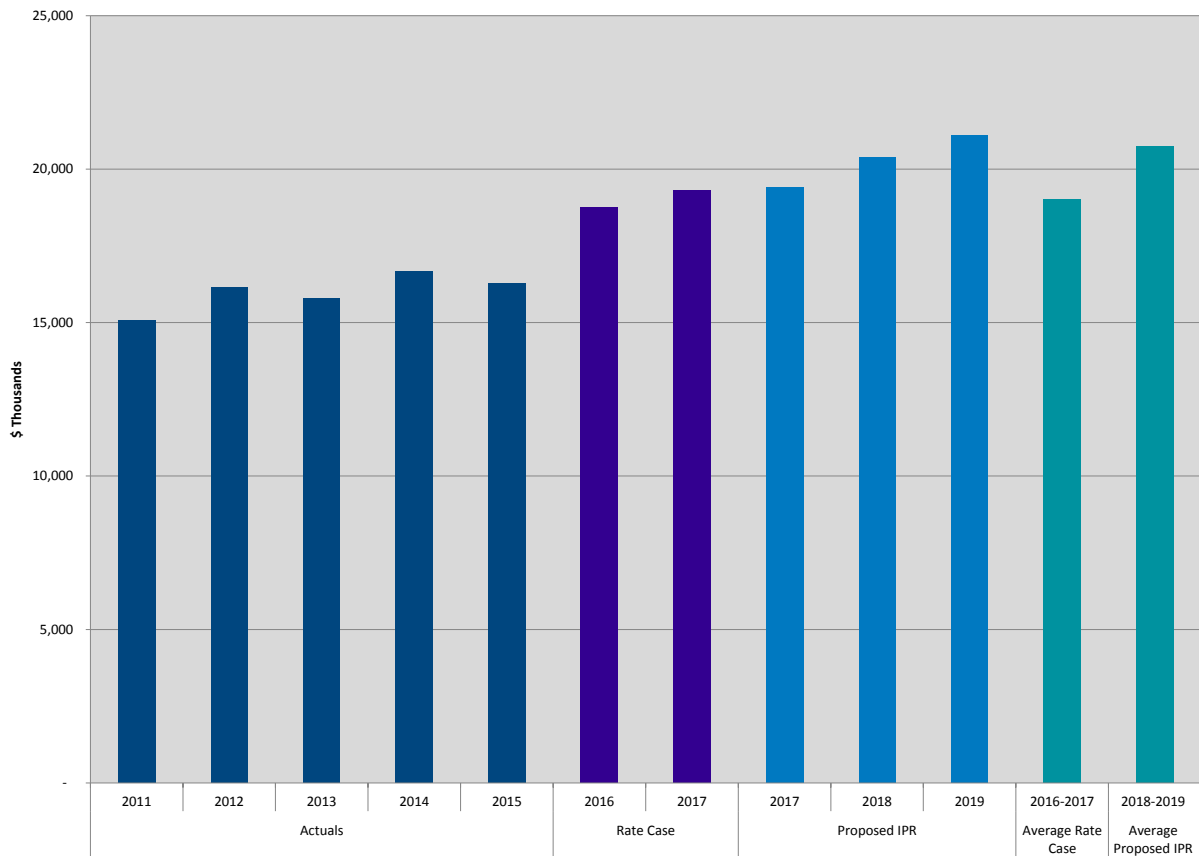
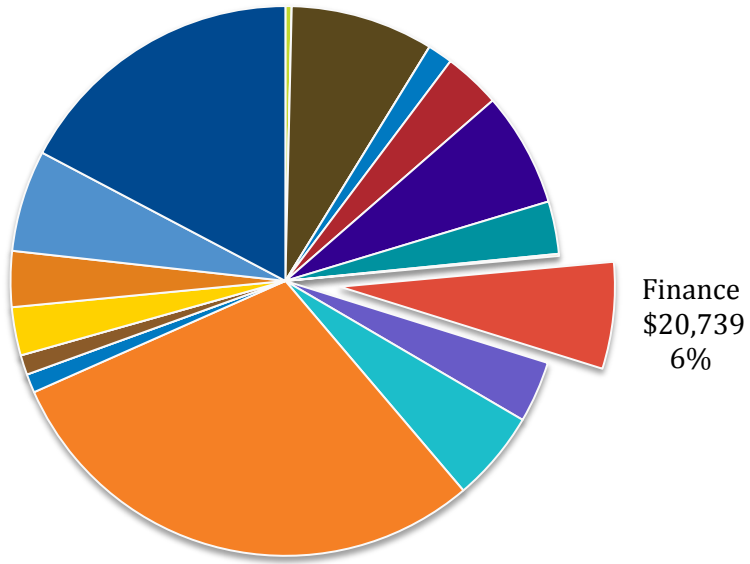
Many other service contracts and supplemental labor costs across Corporate Strategy have a mid to long-term flexibility profile. Contracts and work efforts are often complex, involving multiple internal and external stakeholders and time to plan, align and execute investment adjustments with care and attention to detail. The higher the complexity of a work effort, the longer the agreement's terms, or the larger the stakeholder community impacted, the lower the flexibility assigned.

Finally, BPA workforce costs are categorized as flexible over a long-term period. These include the cost of workforce directly reporting to Corporate Strategy as well as portion of cost of staff administered by Technology Innovation, but subsequently transferred to business units for implementation.

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5.1.4 Finance

FY 2018-19 Average: Proposed IPR Costs



Program Details

(\$Thousands)	Actuals	Rate Case		Proposed IPR		
	2015	2016	2017	2017	2018	2019
Agency Services G&A Allocations	16,234	18,739	19,292	19,390	20,373	21,106
Power Direct Support	49	0	0	0	0	0
Transmission Direct Support	3	0	0	0	0	0
Grand Total	16,285	18,739	19,292	19,390	20,373	21,106

Description, Purpose and Responsibilities

Finance provides financial planning, accounting and reporting for the FCRPS and BPA. The organization also provides economic and analytical support for rate case and regulatory proceedings, and plans, coordinates and executes all Treasury and non-Federal financing programs. It provides cash and reserves management. Finance has primary responsibility for relationships with Federal and non-Federal banking communities, rating agencies, investors and others in the financial community. The organization also has primary responsibility for the development of agency spending levels. Finance performs oversight and transaction processing of accounts receivable, payables, payroll and travel. Finance also leads the design and oversees the implementation of agency processes for creating, selecting, executing and evaluating the performance of capital investments.

Goals

- Continue to make all Treasury payments in full and on time by setting rates to recover costs, aligning spending levels to achieve this goal and monitoring actual expenditures and revenues compared to forecasted expenditures and revenues, allowing BPA to make decisions when necessary to ensure making the annual Treasury payment.
- Assure appropriate accounting treatment and transparency to achieve an unqualified (clean) audit opinion.
- Continue to develop and follow strong internal controls (A-123).
- Support high ratings on BPA-backed bonds.
- Develop and implement alternative funding tools.
- Refine the agency capital spending level process through prioritization and allocation to ensure BPA optimizes investments.
- Assure that asset categories prepare and submit asset strategies and plans that inform the development of long-term capital and expense levels.
- Review and approve major capital investments.
- Establish and maintain agency-wide asset management policies and procedures.
- Continue to manage and conduct the combined IPR/CIR and Quarterly Business Review processes to provide financial information, adequate coordination and communication, and transparency to meet varying audience expectations.

Changes from the 2014 IPR

- Resources have been devoted to researching, analyzing access to capital funding tools and developing longer term debt management strategies. Our focus has shifted to long-term affordability through rates and how to effectively manage our debt portfolio to facilitate long-term affordability and financial health.
- Due to an agreement with the U.S. Treasury BPA is phasing out of the Interest Offset Credit (IOC) and simultaneously phasing into investments offered by the U.S. Treasury. BPA is actively preparing to manage short term cash which requires improved cash forecasting and liquidity management oversight.
- The department responsible for overseeing BPA's capital investment processes was moved from Corporate Strategy to Finance.
- Third party financing for Transmission projects has advanced and become a critical component of BPA's capital financing strategy.
- Finance began leading the following agency-wide KSIs:
 - Business Information Systems
 - Asset Management
 - Long-term Finance and Rates
- Finance has increased its focus on cost management as part of the Long-Term Finance and Rates KSI. BPA will be evaluating best practices for cost management and performing a gap assessment. Then BPA will hire and/or train analysts to provide more thorough financial analysis and cost management support for the agency.

Trade-offs Made Between Programs

Finance's objective for developing spending level estimates for the IPR was to keep spending levels as low as possible to accomplish priority activities and not exceed the FY 2015 actual spending baseline amount. In order to achieve this objective, the Chief Financial Officer and senior finance managers discussed several trade-offs to control costs and make the best use of resources.

- Personnel costs are the primary component of Finance's spending level estimates, thus the majority of the trade-offs considered were around personnel assumptions. Paying wages to employees is not a discretionary cost, however, timing of hiring and how we address workload are tools to be used to manage spending levels.
- Finance is forecasting an increased wave of retirements in the next five years. As people have separated from BPA in FY 2016, Finance has evaluated whether or not to fill behind them, and if so, at what grade level.
- The mix of Federal and contract employees was evaluated. As Finance expects to hire Federal employees, a reduction of supplemental labor is assumed.
- Finance also evaluated, what workload and resources can be shifted across Finance to make the best use of the people it currently has on board. Finance also discussed ways to try to maximize the amount of time that staff spends on high priority and/or mission critical work.
- Cost management is a long-term, on-going effort. As circumstances change with personnel over time, Finance will continue to evaluate the most cost effective and efficient alternatives when

making staffing decisions.

Program Funding Flexibilities

As noted above, personnel costs are the primary component of Finance's spending level estimates. In general, personnel costs are a long-term fixed cost. However, because of the anticipated number of retirements and supplemental labor staffing, a small portion of Finance's spending level estimates can be considered short-term flexible and medium-term flexible. The majority of Finance's spending level estimates can be considered to be long-term fixed. This takes into account the nature of the Finance organization's work and what work is really discretionary. After review of the work in Finance, it has been determined that very little of the Finance work is actually discretionary; however, Finance is planning to allocate more resources to cost analysis and management efforts in the future, through redeployment.

Risks of Operating at Levels below the Proposed Spending Levels

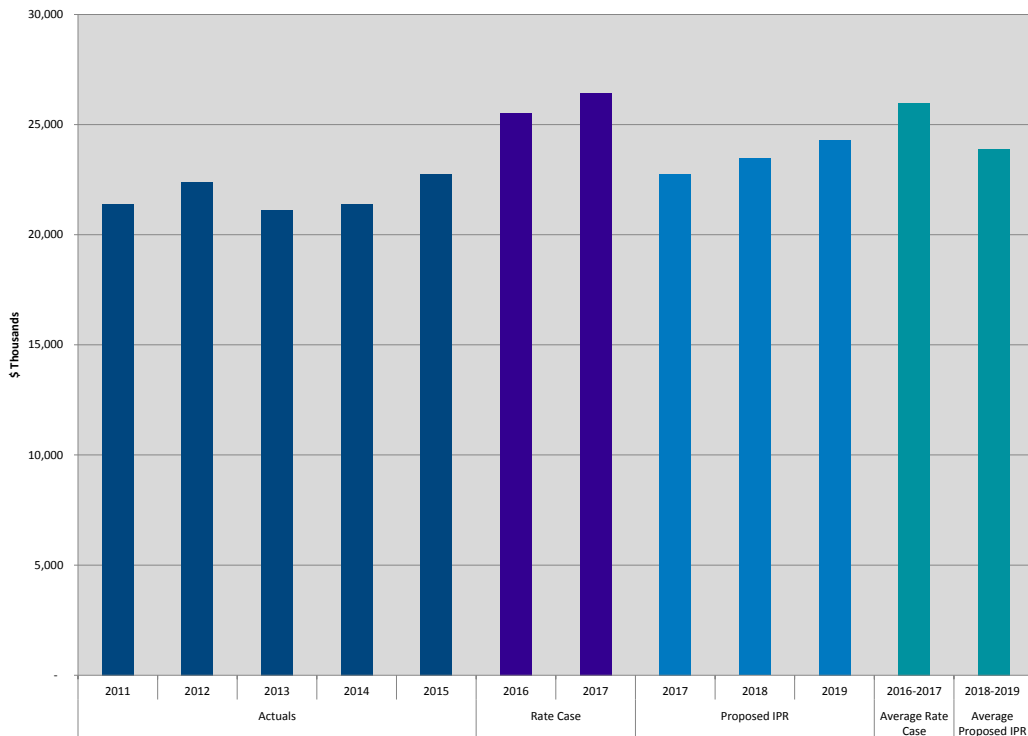
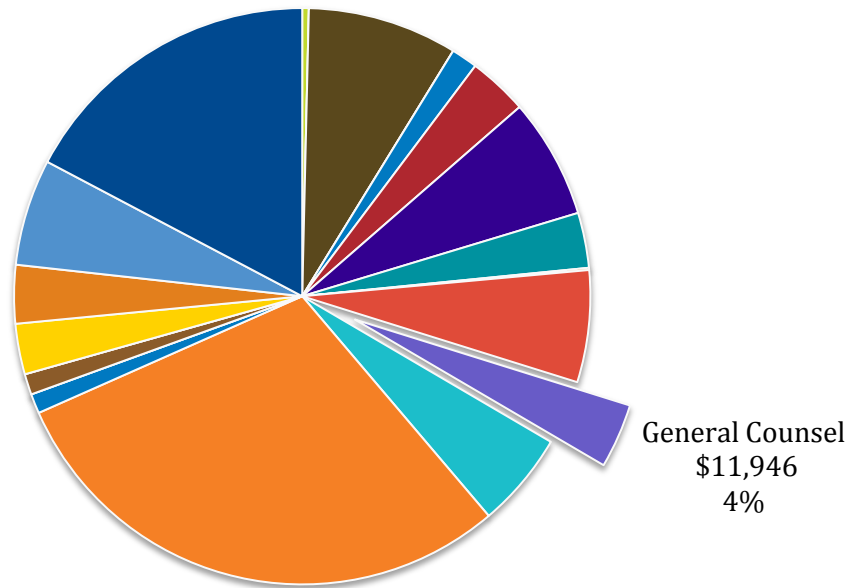
Insufficient funding of the Finance function would put at risk the ability to meet federal and commercial accounting and reporting requirements, management of BPA's large debt portfolio, access to capital initiatives, and day-to-day fiduciary responsibilities.

Challenges

- Obtaining visibility and transparency at the agency level of the overall capital investment portfolio to assess to what degree the planned investments are actually being delivered and the value of these investments is being realized.
- Access to capital is a key challenge. BPA's U.S. Treasury borrowing authority is limited by law and capital investment is forecast to average close to one billion annually over the next ten years due to aging infrastructure. This challenge has caused BPA to perform a comprehensive review of how the debt portfolio is managed with an emphasis on maintaining long-term financial health and affordability.
- Alternate forms of capital such as lease financing are much more labor intensive to implement and manage than Treasury borrowing.
- As federal accounting requirements increase, particularly relating to intergovernmental financial reporting, more work with the financial and other agency systems will be needed to satisfy Federal reporting requirements.

5.1.5 General Counsel

FY 2018-19 Average: Proposed IPR Costs



Program Details

(\$Thousands)	Actuals	Rate Case		Proposed IPR		
	2015	2016	2017	2017	2018	2019
Agency Services G&A Allocations	4,494	4,929	5,014	6,944	7,160	7,366
Power Direct Support	3,701	4,501	4,648	2,772	2,875	2,983
Transmission Direct Support	3,162	3,331	3,548	1,641	1,716	1,792
Grand Total	11,357	12,760	13,210	11,357	11,751	12,142

Description, Purpose and Responsibilities

The Office of General Counsel provides legal advice and representation for or in connection with all BPA activities. It charges directly to Power and Transmission Services when supporting projects exclusively for the business unit. However, it also has costs in support of general agency initiatives and activities which are allocated to the business units. The support covers the gamut of legal representation from provision of legal advice to representation of the agency in all areas of claims, and administrative or judicial litigation. This general support function covers the Columbia River Treaty; storage agreements; corporate authority, governance and delegations; financial management; tribal issues; fish and wildlife program support; procurement of goods and services; tort claims; Freedom of Information Act/Privacy Act; employee claims; ethics, including conflicts of interests and financial disclosure; human capital issues, including labor issues, disciplinary actions, reasonable accommodations requests, and EEO claims; copyright and patent issues; and security processes and procedures.

Goals

OGC's goals and priorities are to continue to provide advice related to, and defend actions associated with, the widely varying functional areas identified above. All issues are important, but more activity is expected than is ordinarily the case associated with Treaty review; changing energy market environments; Bonneville Power authority issues; litigation, contracts and activities associated with the fish and wildlife program; procurement issues associated with infrastructure development; human resources and possibly cyber security issues. The goal is to assist the agency in making informed, risk-based decisions that are defensible; assist in documenting decisions so that they are appropriately thorough and articulated; and defend, or assist in the defense of, challenges to those actions.

OGC's strategy to provide these services is to ensure attorneys are trained and knowledgeable in the area of representation, and teamed closely with policy and technical staff to assure responsive and collaborative representation. If outside counsel is needed in an area beyond OGC's expertise, or when it is more cost-effective (e.g., specialized counsel such as tax or bankruptcy counsel), it will be secured.

Changes from the 2014 IPR

The primary drivers of costs are the increased amount of legal support work in the areas of alternative financing, personnel, procurement, lands, emerging market structures, FOIA, 2014 and 2018 Biological Opinion needs, and NEPA. Offset by reduced requirements in the areas of residential exchange, Regional Dialogue power sale contracts, direct-service-industry service and west coast power crisis.

Risks of Operating at Levels below the Proposed Spending Levels

Insufficient funding of legal services would compromise Bonneville Power's ability to complete market transactions, such as bond work and third party financing and also smaller transactions in support of customer contract needs. It would also jeopardize BPA's ability to participate in litigation, ranging from support of Department of Justice actions (e.g., California Refund case, Biological Opinion) to actual representation in forums such as the Federal Energy Regulatory Commission (e.g., California Independent System Operator and investor owned utility tariff filings, reliability standards). Significant delays to agency initiatives would likely be felt by customers and agency staff as legal resources were prioritized (e.g., rate case and litigation matters are completed before contract reviews and policy questions). Inadequate funding of outside counsel would bring continuation of the debt optimization program into question, and it would also significantly increase risk exposure in matters requiring specialized legal support. Without this funding, work in the areas of taxation, bonded indebtedness (e.g., Energy Northwest bonds), lease financing, and securing alternative sources of financing (e.g., Port of Morrow, prepaid debt) work would have to be prioritized to tax audits and unavoidable work. Refinancing results in significant savings, and a portion of that would be lost. Similarly, work on alternative sources of financing would be inadequate due to the absence of outside counsel.

Trade-offs

To reach the IPR proposal of meeting FY 2015 spending levels, OGC undertook a line-by-line review of forecasted spending. Personnel costs make up the bulk of the spending and are fixed costs in the short-term. As vacancies occur, General Counsel considers whether the position needs to be filled and at what level. General Counsel also applied a burn rate to capture typical underspending that occurs during the hiring process. In addition, OGC committed to significantly reduced levels of supplemental labor and law clerk support. The next largest expense in the OGC spending level is for outside counsel. These costs were scrubbed internally and with clients to get to the lowest possible forecast levels. Other reductions were also found, such as reducing the number of hearing officers under contract.

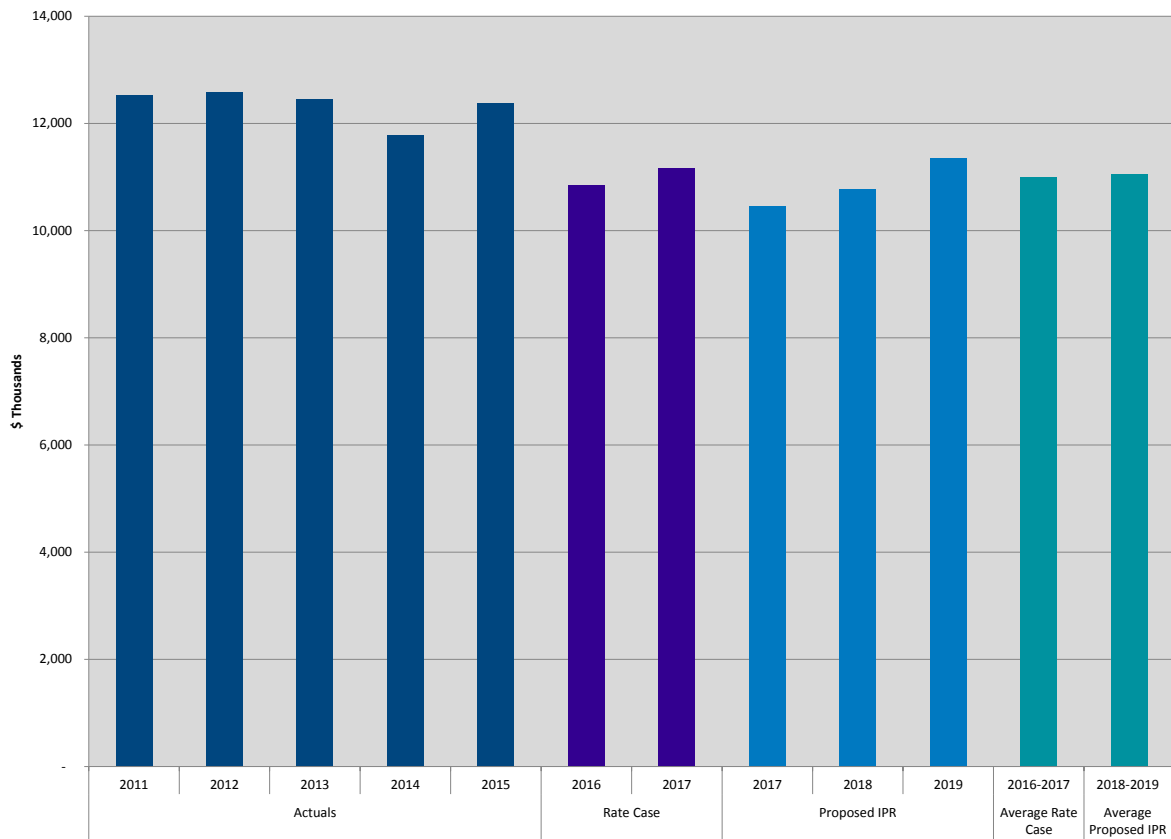
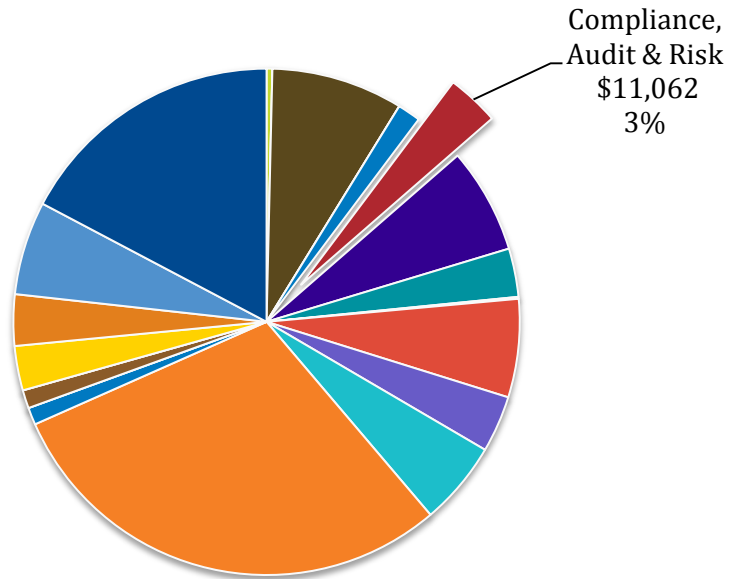
Firm vs Flexible

OGC's spending level is almost entirely personnel driven and has no programs, only legal services; thus the workload is dependent on the needs of the agency.

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5.1.6 Compliance, Audit and Risk Management

FY 2018-19 Average: Proposed IPR Costs



Program Details

(\$Thousands)	Actuals	Rate Case		Proposed IPR		
	2015	2016	2017	2017	2018	2019
Agency Services G&A Allocations	10,230	10,843	11,170	10,467	10,773	11,350
Grand Total	10,230	10,843	11,170	10,467	10,773	11,350

Description, Purpose and Responsibilities

The Compliance, Audit and Risk Management organization is comprised of four organizations that previously reported independently to the Deputy Administrator, but have now been consolidated into one reporting structure headed by the Executive Vice-President of Compliance, Audit and Risk Management:

Agency Compliance & Governance is led by the Chief Compliance Officer and oversees a broad array of compliance and governance functions at BPA including agency level FERC compliance, policy management, Office of Management and Budget circular A-123 compliance, information governance, purchasing policy governance, and management of BPA’s workplace concerns program and BPA hotline.

Audit is led by the Chief Audit Executive and provides independent, objective assurance and consulting services designed to evaluate and assist BPA by bringing a systematic, disciplined approach to evaluate and improve the effectiveness of its internal control, risk management and agency governance processes. The overall objective is to provide reasonable assurance that BPA is compliant with laws and regulations, has efficient and effective operations and has reliable financial reporting.

Risk Management is led by the Chief Risk Officer and is comprised of the Enterprise Risk Management and Transacting, Credit and Insurance Risk Management functions. Risk Management’s mission is to enable high quality and durable business planning and decision making that improves the likelihood that the agency achieves its business objectives.

Civil Rights & EEO is led by the equal employment manager and is responsible for Equal Employment Opportunity Title VI and VII compliance and resolution programs.

The consolidation of the Compliance, Audit and Risk Management organizations under one umbrella will result in better integration of the governance, risk and compliance framework throughout BPA and ultimately yield efficiencies and improved agency oversight of its mission critical objectives and regulatory obligations.

Goals

Implement a rigorous governance, risk and compliance framework that will provide reasonable assurance that:

- Risks with agency-wide scope or impact are identified and addressed through a consistent and

disciplined process.

- Regulatory compliance obligations are well-understood and compliance with those obligations is managed such that the administrator gains reasonable assurance of compliance.
- Internal control framework is robust and functioning to reduce risks to key objectives.
- Independent validation that risks are being appropriately mitigated and controls over mission objectives, regulatory compliance, and financial reporting are operating effectively.

Changes from 2014 IPR

Changes from 2014 IPR including accomplishments from last two years

- Completed the implementation of the agency Corrective Action Program
- Implemented the Transmission property insurance program (actual cost less than IPR14 forecast)
- Organizational changes for a more effective CAR organization:
 - Movement of FOIA from the CAO into the Compliance and Governance Function
 - Moved certain diversity functions previously performed by Civil Rights & EEO to the Diversity & Inclusion Office of the CAO
- Changes in staffing levels include:
 - Governance and Internal Controls group reduced by 2 BFTE
 - Internal Audit increased by 4 FTE and
 - Risk reduced by 1 FTE

Trade-offs and Firm vs Flexible elements of cost structure

- Trade-offs: To achieve the baseline numbers, Internal Audit committed to not fill three entry-level positions. This will greatly impact our ability to complete the full scope of work on our annual audit plan and will significantly hinder succession planning efforts. OMB A123, Appendix A internal controls testing will have to be completed by senior auditors, rather than entry level staff, limiting the ability of senior auditors to conduct audits in high risk areas from the audit plan or engage in consulting work for managers around the agency.

Firm vs Flexible:

- The vast majority of the CAR spending is to cover personnel compensation and benefits costs, the remaining costs are equally split between service contracts and training-related costs.
- Short-term flexible:
 - 1 CFTE in Forms Management – we would no longer have forms development capability as a service, nor would we ensure that forms are being managed consistently as to types of information captured such as PII, etc. Our backstop would be the continuing Privacy Act/PRA activities after-the-fact.
- Mid-term flexible:
 - Transmission property insurance premiums
 - Scale back of the Regulatory Compliance Program/Policy Program functionality

- EEO – BPA would be operating below current capacity which could impact service delivery. There are established guidelines issued by EEOC that the agency must meet. Additionally, the Title VI efforts of monitoring and evaluating performance related to meeting DOE business utilization targets will be impacted.
- FOIA – this will likely significantly increase the ‘time-in-process’ for requests and leave BPA without some expertise with some exceptions.
- OMB Circular A-123 Risk Assessment / Fraud Risk Assessment would not fully be covered and the time to report out would be significantly increased.
- Long-term flexible:
 - BFTE, NEIL nuclear insurance, service contracts for credit risk management
 - Cease all activity for the Paperwork Reduction Act compliance and focus solely on Privacy Impact Assessments processing.

Integration of Capital and Expense

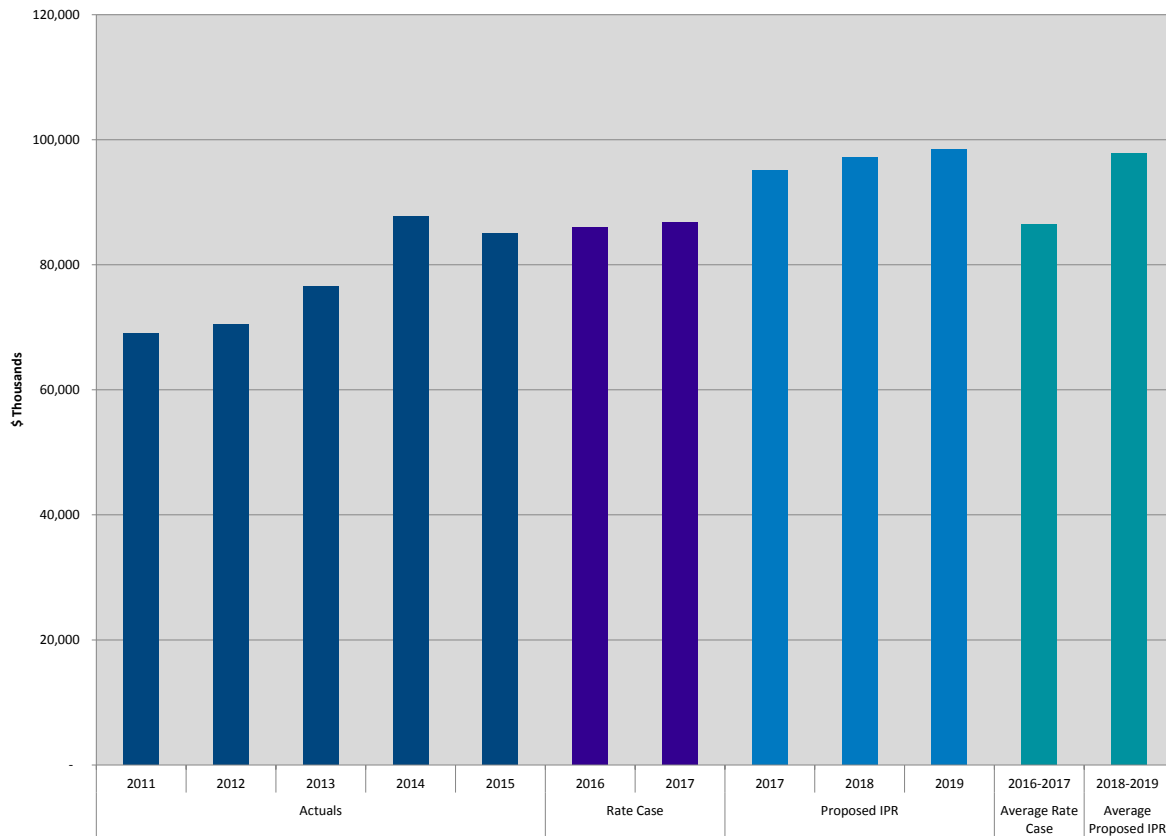
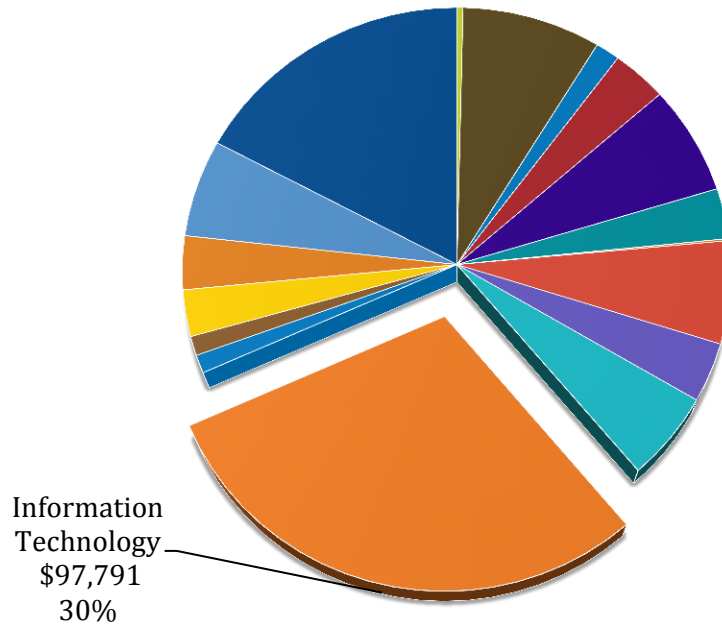
There is no capital included in the CAR proposed spending levels.

Risks of Operating at Levels below the Proposed Spending Levels

Operating at spending levels below the proposed levels would require reductions in agency staff and/or reductions in insurance coverage. This would effectively eliminate or reduce important elements of the agency compliance, audit and risk management program.

5.1.7 Information Technology

FY 2018-19 Average: Proposed IPR Costs



Program Details

(\$Thousands)	Actuals	Rate Case		Proposed IPR		
	2015	2016	2017	2017	2018	2019
Agency Services G&A Allocations	84,851	85,961	86,831	95,012	97,136	98,446
Power Direct Support	196	0	0	0	0	0
Grand Total	85,047	85,961	86,831	95,012	97,136	98,446

Description, Purpose and Responsibilities:

Information Technology develops and supports agency-wide business automation and provides governance, planning and standards for the agency's information technology activities. IT has overall responsibility and accountability for all BPA information technology-related, or all non-grid operations, programs. This includes maintenance of assets covering telecommunications components, network circuits, servers, storage devices, desktop systems, printers, copiers, faxes, phone systems and software. The software assets are further categorized as critical business systems, general business systems and task systems. Critical business systems must operate around the clock to enable power marketing and transmission scheduling functions. General business systems allow BPA to manage its staff, finances, facilities, supply chain, transmission assets and services such as managing circuits and work planning services. Task systems are small web based applications that enable BPA staff to perform work more efficiently.

Goals

- Deliver new and improved applications to meet the agency's business needs.
- Improve system reliability and performance by maintaining business applications on current refresh cycles. Further drive reductions in the total cost of ownership of end user devices through continued deployment of virtual desktop infrastructure, standardized printing solutions, automated software deployment and user provisioning.
- Improve business productivity by delivering advanced process automation and greater business analytics and reporting capabilities.
- Reduce costs and improve flexibility and agility through increased adoption of cloud based solutions (software as a service, platform as a service and infrastructure as a service).
- Increase cyber threat awareness and responsiveness by implementing and staffing a premier cyber security group.

Changes from the 2014 IPR

We are shifting the emphasis of our asset strategy from being heavily tilted toward achieving cost efficiencies to the combination of becoming a more effective strategic business partner and leveraging technology to achieve both business needs and cost efficiencies.

We have begun to strengthen the partnership between business lines and IT to help develop longer-term strategies and roadmaps for our business systems. As an example, the Business Enterprise Services Strategy team is developing a strategy and roadmap for our major Human Capital, Finance,

Contracts, Billing, Transmission Asset Maintenance, Project Planning, and Supply Chain systems (see chapter on Application Portfolio in the IT Asset Strategy for details).

Increases in the IT expense spending level are driven by inflation and the expense expenditures required to support capital spend. The figure below shows the IT expense request and forecasted expense needs. As a rule of thumb, IT requires 20 percent of the total capital investment in expense to develop the business case, perform requirement gathering and analysis, perform the analysis of alternatives and to plan the project. Once the new system is delivered into production, the net new annual operation and maintenance associated with the investment is 8 percent of the investment. IT always looks to achieve efficiencies to reduce the trajectory of forecasted spending however costs for technology development and support continue to escalate at rates higher than inflation.

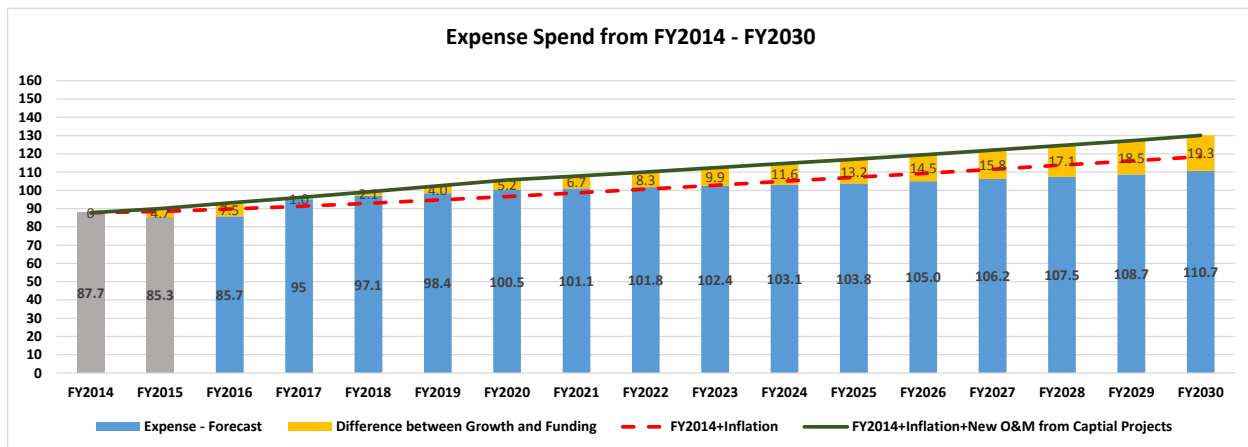


Figure 1: Forecasted Expense Based on Capital Spend

The proposed capital levels are based on anticipated new systems and systems replacements to meet business objectives. Capital spending results in some net expense increase to accommodate the planning phase and then to support net new operations and maintenance costs, net of systems that can be retired.

Risks of Operating at Levels below the Proposed Spending Levels

Automation provides the agency the means to meet evolving business needs, evolving compliance requirements, and to achieve efficiencies and cost savings. The IT spending represents a shaping of capital and expense dollars to meet the known requirements; however, there are risks with the proposed levels. These risks include the ability to meet emerging business requirements and the ability to fund software upgrades and infrastructure refreshes.

Historically, IT has not increased operational spending levels to cover the “expense tails” (see Figure 1) of delivered IT systems; the net result has been that the expense tail caused some spending increases. As a consequence, many major upgrades to existing systems have been delayed. Not upgrading or patching the software in a timely manner increases risks of cyber security exposure. Our enterprise applications will collectively have large expense requirements to bring them up to the current versions.

Also, as mentioned previously, expense funds are needed to perform planning for capital investments. Insufficient expense funding may require capital investments to be deferred or dropped even though capital funds are available.

5.1.8 Information Technology — Capital

Program Details

(\$Thousands)	Actuals	Rate Case		Proposed CIR			FY 17- 19 Total
	2015	2016	2017	2017	2018	2019	
Asset Category Direct Spending							
IT	30,997	32,800	25,386	25,000	25,000	25,000	75,000
Direct Total	30,997	32,800	25,386	25,000	25,000	25,000	75,000
AFUDC	1,573	2,100	1,238	1,032	658	659	2,349
Grand Total	32,570	34,900	26,624	26,032	25,658	25,659	77,349

(\$Thousands)	Remaining CIR						
	2020	2021	2022	2023	2024	2025	2026
Asset Category Direct Spending							
IT	2,500	12,000	4,736	6,536	14,761	15,058	15,351
Direct Total	2,500	12,000	4,736	6,536	14,761	15,058	15,351
AFUDC	380	257	331	256	427	573	593
Grand Total	2,880	12,257	5,067	6,792	15,188	15,631	15,944

Description, Purpose, and Responsibilities

Information Technology assets include: circuits, servers, storage devices, desktop systems, printers, copiers, faxes, phone systems and software, including applications provided as Software as a Service (SaaS). The software systems covered by this strategy include critical business systems, general business systems, web applications and task systems. Critical business systems must operate and be available around the clock or 24/7. General business systems enable BPA to manage its staff, finances, facilities, supply chain, transmission assets and services such as managing circuits and work planning.

Objectives of this Strategy

There are two major outcomes to the strategy:

- Evolving the infrastructure to meet emerging security threats and providing reliable services while lowering operations and investment costs; enabling those cost savings to be used to meet business needs.
- Meeting strategic and emerging business needs by providing business solutions which deliver demonstrable positive net value and benefits to the agency and the Pacific Northwest.

To support reliability, hardware assets are refreshed based on a combination of industry best practice schedules and BPA's desire to optimize the value of its investments. IT applications are

maintained while the systems continue to meet business needs and remain cost effective. Maturing our ability to measure the business value provided by each application or system is a cornerstone of this approach.

Strategic Challenges

IT at BPA faces a number of challenges, which can be grouped into the following categories: compliance, IT challenges and strategic partnership:

Compliance

- Increasing North American Electric Reliability Corporation Critical Infrastructure Protection regulation.
- Rising bar for Cyber security.
 - Evolving threats.
 - Cyber security operation center.
 - Refactor or replace legacy system to address security vulnerabilities.
- Federal guidance.
 - Implementing ICAM/HSPD-12.
 - OMB cloud first guidance.
- Continuity of Operations Plan and disaster recovery.

IT Challenges

- Rate of change in IT.
- Rise of cloud based solutions.
- Competing for capital and expense for projects less than \$3million.
- Managing expense commitments for project execution, enhancements and covering net new O&M costs.
- 25 percent of workforce is projected to retire by 2020 and 50 percent by 2025.

Strategic Partnership

- Aligning IT and business objectives through asset plans (identifying new out-year projects and investments).
- Developing strategies to address aging applications/business systems –prioritizing development and deployment of business solutions based on agency’s strategic priorities and net value.
- Identifying and tracking business value.

Improving our security posture continues to be a major component of our program. This may include refactoring code to meeting higher security standards/controls – standards and controls continue to evolve as threats continue to evolve. Some systems cannot be refactored and may need to be replaced.

Major Elements of the Strategy

We are shifting the emphasis of our asset strategy from being heavily tilted toward achieving cost efficiencies to a combination of becoming a more effective strategic business partner and leveraging technology to achieve both business needs and cost efficiencies. BPA's strategic priorities and the KSIs' objectives will require that information management be a shared center of excellence between business and IT organizations. Moving towards this goal, KSI teams for the Asset Management KSI, Long-term Finance and Rates KSI, Business Information Systems KSI and Commercial Operations KSIs are all developing a transformation strategy and roadmap.

Although, critical assets are meeting continuous operations, or COOP, requirements, our non-critical business assets also have 'return to operation' requirements after a major event, commonly referred to as disaster recovery, or DR. Each asset portfolio contains availability improvement initiatives that are being woven into a combined strategy to achieve DR business requirements.

Results to be achieved

Our major initiatives will be updated and aligned with our KSI transformational strategies as they are completed.

Spending levels

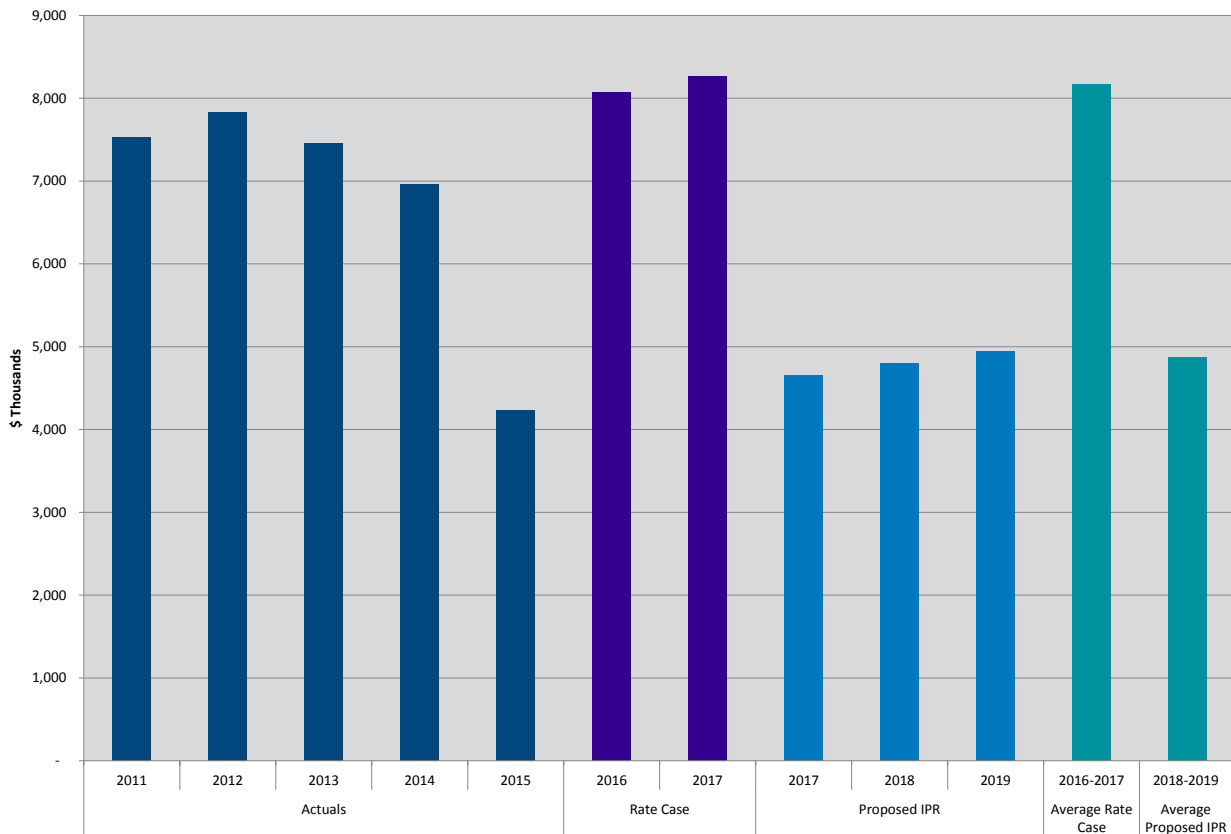
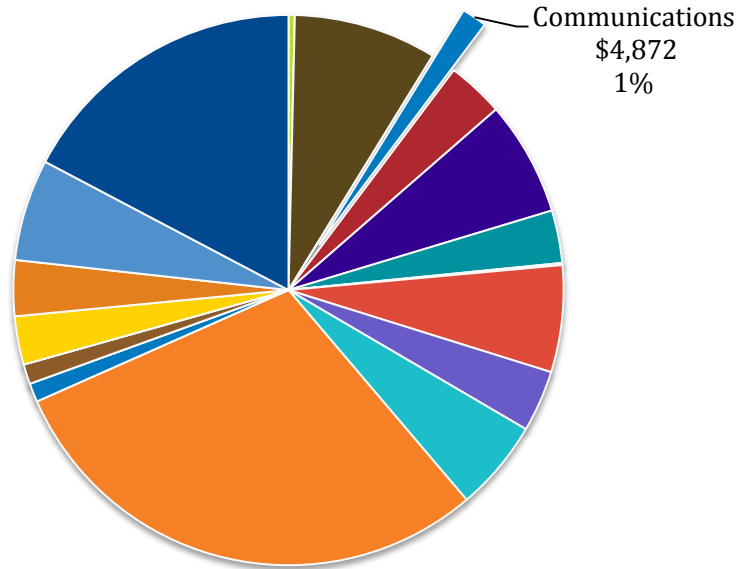
We anticipate that the out year funding levels may change depending on the specific projects that are approved and the replacement cycles for equipment, however changes would not increase total funding proposal for the CIR period. Given the rapid rate of change in IT, coupled with emerging business and compliance requirements, there is uncertainty associated with the proposed spending levels. Figure 5.2.8.2 includes a list of drivers that are introducing uncertainties into the IT funding profile. These uncertainties are discussed in detail in the Overview chapter and each of the asset portfolio chapters of the IT Asset Strategy.

Uncertainty Driver	Impact	
	<i>Expense</i>	<i>Capital</i>
Adoption of larger number of cloud-based solutions than planned	Increases	Decreases
Unplanned regulatory compliance due to emerging security threats.	Increases	Increases
Unplanned emerging business needs resulting in unscheduled projects.	Increases	Increases
FITARA requires all IT acquisition to occur under the CIO. As IT acquisitions that have been occurring in other organizations (often referred to as shadow IT) are identified and moved/consolidated under the CIO, the IT spending	Increases	Neutral
Spending level constraints may push out developing and/or implementing our strategy roadmap resulting in the delay of projects which shift spending to the out years.	Defers	Defers
Upon completion of KSI strategies we may find that we have underestimated the cost of projects to implement on strategy roadmap.	Increases	Increases

Figure 5.2.8.2: Expense and Capital Uncertainty Drivers

5.1.9 Communications

FY 2018-19 Average: Proposed IPR Costs



Program Details

(\$Thousands)	Actuals	Rate Case		Proposed IPR		
	2015	2016	2017	2017	2018	2019
Agency Services G&A Allocations	4,237	8,070	8,265	4,657	4,796	4,949
Grand Total	4,237	8,070	8,265	4,657	4,796	4,949

Description, Purpose and Responsibilities

The Communications Department directly supports BPA’s mission by communicating about the agency’s initiatives, programs, policies and activities to the Bonneville workforce, our electric utility customers, Northwest ratepayers, our partners, the general public and other stakeholders. The team of professionals who oversee BPA’s official communications are entrusted with informing, educating and engaging our audiences through collaboration and dialogue delivered via many communication vehicles. We also serve as the agency’s eyes and ears, staying abreast of key issues, trends, developments and expectations, and provide feedback and information to our leadership team and employees. As professional communicators, we aim to provide helpful and relevant counsel while also delivering results in a strategic and effective manner.

As BPA’s official communicators, we owe it to our client organizations and the ratepayers we ultimately serve to perform our work at a high standard and to produce quality products. We accomplish this through four integrated groups: Media Relations and Policy Communications and Web, Public and Community Engagement, Employee Communications and Graphic Services and the BPA Library and Visitor’s Center. As an integrated team, we manage BPA’s strategic communications plan, develop and provide messages about BPA’s business, public and tribal trust responsibilities to internal and external audiences, and work with BPA business units to ensure a consistent, strategically aligned communication program.

Communications staff works with each business line to:

- find the most strategic and effective ways to demonstrate to target audiences that BPA values and supports its talented workforce;
- influence the long-term understanding by target audiences that BPA works for a common interest: The people of the Pacific Northwest;
- leverage BPA’s five priorities in order to educate target audiences how we both prudently manage our costs and provide regional benefits, and;
- boost awareness among target audiences of how BPA is making investments and taking actions today to prepare the region for the future.

Communications staff also works to equip agency leaders and representatives with the tools and information needed to engage customers, tribes and local, state and federal governments, other constituents and the media to promote a mutual understanding of the needs of the region and agency. The staff also promotes public engagement and awareness through public meetings, public comment processes and participates as a partner with agency leadership to develop clear, meaningful messages that best define the agency’s goals and direction.

Goals

Near-term goals include:

- Engaging customers and other interested parties in strategies for BPA's long-term financial position, including IPR/CIR and Focus 2028 forums.
- Supporting continued engagement for the Columbia River Treaty regional recommendation.
- Supporting community engagement for non-wires and congestion management projects.
- Supporting the preparation of the 2018 FCRPS Biological Opinion and associated compliance with the National Environmental Policy Act, including employee information and external engagement.
- Supporting BPA initiatives for improved system operations through solutions for transmission operations and planning; balancing, and reliability and appropriate capital investments.
- Coordinating messaging and outreach with our partners in Intergovernmental Affairs.
- Sharing details about unique operating conditions, requirements and evolving policy changes that present opportunities and challenges for the FCRPS.

Long-term goals include:

- Supporting regional processes for effective implementation of BPA's fish and wildlife mitigation obligations.
- Supporting operational decisions to address transmission operational challenges and investment decisions, including non-wires options.
- Supporting biannual rate case processes.
- Supporting internal safety program and awareness.
- Supporting biannual program reviews and special events and processes, i.e., Focus 2028.
- Supporting the communication of and implementation of federal laws, Department of Energy initiatives, regulatory requirements, new compliance obligations and other policies.

Risks of Operating at Levels below the Proposed Spending Levels

The impact of operating below the proposed spending levels would have visible impacts:

- Reduced funding for public meeting awareness, outreach and effectiveness
- Reduced ability to adequately communicate about important regulatory, safety or operational matters to internal and external audiences, which could expose BPA to additional risks
- Reduces funding for public outreach and engagement through sponsorships and community relations activities
- Reduces ability to purchase supplemental graphics services and materials, or targeted supplemental labor for specialized communications needs
- Reduces ability to fund equipment upgrades/purchases for new social media and other communications activities, video/media team
- Reduces opportunity for preservation of BPA/Northwest history and availability of resources for public use via our BPA Library and Visitor Center

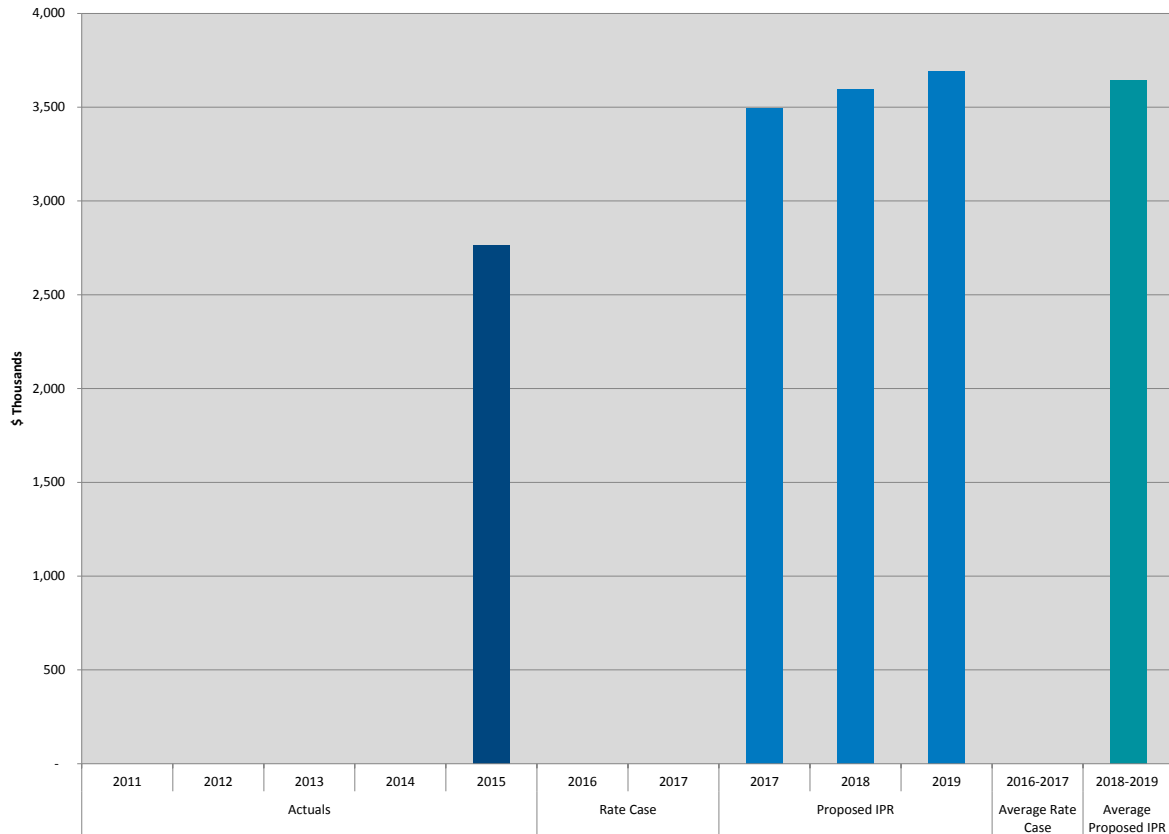
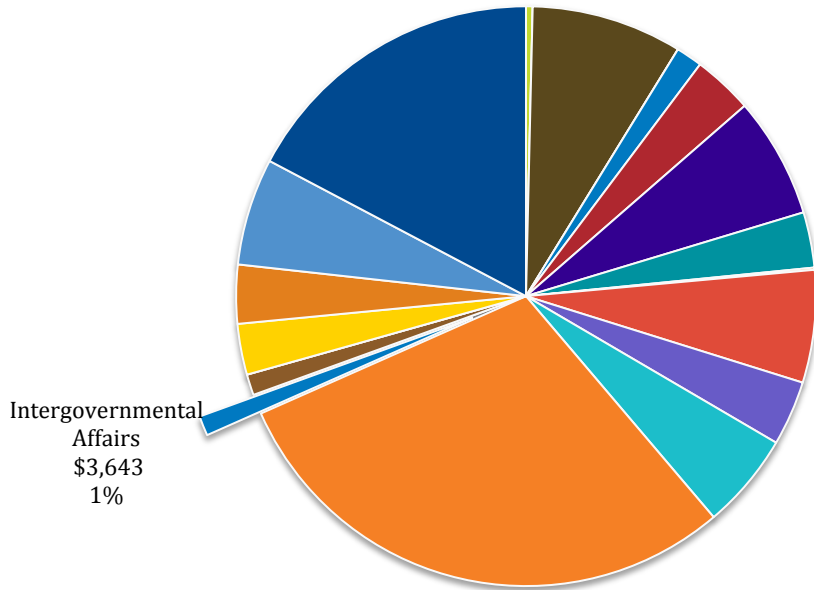
Challenges/Constraints

The current and near-term (FY 2016–19) challenges and constraints to the Communications mission are:

- Enhanced and new requirements for communicating around the topics of safety, regulatory compliance and cyber issues/physical security
- Continued evolution in the types of communications vehicles and frequency being driven by changing customer, audience and stakeholder expectations (e.g., social media, higher quality graphic and video content, internal and external communication on a wider array of topics)
- With wider topic and issue engagement, a higher demand for public engagement, public process and public meeting support (e.g., forums such as Focus 2028, financial/spending level forums)
- Columbia River Treaty and other special public process support
- The resumption of constituent coordination and outreach for revisions to the FCRPS BiOp, and;
- The schedule of needed transmission and generation system replacements, construction and upgrades

5.1.10 Intergovernmental Affairs

FY 2018-19 Average: Proposed IPR Costs



Program Details

(\$Thousands)	Actuals	Rate Case			Proposed IPR		
	2015	2016	2017	2017	2018	2019	
Agency Services G&A Allocations	2,763	0	0	3,494	3,594	3,693	
Grand Total	2,763	0	0	3,494	3,594	3,693	

In IPR 2014, Public Affairs included both Communications and Intergovernmental Affairs.

Description, Purpose and Responsibilities

Intergovernmental Affairs is responsible for developing and managing BPA's outreach and coordination with national, state, local and tribal government entities and elected officials. Intergovernmental Affairs also supports engagement with public interest organizations on BPA decisions and coordinates BPA's relationship with the NW Power and Conservation Council. This function is responsible for fostering support, knowledge and effective involvement in and awareness of BPA's activities, including the regional engagement required by section 2.3 of the 1980 Northwest Power Act.

Goals

Intergovernmental Affairs anticipates the interests and concerns of regional elected officials, government agencies and public interest organizations as BPA contemplates and evaluates perspectives related to current and future programs and policies. Intergovernmental Affairs seeks to provide adequate information in advance of BPA's policy and financial processes while ensuring that those with such interests find productive engagement with BPA's leadership and subject matter experts. The outcome of these efforts is better decision-making by BPA as well as more informed regional elected officials and constituents, with the expectation that the efforts result in efficient use of BPA's resources for implementation of its statutory responsibilities.

Near-term Goals

- Engaging regional elected officials, tribal governments and other constituent organizations in strategies for BPA's Long-term financial position and meeting statutory obligations.
- Supporting continued regional engagement for the Columbia River Treaty regional recommendation.
- Supporting local community and elected officials engagement for transmission infrastructure development such as the I-5 Corridor Reinforcement and modernizing aging transmission assets.
- Supporting preparation of the 2018 FCRPS Biological Opinion and associated compliance with the National Environmental Policy Act, including the extensive constituent involvement entailed.
- Supporting BPA initiatives to successfully engage in evolving western commercial operations through engagement with state and federal regulators, elected officials and interested constituent groups.
- Supporting BPA initiatives for improved system operations through solutions for transmission operations and planning; balancing, and reliability and appropriate capital investments.

- Monitoring and informing federal and state energy policies that impact the electric utility industry.

Intergovernmental Affairs works with tribes and local, state and federal governments, and other constituents, to promote a mutual understanding of the needs of the region and agency; and participates as a partner with agency leadership to develop effective federal, regional, tribal and constituent engagements that shape the agency's objectives and implementation strategies.

Long-term Goals

- Support regional processes for effective implementation of BPA's fish and wildlife mitigation obligations.
- Support operational decisions to anticipate and address transmission operational challenges.
- Support biannual program review and rate case processes.

Risks of Operating at Levels below the Proposed Spending Levels

The impact of operating below the proposed spending levels would have discernable impacts:

- Regional constituents would have reduced notice and opportunities for engagement in BPA-led program development and funding processes.
- Regional confidence in BPA's decision-making could erode; generating demand for debate and course changes following decisions and in multiple venues including Congress, the Federal Energy Regulatory Commission and the courts.
- Increased executive and subject matter expert time to respond to unanticipated concerns from state and federal governments; tribal governments and constituent groups.
- Foregone opportunities to collaborate with federal agencies, state and tribal governments for statutory obligations and technology advances at lower cost.
- Internal awareness of federal and state energy policies that impact the utility industry could decline.
- Limited ability to coordinate with regional interests on issues related to NW Power and Conservation Council could negatively affect regional perspectives toward BPA programs and policies.

Challenges/Constraints

The current and near-term (FY 2017–19) challenges and constraints to the Intergovernmental Affairs mission are:

- The degree of tribal, state and constituent coordination expected for the Columbia River Treaty.
- Northwest states interests in the design of evolving regional markets for electricity and associated services including a means of reliably integrating new renewable electricity resources.
- The resumption of constituent coordination and outreach for revisions to the FCRPS BiOp and the extensive regional engagement expectations for a new NEPA process for the BiOp.
- The schedule of needed transmission system replacements, construction and upgrades and the communities affected.
- Regional responses to federal environmental requirements such as the proposed EPA Clean Power Plan and other climate initiatives.

- BPA's Long-term financial stability and its ability to meet its statutory obligations at sustainable rates (Focus 2028).

5.2 Chief Administrative Office (CAO) Programs

Program Details

(\$Thousands)	Actuals	Rate Case			Proposed IPR		
	2015	2016	2017	2017	2018	2019	
Human Capital Management (HCM)	18,768	20,867	21,343	17,210	17,550	17,898	
Internal Operations	1,026	774	793	3,748	3,822	3,896	
Safety	3,971	3,628	3,697	9,115	9,291	9,473	
Security & Continuity of Operations (OSCO)	9,953	10,525	10,711	10,531	10,732	10,940	
Supply Chain	20,641	21,284	21,685	19,151	19,550	19,950	
Workplace Services	55,985	56,955	58,101	54,660	56,429	57,831	
Chief Administrative Office Total	110,344	114,033	116,330	114,415	117,373	119,988	

Description, Purpose and Responsibilities

Bonneville Power Administration (BPA) created the Chief Administrative Office in FY 2015 to ensure that internal business services are strategically aligned, communications are effective and the work is clearly prioritized and well executed. The creation of the Chief Administrative Office adds a fourth executive to the BPA Executive Office in the role of Chief Administrative Officer (CAO).

The CAO is responsible for providing policy and strategic guidance concerning BPA internal operations. This function provides leadership at the executive office level for strategic direction and policy for a high performing organization.

The CAO leads the Chief Administrative Office (N) which consists of Internal Operations, Diversity and Inclusion, and the five previous internal business services functions of Human Capital Management (HCM), Safety, Security and Continuity of Operations, Supply Chain Services, and Workplace Services.

The CAO enables BPA to achieve its mission through the following functions:

SAFETY

The Safety team provides advice, counsel, direction and support to all BPA federal employees to ensure a safe workplace; reviews and approves contractor site-specific safety plans in compliance with host utility responsibilities; is the point-of-contact with the DOE for the Federal Employee Occupational Safety and Health Program; conducts inspections, investigations and appraisals; and makes recommendations concerning safe work practices and procedures. The Safety Organization is responsible for the implementation of the Safety and Health KSI.

CAO Mission:

We are an integrated service organization enabling BPA to achieve its mission by acquiring, protecting, and maintaining assets.

CAO Vision:

We are a valued partner, recognized for excellence in providing services and assets critical to BPA's success.

HUMAN CAPITAL MANAGEMENT

HCM plans, directs and manages a comprehensive federal human capital management program. HCM has six major program areas: strategic integration, employee and labor relations, HR information management, staffing and classification, employee services, and learning and development. HCM develops, communicates and coordinates HR strategies, policies and initiatives with BPA business units and corporate organizations as outlined in the HCM workforce plan, in accordance with operational and strategic initiatives, and in compliance with all federal human resource policies. HCM is responsible for the implementation of the Workforce Strategy Key Strategic Initiative (KSI).

SECURITY AND CONTINUITY OF OPERATIONS

The Office of Security and Continuity of Operations implements the BPA-wide program for physical, personnel, information and infrastructure security; emergency management; and continuity of operations. This office, under the direction of the Chief Security and Continuity Officer (CSCO), provides BPA with effective and consistent security policy development, technical assistance, education and training, complex-wide independent oversight, and enforcement.

The CSCO addresses BPA-wide security issues to encourage collaboration and promote sharing of technical expertise; enhance the security and resiliency of BPA's critical energy infrastructure; and ensure BPA's ability to continue, or quickly recover from an event that causes operational impacts.

SUPPLY CHAIN SERVICES

Supply Chain is a full-service provider of procurement, materials management, logistics services and fleet. The group provides internal customers with a collaborative, seamless and timely method for obtaining equipment, materials and services. Supply Chain ensures the process is ethical and has risk-appropriate business practices that are compliant with internal controls. The organization monitors and manages all supply chain functions across BPA.

Supply Chain provides specialized services in support of internal BPA customers including: contracting for services, materials and equipment; managing materials, including warehousing of inventory, inventory management and order filling; handling transportation and fleet management, asset utilization and investment recovery; processing and disposal of hazardous materials; managing supplemental labor; and information systems management as it applies to supply chain, including management of material and equipment catalogs.

WORKPLACE SERVICES

Workplace Services supports overall BPA business operations by providing facilities and business services. Facilities includes the full life-cycle management (planning, acquisition, operations and disposal) of all facility assets, office space, critical back-up utilities for control and scheduling centers, and conference rooms. Business services provides printing support and products, mail services, office space and furniture management, commuter parking programs and office supplies.

INTERNAL OPERATIONS

The CAO Internal Operations team was established through a re-purposing of existing resources and funds to enable better efficiency, reduce redundancy, improve focus on high priority programs,

and improve strategic capabilities for the CAO. As the program matures, additional efficiencies are expected to be realized. This team is managed by the Deputy Chief Administrative Officer and will oversee, promote and strengthen BPA's internal management strategies and priorities. Specific responsibilities include:

- Manage BPA's Sustainability program including establishing a strategy and providing oversight of implementation plans across BPA.
- Establish long-term internal business strategies and plans in alignment with broader BPA operational priorities and goals.
- Formulate and implement high performing organizational objectives and integrate these objectives across BPA's business lines and into BPA's internal systems and work processes.
- Provide cross-organizational policy and strategic guidance about administrative services.
- Provide leadership at the executive level for strategic direction and policy.
- Implement cross-CAO programs and initiatives including strategic planning, operational excellence initiatives, IT strategy, compliance, employee engagement, streamlining common business functions, integrated workforce planning, strategic communications and change management, and integrated cost management.
- Implement cross-BPA initiatives and programs including project management of key strategic initiatives and management of executive committees.

DIVERSITY AND INCLUSION

The Diversity and Inclusion organization was also established through a re-purposing of existing resources and funds to better align efforts across the agency. As the program matures, additional efficiencies are expected to be realized. This organization drives success and innovation throughout BPA by recognizing and embracing the differences that give BPA a strategic business advantage. It collaboratively develops, communicates, and coordinates policies and initiatives that lead organizational change to foster a diverse workforce and an inclusive culture. This function conducts analytics, formulates solutions, and implements strategies while developing and maintaining strong relationships with internal and external stakeholders. Specific responsibilities include:

- Develops diversity and inclusion strategies and programs that are aligned with and support BPA's business goals, and that impact recruitment, retention, leadership development and employee engagement.
- Evaluate, develop and propose strategies surrounding analyzed data related to the diversity and inclusion program.
- Establish objectives, milestones, tracking mechanisms, and methods for monitoring and reporting in order to advance the diversity of our workforce and strengthen our inclusive work environment.
- Recommends targeted recruitment and outreach to address representation gaps, including sponsoring events that seek to address BPA's critical workforce needs by encouraging youth to engage in STEM, trades, and other fields where we need a strong future workforce.

Goals

Workforce Strategy KSI BPA's Workforce Strategy KSI seeks the following long-term outcome: BPA has a diverse workforce of the Right Size and Composition, with the Right Skills and Competencies, working in a Positive Work Environment to deliver on its public responsibilities and strategic priorities through a federally compliant HCM program in collaboration with the DOE.

Employee Safety and Health Strategy KSI BPA's Employee Safety & Health KSI seeks the following long-term outcome: a workplace where engaged employees and contractors are empowered to recognize job hazards and address safety and health issues. Safety and health are integrated into all aspects of work with a goal of zero injuries. To achieve this outcome, BPA will focus on implementing improvement initiatives in the following areas: safety culture, safety governance, safety by design, and aligning safety and health functions.

Sustainability Implement a long-term sustainability strategy that addresses reduction of greenhouse gas emissions from internal operations through energy management, water conservation, materials management, fossil fuel reduction and employee engagement. Improve and implement sustainability action plans across operational areas.

Continuity of Operations Program Effectiveness Improve BPA's continuity capability and program compliance through matured testing, training and exercise activities; broadened workforce awareness and preparedness; and a comprehensive BPA incident management plan.

Facilities Asset Strategy Implementation (KPI) Advance the facilities asset strategy through a series of focused initiatives.

Changes from the 2014 IPR

1. Established a CAO Cost Pool to enable effective cost management with clear accountability and authority for the CAO.
2. Established CAO Internal Operations through re-alignment of resources.
3. Established a Diversity and Inclusion Office through re-alignment of resources.
4. The Safety Organization has embarked on many improvements to our safety infrastructure and is leading efforts to develop a safety culture based on trust, quality and accountability.
5. The Occupational Health program has moved from HCM to Safety to address duplicative efforts and streamline processes.
6. BPA was selected as one of five Human Resources (HR) Service Centers within the DOE. BPA will service BPA employees and will participate with other service centers in HR process improvement efforts. DOE has established a ratio goal of one HR employee for every 45 employees serviced, and BPA's HR Service Center is projected to meet that ratio in support of the DOE-wide goal.

Risk and Impact of Operating at Cost Target

To achieve the cost targets proposed for FY2017–19 while implementing major initiatives such as the Safety and Health KSI, Workforce KSI, and address inflation, the Chief Administrative Office has worked to re-align resources including personnel and funds across the organization. This spending level allows the CAO to deliver on the core programs and services required for BPA to meet mission requirements, but does introduce the following risks:

- Reduced flexibility for addressing emergency and unplanned work.
- Over-spend if federal personnel burn rates are higher than past years.
- Deterioration of asset health.
- Reduced service levels for non-core business.
- Increased service delivery times.

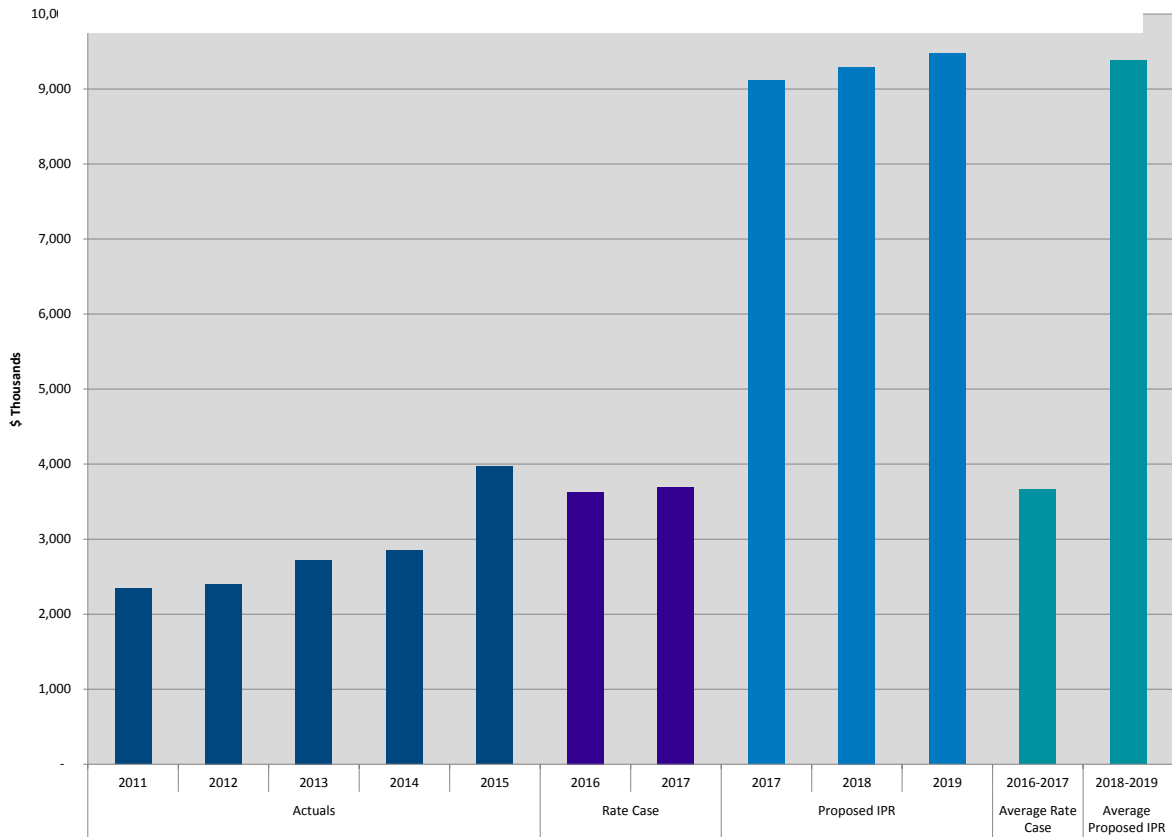
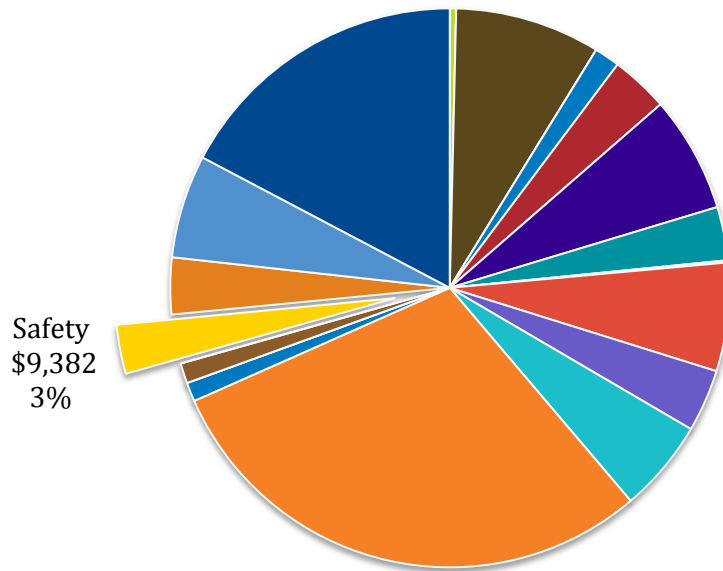
To meet current targets and ensure management of costs over time, the CAO will find efficiencies to offset inflation pressures by continuously seeking improvements across the Chief Administrative Office Portfolio. Additionally, the following strategies will continue to be used:

- Full Cost Management Cycle – From strategic planning to implementation through accountability, rigorous cost management and measurement of performance and progress towards program objectives.
- Balance of Short/Long-term needs and priorities – Emphasis on both current and long-term priorities with proposed spending levels that spread risk over time without significantly impacting performance of support functions. Also, discerning and clearly defining core business priorities from operational improvements and enhancements will be an essential to achieve balance.
- Cost Containment – Contribute to BPA's long-term financial sustainability by enforcing robust and rigorous cost management practices in the short-term through efficient automation of processes, continuous process improvement, operational excellence, work retirement and fiscal discipline.
- Talent Management – Through the Workforce Strategy KSI, HCM will actively manage workforce composition, attrition and effective position management.
- Technology – Leverage technology to improve efficiencies, compliance, and ensure reliability of critical business systems.
- Asset Management Strategy Execution – Prioritize and sequence investments across CAO portfolios that take into consideration potential trade-offs between physical assets and programs through a risk-informed strategy of deferral and consideration of alternatives.
- Business Case Justification – Enhance, adopt and enforce robust methods and frameworks for business case analysis, development and approval.

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5.2.1 Safety

FY 2018-19 Average: Proposed IPR Costs



Program Details

(\$Thousands)	Actuals	Rate Case		Proposed IPR		
	2015	2016	2017	2017	2018	2019
Agency Services G&A Allocations	3,965	3,628	3,697	9,115	9,291	9,473
Transmission Direct Support	6	0	0	0	0	0
Grand Total	3,971	3,628	3,697	9,115	9,291	9,473

Description, Purpose and Responsibilities

The Safety team provides advice, counsel, direction and support to all BPA federal employees to ensure a safe workplace; reviews and approves contractor site-specific safety plans in compliance with host utility responsibilities; is the point-of-contact with the DOE for the Federal Employee Occupational Safety and Health Program; conducts inspections, investigations and appraisals; and makes recommendations concerning safe work practices and procedures. The Safety Organization is responsible for the implementation of the Safety and Health KSI.

Goals

Engage executives, agency leaders, and BPA workforce to build a strong safety culture across BPA. Implement a robust safety and health system by collecting industrial exposure data and monitoring industry improvements in the safety discipline. Ensure compliance with the Federal Employee Occupational Safety and Health (FEOSH) Program by reviewing and updating programs and procedures.

Changes from the 2014 IPR

Safety is now recognized as an agency core value. BPA stood up additional safety committees to include the Executive Safety Committee, Office Occupational Safety & Health Committee, Safety Steering Team, and the Contractor Safety Committee. The Safety Organization has been restructured to comprise of three Directors who are responsible for day-to-day operational management and decision making. In July 2015, the Medical Surveillance team joined the Safety Organization allowing BPA the ability to stand up a comprehensive safety and health program. The Safety Leadership for Field Professionals course was initiated in September 2015 with multiple cohorts being offered throughout 2016 and planned for 2017–19. Safety leadership training for non-field managers and supervisors is planned for 2017–19.

Risks of Operating at Levels below the Proposed Spending Levels

The Safety Organization faces unique challenges. The integration of safety as a core value and the development of a strong safety culture require safety programs and training that are compliant with regulatory agencies and consistent with best practices. Operating below proposed spending compromises safety by limiting or deferring key strategic initiatives needed to lead the agency on the safety journey towards best-in-class. Failure to address resource needs, to update policies,

programs and standard operating procedures creates the risk of a workplace environment that is not conducive to a strong safety culture, employee satisfaction, recruitment, and operational excellence.

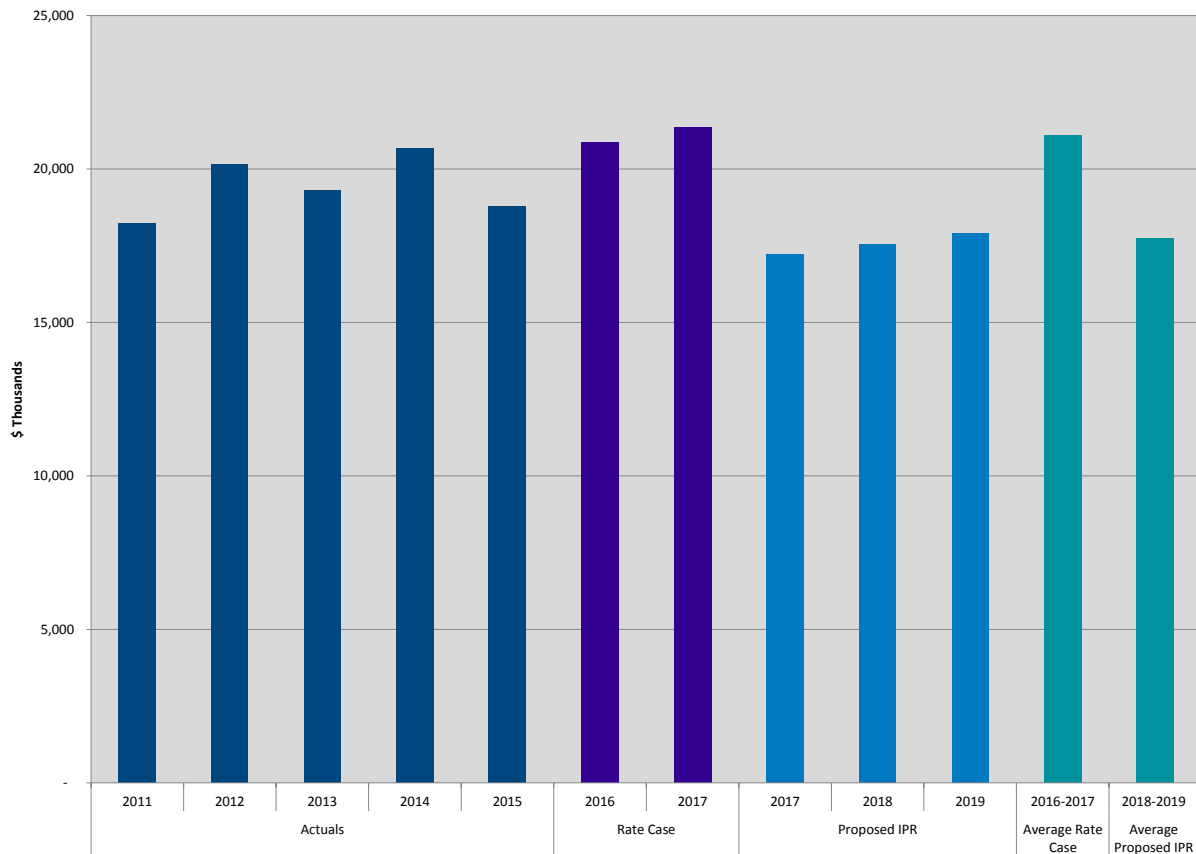
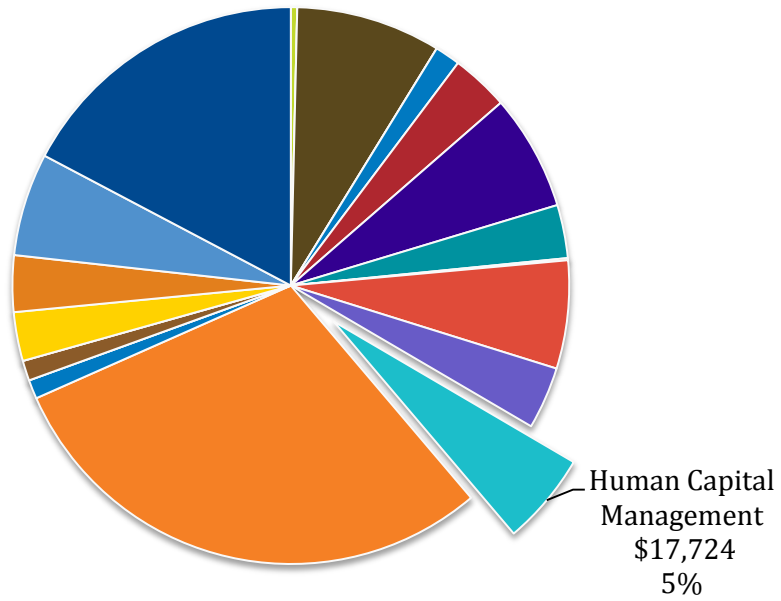
Short-term, Mid-term, and Long-term Firm and Flexible costs

- **Short-term flexible** The Safety Organization has very little in terms of short-term flexibility in its costs that do not currently have a contracted commitment in place. Most commitments in place include projects aimed at hazards that pose the highest related risk to the BPA workforce and OSHA required training.
- **Mid-term flexible** Mid-term flexible expenses are based on items that currently have a contract in place or are necessary to maintain current key initiatives/activities. Costs include travel by safety managers throughout their districts to perform inspections, facility audits, and address safety hazards across BPA. BPA leadership has identified Safety Leadership as a prioritized and key strategic initiative throughout 2019.
- **Long-term fixed** Long-term fixed expenses are considered necessary to maintain the growth of the Safety Organization, the maturation of the safety programs, or are required by Federal Occupational Safety and Health (FEOSH) Program and Federal OSHA. These obligations include full time federal employees, Occupational Health program and regulatory safety and health exposure monitoring (e.g., Lead, Hearing)

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5.2.2 Human Capital Management (HCM)

FY 2018-19 Average: Proposed IPR Costs



Program Details

(\$Thousands)	Actuals	Rate Case		Proposed IPR		
	2015	2016	2017	2017	2018	2019
Agency Services G&A Allocations	15,725	17,462	17,883	14,010	14,350	14,698
Transmission Direct Support	3,044	3,405	3,460	3,200	3,200	3,200
Grand Total	18,768	20,867	21,343	17,210	17,550	17,898

Description, Purpose and Responsibilities

HCM plans, directs and manages a comprehensive federal human capital management program. HCM has five major program areas: strategic integration, employee and labor relations, HR information management, staffing and classification, and learning and development. HCM develops, communicates and coordinates HR strategies, policies and initiatives with BPA business units and corporate organizations as outlined in the HCM workforce plan, in accordance with operational and strategic initiatives, and in compliance with all federal human resource policies. HCM is responsible for the implementation of the Workforce Strategy Key Strategic Initiative.

Goals

BPA's Talent Management Strategy identifies three strategic objectives for BPA's workforce to achieve established business outcomes. These objectives are to have a workforce that 1) is the right size and composition, 2) possesses the right skills and competencies and 3) works in a positive environment. BPA incorporated these into the Workforce Strategy key strategic initiative and the critical focus for FY 2017 is accessing talent, total workforce planning and management, and compensation.

Changes from the 2014 IPR

HCM has regained its hiring authority since 2014 and significant effort was placed in filling the numerous vacant positions. HCM has established a solid foundation from which model HR organizations are built and successfully executed on retraining, development and oversight initiatives for operational improvement. HCM achieved position strength of 94 percent, time to hire was reduced to 120 days and baseline metrics were established for measuring candidate experience. HCM created a succession planning framework based on efforts to improve bench strength. The CAO created a Diversity and Inclusion Office and designated resources to drive success and innovation throughout BPA.

Risks of Operating at Levels below the Proposed Spending Levels

HCM's ability to fill critical positions and develop current staff is at risk with lower cost targets. Understaffed positions put pressure on an already strained workforce caused delays in hiring. Retirements of our most experienced staff add to this strain. Our remaining staff includes many new leaders that require mentoring and development. A delay in these supervisory programs

would limit the needed growth of leaders to manage the business teams required to deliver on BPA's mission.

Short-term, Mid-term, and Long-term Firm and Flexible costs

Tradeoff options for HCM include the use of other hiring flexibilities such as TERMS, temporary appointments and volunteers to decrease longer-term costs of permanent Federal employees. Another tradeoff option is to fill specified positions with BFTE as opposed to CFTE when there is a Long-term need resulting in decreased costs.

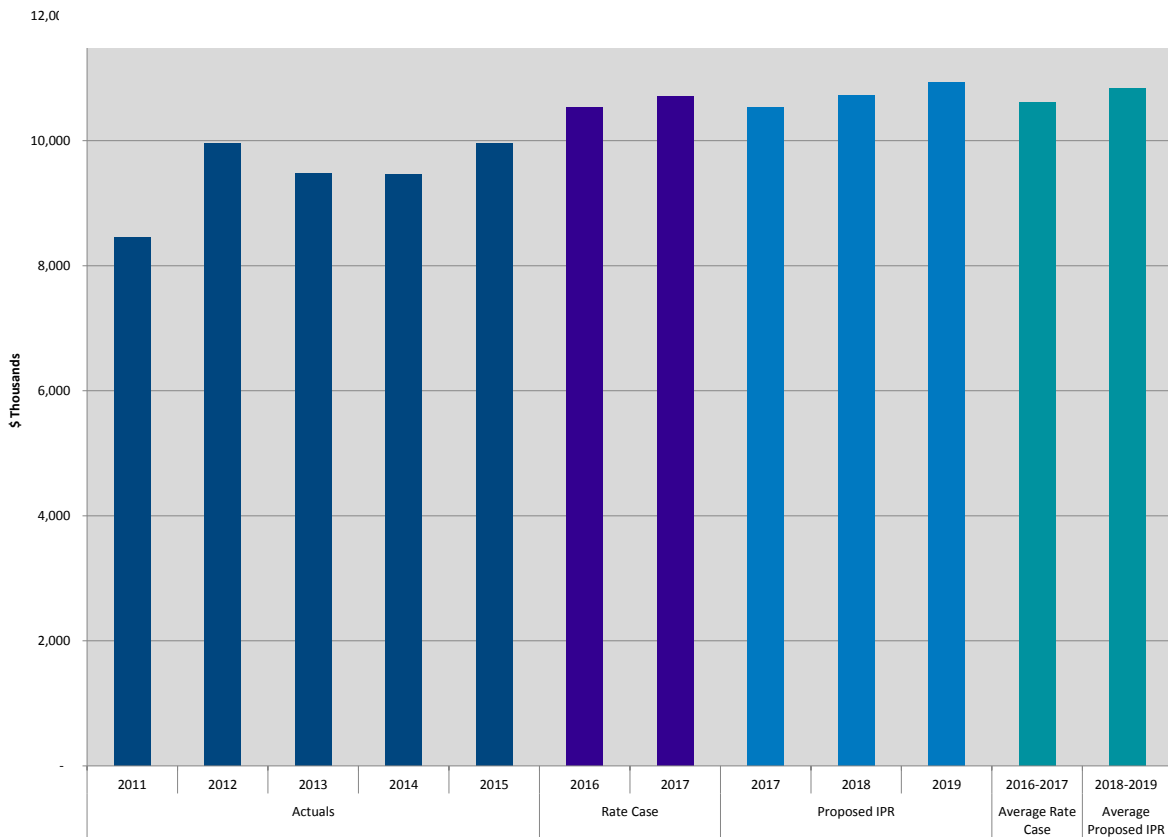
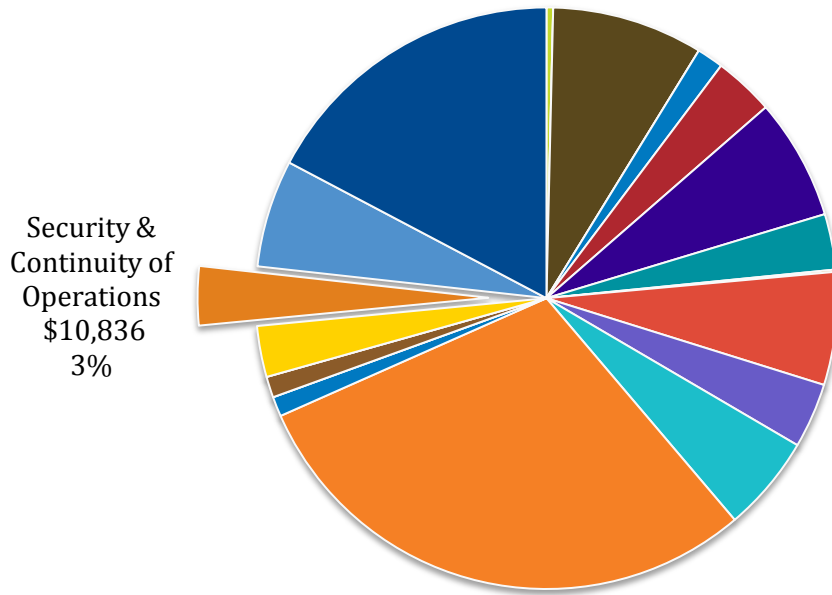
Short to Mid-term flexible costs include training related programs (e.g. Leadership Development, Presentation Skills, etc.) and Employee benefit programs (e.g. Be Well).

The majority of HCM spending level is for personnel compensation and benefits and is considered long-term fixed costs. The operations and maintenance of HCM IT systems are also considered long-term costs.

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5.2.3 Security and Continuity of Operations (OSCO)

FY 2018-19 Average: Proposed IPR Costs



Program Details

(\$Thousands)	Actuals	Rate Case		Proposed IPR		
	2015	2016	2017	2017	2018	2019
Agency Services G&A Allocations	9,266	9,845	10,070	9,901	10,088	10,283
Transmission Direct Support	687	680	641	630	643	657
Grand Total	9,953	10,525	10,711	10,531	10,732	10,940

Description Purpose and Responsibilities

The Office of Security and Continuity of Operations implements the BPA-wide program for physical, personnel, information and infrastructure security; emergency management; and continuity of operations. This office, under the direction of the Chief Security and Continuity Officer (CSCO), provides BPA with effective and consistent security policy development, technical assistance, education and training, complex-wide independent oversight, and enforcement.

The CSCO addresses BPA-wide security issues to encourage collaboration and promote sharing of technical expertise; enhance the security and resiliency of BPA's critical energy infrastructure; and ensure BPA's ability to continue, or quickly recover from an event that causes operational impacts.

Goals

OSCO's objectives are protection, life-safety, disaster preparedness and compliance. These goals are directly tied to the BPA priorities of our people and physical assets. The organization works to implement a comprehensive approach to ensure personnel and critical infrastructure are protected in both the office environment and in the field. Continuity of operations is an important focus area and OSCO develops and executes BPA-wide continuity training and exercise programs for staff.

Changes from the 2014 IPR

Since the 2014 IPR, Physical Security Program has completed NERC CIP Version 5 transition projects and the continued development of strategies to meet DOE's Graded Security Protection (GSP) Policy requirements. These efforts, as well as NERC CIP 014 have resulted in an overall increase in programmatic workload. Moreover, the Personnel and Information Security group (PERSEC/INFOSEC) has been assigned additional mandatory compliance requirements from the Office of Personnel Management and NERC via the Critical Infrastructure Protection Standards (CIP). BPA Continuity of Operations continues to identify new needs that ensure the Agency can continue to perform its primary Mission Essential Functions in the event of a catastrophic or disruptive event.

Risks of Operating at Levels below the Proposed Spending Levels

NERC CIP 014 adds to BPA's Physical Security baseline workload. Once CIP 014 basic requirements are complete, sustainment of those CIP 014 requirements must continue. Operating at levels below the proposed spending levels will require re-prioritization, curtailment and delay compliance initiatives. Impacts may include a decline in general security awareness, slower response to physical security incidents and delayed maintenance and replacement of physical security equipment and infrastructure.

Short-term, Mid-term, and Long-term Firm and Flexible costs

Short-term flexible The BPA Continuity Program's training and training-related travel spending level can be classified as short-term flexible.

Mid-term flexible Security technology refresh of existing security infrastructure at BPA facilities (e.g. cameras, motion sensors, etc.) and a Security Access (ProWatch) Modernization effort are considered mid-term flexible.

Long-term fixed Travel in support of NERC CIP Physical Security regulatory requirements is considered a long-term obligation. In Personnel Security, investigations for logical and physical access to government facilities and information systems and NERC CIP compliance requirements are also long-term obligations.

Information Security requires ongoing support of DOE requirements to train security staff in handling classified information as well as support of NERC CIP compliance requirements for Bulk Electric System & Cyber System Information. The Continuity Program has long-term fixed costs related to the maintenance of existing capabilities and on-going improvement, both of which are requirements under FCD and DOE Order 151.1.

5.2.4 Security and Continuity of Operations (OSCO) — Capital

Program Details

(\$Thousands)	Actuals	Rate Case		Proposed CIR			FY 17- 19 Total
	2015	2016	2017	2017	2018	2019	
Asset Category Direct Spending							
Security	1,447	6,383	7,570	8,000	6,000	8,000	22,000
Grand Total	1,447	6,383	7,570	8,000	6,000	8,000	22,000

(\$Thousands)	Remaining CIR						
	2020	2021	2022	2023	2024	2025	2026
Asset Category Direct Spending							
Security	7,000	7,000	7,000	7,000	5,418	5,527	5,635
Grand Total	7,000	7,000	7,000	7,000	5,418	5,527	5,635

Profile of Assets

The purpose of security assets is to implement BPA requirements for protection and compliance. BPA defines *security assets* as material, equipment, software or hardware that is used for the primary purpose of providing protection. Individual assets or components make up security systems that collectively provide various levels of physical security protection depending on the asset being protected. Table “A” outlines the systems, their purpose, and provides examples of the types of components included in each system.

Objectives

OSCO’s strategic goals of *security and compliance* will be achieved by meeting the following strategic objectives:

- Identify, prioritize and close security gaps in protection standards set by BPA’s Critical Asset Security Plan (CASP).
- Research, develop, scope and implement a technology refresh of aging security infrastructure in the near term.
- Forecast, prioritize and fund system maintenance activities which are economical, sustainable, risk informed and ensure reliable system performance.

<i>System or Function</i>	<i>Purpose</i>	<i>Asset Types Included</i>
Protective Barrier	Provide a physical barrier between adversary and target. Protective barriers delay an adversary’s attempts to gain entry or cause damage to critical components.	<ul style="list-style-type: none"> • Fence • Gate • Padlock • Barbed wire • Bullet resistant glass • Window protection • Vehicle Barriers
	Video systems support assessment	<ul style="list-style-type: none"> • Fixed/PTZ cameras

Surveillance	of alarms and allow for review of incidents within the field of view of the various cameras.	<ul style="list-style-type: none"> • DVR/NVR • Hardware, wiring, and circuitry • Thermal imaging devices
Intrusion Detection	Provides warning of pending intrusion and notification of an intrusion. Provides depth to regulatory driven security systems that support NERC CIP compliance. Intrusion detection supports faster and more effective law enforcement response.	<ul style="list-style-type: none"> • Motion detectors • All “access control” components • Fence detection systems • Motion sensing cameras • Motion activated lights

Figure 5.3.4.1 - Systems and Component Overview

Strategic Challenges

Rapidly evolving regulatory requirements NERC CIP 014 is accepted as the latest NERC requirement to implement increased security at critical locations within BPA’s footprint. The Security Asset Management Strategy is crafted to respond to and implement the NERC CIP 014 security enhancement requirement.

Aging and technologically obsolete systems Large numbers of systems (primarily cameras) are projected to become vulnerable to attack in the coming years. If not managed, this will jeopardize the security system effectiveness.

Results to be Achieved

Compliance Success in maintaining security compliance will be measured by BPA having zero non-self reported violations of NERC requirements.

Protection By the end of 2017 four Tier 2 critical substations will have security enhancements installed, which will result in a notable reduction in risk.

Spending Levels

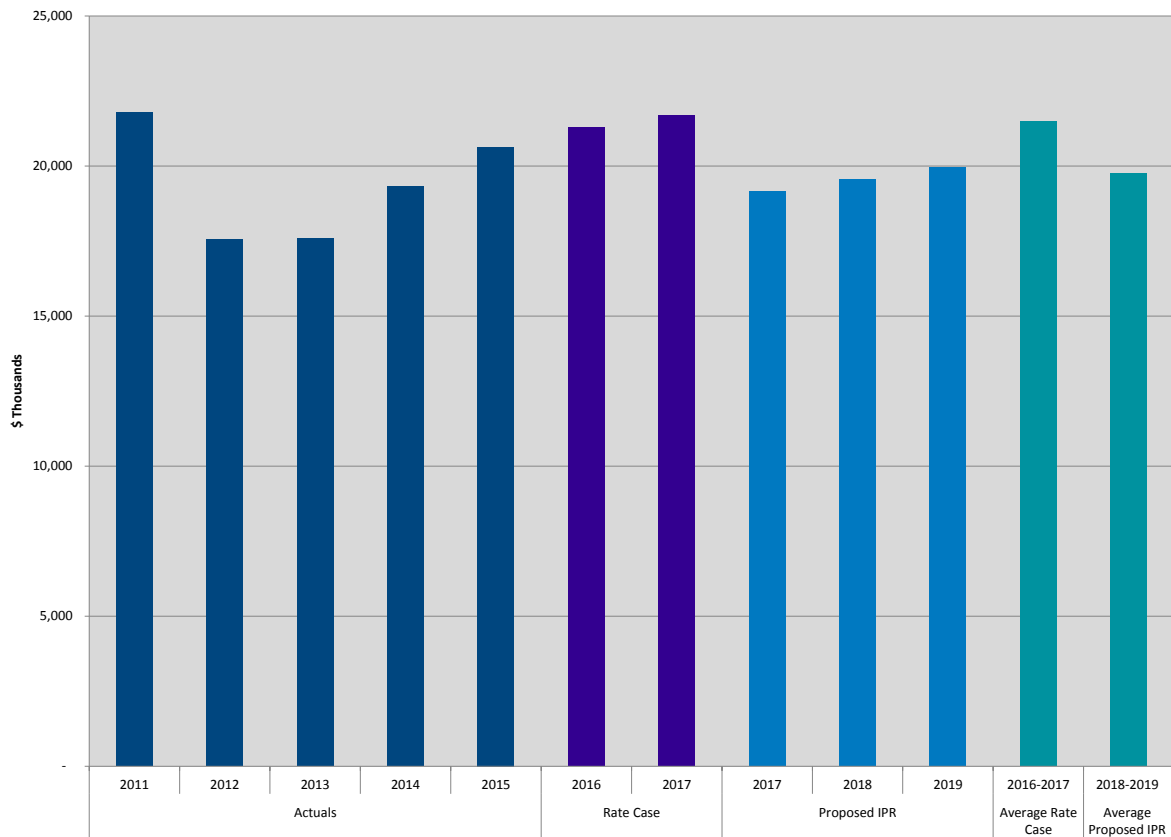
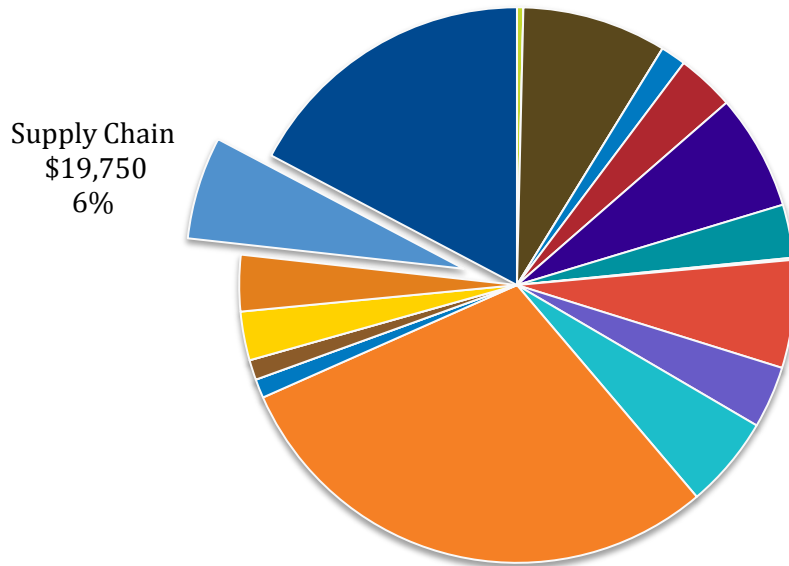
BPA’s OSCO is proposing a capital model which funds:

- Immediate Threat Mitigation providing agility and contingency in the event of the need for capital expenditures in response to proximate threats posed to BPA.
- NERC CIP v5 required protection funding at \$500,000 for FY 2017
- Graded security and critical infrastructure protection at Tier 1, 2, 3 and 4 sites

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5.2.5 Supply Chain

FY 2018-19 Average: Proposed IPR Costs



Program Details

(\$Thousands)	Actuals	Rate Case		Proposed IPR		
	2015	2016	2017	2017	2018	2019
Agency Services G&A Allocations	5,858	5,940	6,108	4,291	4,426	4,437
Transmission Direct Support	14,783	15,344	15,577	14,861	15,124	15,514
Grand Total	20,641	21,284	21,685	19,151	19,550	19,950

Description, Purpose and Responsibilities:

Supply Chain Services is the enterprise provider of procurement services, materials management, logistics services, supplemental labor, and fleet services. The group develops and executes strategies which provide internal business partners with managed solutions to secure equipment, materials and services. Supply Chain ensures these solutions meet policy, ethics, risk, and compliance requirements through collaboration with business partners across BPA. Supply Chain Services delivers value through cost effective, safe, efficient, and effective solutions that meet BPA mission requirements.

Specifically, Supply Chain Services provides: contracting for services, materials and equipment; managing materials, including warehousing of inventory, inventory management and order filling; handling transportation and fleet management, asset utilization and investment recovery; personal property management, P-Card administration, processing and disposal of hazardous materials; managing supplemental labor; and information systems management as it applies to Supply Chain Services, including management of material and equipment catalogs.

Goals

Supply Chain Services (SCS) will focus on delivering on Operational Excellence principles to all aspects of the services provided. Long-term goals include:

- Ensuring compliant operations through appropriate risk management.
- Supporting our customers (BPA lines of business) through better alignment and integrated planning.
- Expense and Capital optimization through strategic sourcing and operational excellence.
- Resource Management
 - People – increasing capability, right size, right skills alignment with the business lines
 - Process – efficient and effective
 - Technology – increase quality of throughput with automation, information management, metrics, strategic sourcing and controls
 - Policy – effective stewardship and compliance

Changes from the 2014 IPR

The consolidated Fleet Management organization went live with Fleetworx, a fleet management system that will provide detailed fleet asset data and allow for effective maintenance planning of the BPA fleet. The increased volume of work associated with Transmission construction projects is resulting in increased usage of fleet equipment during a time when workplace attrition has decreased the availability of uniquely skilled workers. The optimizing of the procurement organization, warehouse operations and the Supplemental Labor Management Office (SLMO) will gain efficiency for customers, reduce costs and increase compliance.

Risks of Operating at Levels below the Proposed Spending Levels

Operating at levels below the proposed spending levels will likely increase risk of equipment failures in the field, risk of non-compliant work output, delays in major overhaul services to fleet, maintenance costs to support outdated systems that can potentially result in safety incidents or a service reliability interruption. Maintenance and service requirements have increased and fleet capacity to keep equipment safe, in service, and provide new tools is strained with lower cost targets. Increase in workload associated with compliance audit findings in the SLMO will likely continue to strain the organization. Failure to improve pick/pack/store/retrieve warehouse operations can put operations at risk. An increase in workload demand from Transmission construction projects, Energy Efficiency projects, EF&W programs, and IT projects under current proposed spending levels is likely to result in missed project timelines and milestones. In addition, costs may increase as other resources are waiting for contract, materials or fleet equipment to be produced, transported or repaired.

Short-term, Mid-term, and Long-term Firm and Flexible costs

Short-term flexible – Implementing a more robust planning process for contract resource allocation and utilizing standardized specifications for all materials and services procured will help BPA save costs in the short-term. Restructuring processes by consolidating inventory management in the logistics organization and educating customers will lead to reduced inventory costs.

Mid-term flexible – Implementation of automated contract management system could help SCS gain efficiencies, reduce procurement costs and increase compliance.

Long-term fixed – Utilization of Fleetworx and the vehicle allocation methodology will help to right size the fleet and save costs long term.

5.2.6 Fleet — Capital

Program Details

(\$Thousands)	Actuals	Rate Case		Proposed CIR			FY 17- 19 Total
	2015	2016	2017	2017	2018	2019	
Asset Category Direct Spending							
Fleet	2,193	7,002	7,800	6,200	6,700	7,200	20,100
Grand Total	2,193	7,002	7,800	6,200	6,700	7,200	20,100

(\$Thousands)	Remaining CIR						
	2020	2021	2022	2023	2024	2025	2026
Asset Category Direct Spending							
Fleet	7,500	8,000	8,200	8,500	9,200	9,500	9,500
Grand Total	7,500	8,000	8,200	8,500	9,200	9,500	9,500

Profile of assets

BPA's mobile equipment fleet is comprised of approximately 2200 assets ranging from light to heavy duty vehicles, construction, mobile and material handling equipment. These assets are owned by BPA or leased by BPA from GSA. The net value of these owned assets is approximately \$80 million.

Objectives of this strategy

The objective of the Fleet Asset Management Strategy is to enable the Fleet Management Department (FMD) to provide effective and efficient services to all its internal customers by: 1) developing a vehicle replacement cycle with a 15 year procurement plan, 2) right-sizing the fleet through a systematic analysis in conjunction with reducing fossil fuel, 3) establishing policy on the types of equipment that should be agency-owned versus locally rented, 4) focus on preventive and predictive maintenance, 5) fostering business driven decisions using analytics and metrics, measured against risk and other operational improvement initiatives.

Strategic challenges

The risks that impact the implementation of the Fleet Asset Management Strategy center around BPA's aging fleet, increased operational timelines and maintenance costs realized, antiquated facilities and tools, limited access to short-term rentals and long-term leases or purchases, inconsistency of vehicle maintenance and process standardization, lack of adequate staffing, limited funding allocated for procurement plan, right-sizing issues and the ability to meet Government mandates of Green House Gas (GHG) emission and fossil fuel reductions.

Results to be achieved

With this large inventory, FMD will work towards right-sizing its fleet and optimizing the lifecycle of the various vehicles and equipment to ensure proper fleet management responsibilities. Replacing vehicles at the optimal time, planning proper maintenance, reducing downtime and unplanned repairs, disposing of assets that are under-utilized, reducing annual rental rates and ensuring proper fiscal management are paramount to providing effective Fleet management. Additionally, FMD will continue to work closely with its customers to understand their needs and assure effective, timely communication and service.

In regards to capital replacement, recent FMD efforts are keenly focused on updating BPA’s fleet to approach utility industry standards which have evaluated lifecycles and costs. Through these efforts, combined with the introduction of a fleet-wide life cycle analysis capability, the FMD foresees a reduction in annual capital expenditures for vehicle replacement. The projected end results are the stabilization of expenditures and replacements, in concert with an evenly distributed replacement program for the long-term.

These numbers will account for the sizeable costs of up-fitting both the line patrol and mobile technician vehicles that were previously charged to the Transmission Field District expense spending levels with vast variances in dollars and capability between locations. The efforts of the FMD have reduced overall agency wide fleet costs by approximately \$15,000 per vehicle for the initial upfit (savings of approximately \$750,000–\$1 million) and we expect to see a savings of \$35,000 for up to two subsequent replacement upfits per vehicle, an estimated savings of \$3.5 million. These savings are directly associated with standardizing costs, ensuring multiple uses of the equipment being installed and managing the installation process.

Spending levels

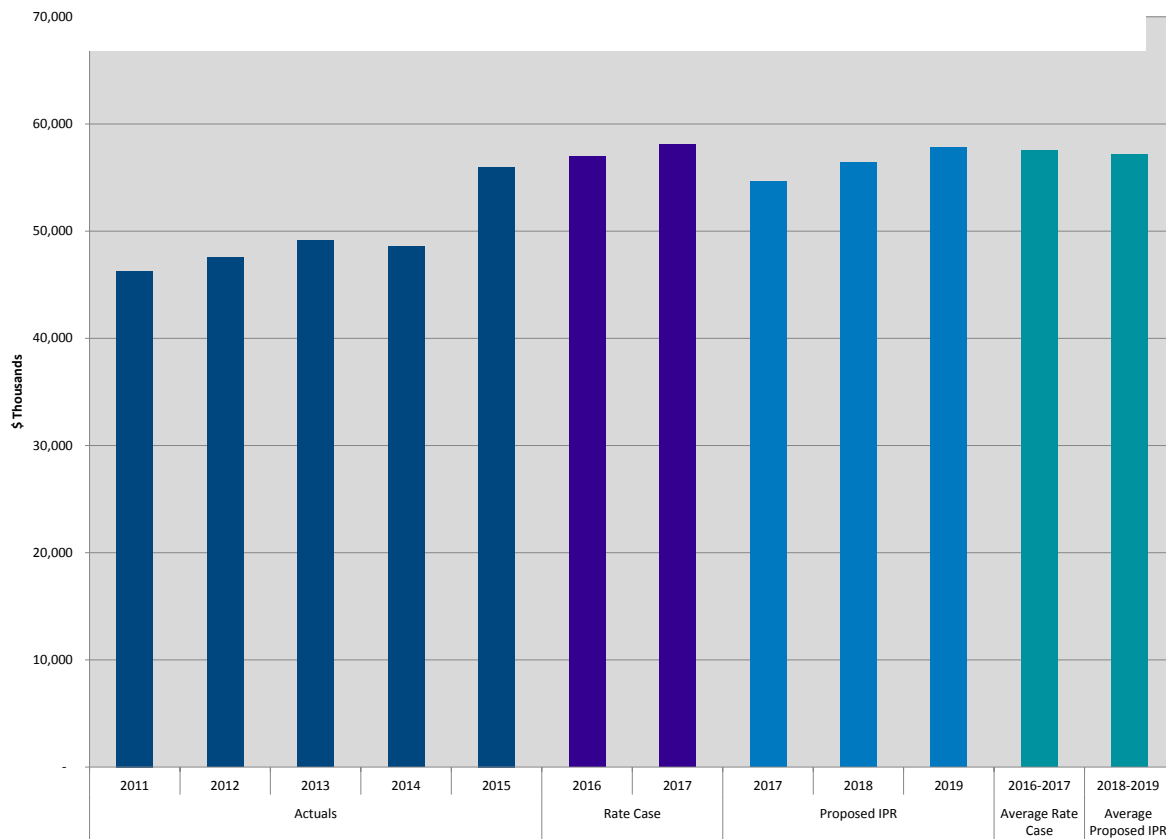
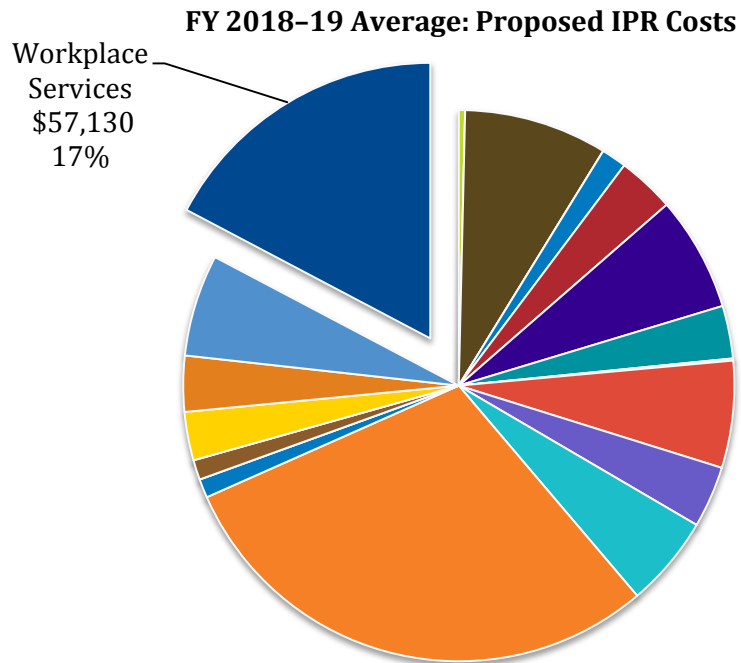
Currently, the annual operations and maintenance expenses for owned assets are spending leveled at \$10.5 million (\$3.5 M Operations/Support and \$7.0M Maintenance). Recently, annual capital replacements of BPA owned assets have averaged \$5.5 - \$7 million. GSA lease expenses add an additional \$6.5 million.

(\$ Millions)	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030
Capital Funds	6	7	7	8	8	8	9	9	9	10	10	10	10	10
Number of Units	55	46	55	43	57	60	55	55	55	55	55	55	55	55

The fleet replacement forecast, and associated capital cost estimates, are based upon actual costs to replace aerial and boom equipment prior to the third major overhaul (D-Service). Other equipment replacements are based upon estimated end-of-life decisions determined by age and obsolescence. As the centralized FMD matures and proceeds with the implementation of new vehicle and maintenance standard processes, a more comprehensive, transparent and robust vehicle replacement/acquisition plan will emerge.

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5.2.7 Workplace Services



Program Details

(\$Thousands)	Actuals	Rate Case			Proposed IPR		
	2015	2016	2017	2017	2018	2019	
Agency Services G&A Allocations	31,084	33,295	33,872	30,155	30,434	32,776	
Transmission Direct Support	24,901	23,660	24,229	24,505	25,995	25,054	
Grand Total	55,985	56,955	58,101	54,660	56,429	57,831	

Description, Purpose, and Responsibilities

Workplace Services supports overall BPA business operations by providing facilities and business services. Facilities includes the full life-cycle management (planning, acquisition, operations and disposal) of all facility assets, office space, critical back-up utilities for control and scheduling centers, and conference rooms. Business services provides printing support and products, mail services, office space and furniture management, commuter parking programs and office supplies.

Goals

Workplace Services mission is to enable all BPA operations by providing quality business services, safe and professional work spaces and facilities that allow BPA to conduct continuous operations. The organization will continue to develop and support emergency and alternate facilities requirements that enable continuity of critical business functions and systems. Another focus area is to streamline the space management program to increase flexibility and efficiency in space use and staff movement. Workplace Services is to continually provide process improvements to identify and eliminate non-value added activities and to implement cost-effective practices and facility improvements to reduce utility consumption.

Changes from the 2014 IPR

Since 2014, Workplace Services has implemented new design processes on major facility projects that have resulted in higher quality designs and reduced rework, delays, and operations and maintenance difficulties. A more intense scrutiny on utility consumption and execution of energy and water efficiency projects has led to lower facilities utility and operational costs. The organization has placed a more intense scrutiny on our procurement methods to ensure that we are using the most efficient contracting means.

Risks of Operating at Levels below the Proposed Spending Levels

The majority of the facility portfolio (60 percent) is more than 30 years old and in need of elevated levels of repair or, in many instances, replacement. The identified backlog of maintenance and repairs (BMAR) is over \$240M and will continue to be at risk by operating at levels below proposed spending levels. A high portfolio Facility Condition Index (FCI) represents an increased risk to grid reliability and personnel safety. Furthermore, facility degradation is a risk to the loss of expected operational and economic benefits due to premature failure and increased maintenance expenses.

Short-term flexible - Short-term reductions include revisions to programs such as parking, print plant, furniture replacement, grounds keeping, janitorial services and in facilities operations and maintenance activities.

Mid-term flexible - Mid-term flexible cost reductions include facilities planning and execution activities within a 1-2 years timeframe. Deferring these projects is possible, but it would require time to get these programs sequenced again.

Long-term fixed - Long-term flexible costs can be reduced by decreasing square footage required to house BPA resources and people. For office space, this would mean decreasing floor space square feet per person. Long-term fixed costs include leases required to meet BPA's current workplace needs.

5.2.8 Facilities — Capital

Program Details

(\$Thousands)	Actuals	Rate Case		Proposed CIR			FY 17- 19 Total
	2015	2016	2017	2017	2018	2019	
Asset Category Direct Spending							
Facilities	12,708	38,876	17,005	21,900	17,900	35,000	74,800
Grand Total	12,708	38,876	17,005	21,900	17,900	35,000	74,800

(\$Thousands)	Remaining CIR						
	2020	2021	2022	2023	2024	2025	2026
Asset Category Direct Spending							
Facilities	25,005	25,005	25,005	25,005	26,300	26,900	27,400
Grand Total	25,005	25,005	25,005	25,005	26,300	26,900	27,400

Profile of assets

BPA owns and operates an estimated 2.7 million square feet of building facility assets across Oregon, Washington, Idaho, Montana, and California. This includes over 1,000 buildings and structures at more than 400 sites that include critical infrastructure, such as our control centers, data centers and the Celilo DC Converter Station as well as control houses, maintenance shops, administrative offices and warehouses. These assets play a major role in the operation and maintenance of the Pacific Northwest transmission system.

Objectives of this Strategy

The FY 2017-30 Facilities Asset Management Strategy seeks to enable all BPA operations by providing quality support services and full life cycle management of BPA facilities assets in accordance with BPA Strategic Priorities. The scope of asset management activities includes replacements, renovation, system replacement and disposal of assets. Excluded are investments defined as expansion (including new facilities and additions to existing Transmission control houses, covered). Areas of focus:

- **Prioritized Asset Optimization** – Manage facilities assets and prioritize work through disciplined and coordinated processes that optimize mission criticality, risk, resources, return on investment, and sustainability while maintaining agility to meet new requirements.
- **Operation Alignment** – Comprehensively integrate Facilities initiatives and projects with other asset categories to the extent practicable.
- **Asset Life Cycle Management** – Manage facility assets with a life cycle perspective and improve facilities and processes through a continuous Plan-Do-Check-Act cycle.

Strategic Challenges

Internal and external factors may impact BPA's ability to achieve the AMS strategic objectives and include: 1) Backlogs of facilities maintenance and replacement, 2) Facilities planning and maintenance management systems (CMMS), 3) Access to project execution resources (procure, design, construct), 4) Non-centralized Facilities O&M program (Corporate and Transmission) and 5) Evolving regulatory requirements (OSHA, NFPA, building codes, NERC CIP).

Results to be Achieved

This focused strategy will inform BPA on asset health, as well as their level of performance, both in terms of meeting customers' needs and economic targets while identifying areas of the asset management systems that may be improved to ensure:

- Investments are prioritized based on risk and criticality in order to meet mission requirements and strategic intent. (See Criticality Charts below)
- Facility projects can be delivered within scope, schedule and spending level.
- O&M costs are optimized and returns on investments are predictable and fully realized.
- Performance and service standards for all facility assets are achievable and met.
- Assets are managed to maintain compliance, reliability and safety.

Facilities are grouped according to mission criticality as follows: Primary Mission Essential Functions or Category 1 assets, Mission Essential Functions (MEF) or Category 2 and 3 assets, and Essential Support Activities (ESA) or Category 4 and 5 assets. Figure 5.3.8.2 lists the asset and its priority level.

Spending Levels

Out year spending levels may be updated based on specific projects that are approved but the CIR funding proposal in total will not change.

ASSET CRITICALITY – GROUPED BY FACILITY PRIORITY

ASSET CRITICALITY – BY FACILITY PRIORITY			
PRIORITY LEVEL	ASSET GROUPING	ASSET TYPE	
1	UTILITY 1 (Critical Facility)	Dittmer Control Center Munro Control Center	DC Converter Station HQ & Ross Data Centers
2	UTILITY 2	Control House Control/Maintenance Relay House	Microwave/Radio Bldgs. Engine Generator Bldgs.
3	OFFICE, MAINTENANCE & SPECIAL	Office – Mission Critical Maintenance HQ Maintenance Shop	Meter Houses Storage – HazMat Storage – Special
4	STORAGE	Office – Mission Support Training & Research Pump House	Storage – Vehicle Storage – Site Utilities Storage - General
5	OTHER	Untanking Tower Oil House Lease	Abandoned Other

Figure 5.3.8.1

BPA FACILITIES PORTFOLIO BY AREA

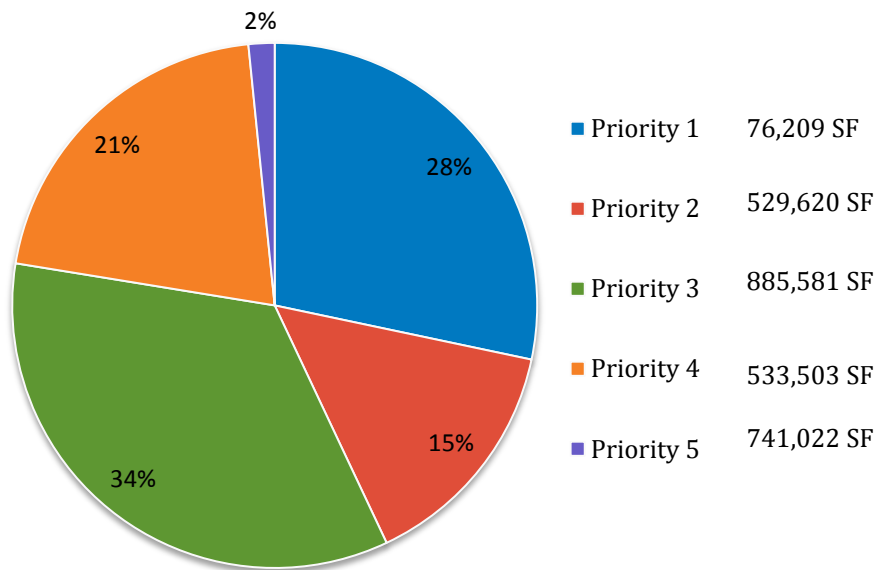


Figure 5.3.8.2

6. FINANCIAL DISCLOSURE

FY 2015 actuals have been made publicly available by BPA and contain BPA-approved Financial Information.

FY 2016-17 forecasts for Rate Case and Start of Year have been made publicly available by BPA and contains BPA-approved Financial Information.

FY 2017-19 IPR target and Proposed IPR levels have been made publicly available on June 10, 2016 and contains information not sourced directly from BPA financial statements.

7. ACRONYM GLOSSARY

AFUDC	Allowance for Funds used During Construction - The interest on debts issued to finance construction work-in-progress, normally financed through borrowing and eventually paid by ratepayers after projects are completed and placed in service.
AGC	Assistant General Counsel
AM	Asset Management
aMW	Average Megawatts - The unit of energy output over a year, equivalent to the energy produced by the continuous operation of one megawatt of capacity over a period of time; also an average of one million watts transferred over a period of time (often a year, thus average annual megawatts).
APRB	Additional Post-Retirement Contribution
B2H	<i>Boardman to Hemingway Transmission Project</i>
BA	<i>Balancing Authority</i> - Synonym for Load Control Area agency. The responsible entity that schedules generation on transmission paths ahead of time, maintains load-interchange-generation balance within a Balancing Authority Area, and supports interconnection frequency in real time.
BAA	<i>Balancing Authority Area</i> - The collection of generation, transmission, and loads within the metered boundaries of the Balancing Authority. The balancing authority maintains load-resource balance within this area.
BMAR	<i>Backlog of Maintenance and Repairs</i>
BiOps	<i>Biological Opinion</i> - Document resulting from formal consultation that states the opinion of the US Fish and Wildlife Service, or National Marine Fisheries Service, as to whether a federal action is likely to jeopardize the continued existence of listed species or results in destruction or adverse modification of critical habitat.
BPA	<i>Bonneville Power Administration</i> - The Federal power marketing agency under the Department of Energy responsible for marketing wholesale electric power from 31 Federal dams and one non-Federal nuclear plant throughout Washington, Oregon, Idaho, and western Montana and portions of California, Nevada, Utah, and Wyoming. BPA also sells and exchanges power with utilities in Canada and California. Also known as Bonneville.
CAISO	<i>California Independent System Operator</i>
CAO	<i>Chief Administrative Office</i>

CASP	<i>Critical Asset Security Plan - Provides the agency's strategy for the implementation of safeguards and security programs as they relate to protecting critical assets.</i>
CBC	<i>Customer Billing Center</i>
CCM	<i>Customer Contract Management</i>
CDM	<i>Customer Data Management - BPA-wide centralized web-based source for account and contact information for customers, associations, and developers, sharing data widely with other agency business line applications and systems; operated by the Customer Support Services Contract Management & Administration group.</i>
CGS	<i>Columbia Generating Station - Nuclear power plant owned by Energy Northwest, for which BPA markets all power. Formerly known as WNP2.</i>
CIP	<i>Critical Infrastructure Protection - Coordinates all of NERC's efforts to improve physical and cyber security for the bulk power system of North America as it relates to reliability.</i>
CIR	<i>Capital Investment Review – Finance public process occurring every two years, prior to the upcoming rate case.</i>
COOP	<i>Continuous Operations</i>
CP	<i>Customer Portal</i>
CRO	<i>Chief Risk Officer</i>
CSRS	<i>Civil Service Retirement System</i>
CSS	<i>Customer Support Service</i>
CWA	<i>Clean Water Act</i>
DCC	<i>Dittmer Control Center</i>
DOE	<i>Department of Energy - A Department established in 1977 by the Department of Energy Organization Act to consolidate the major Federal energy functions into one cabinet-level department that would formulate a comprehensive, balanced national energy policy. Responsible for regulatory, research, and marketing programs related to energy production and use. BPA is an agency of DOE. For more information: http://www.doe.gov</i>
DR	<i>Demand Response - Control program(s) to reduce consumer use of electricity during times of peak demand.</i>

DSI	<i>Direct Service Industry</i>
EE	<i>Energy Efficiency</i>
EEI	<i>Energy Efficiency Incentives</i>
EIM	<i>Energy Imbalance Market</i>
EIS	<i>Environmental Impact Statement</i> - The most intensive level of environmental analysis, public involvement and documentation, typically reserved for proposed actions that are expected to result in significant environmental impacts. The Environmental Impact Statement discloses the impacts of the action and alternatives on all applicable environmental resources. The Environmental Impact Statement process includes: public scoping; coordination with state, federal, and local agencies, and tribes; a draft Environmental Impact Statement sent to public for review and comment; a final Environmental Impact Statement; and a Record of Decision.
ELR	<i>Engineering Line Rating</i>
ENW	<i>Energy Northwest</i>
EP	<i>Emergency Preparedness</i>
EPRI	<i>Electric Power Research Institute</i> - A nationwide research organization sponsored by 680 utilities and dedicated to discovering, developing, and delivering new technologies for electric power generation and transmission and for demand-side management.
ERM	<i>Enterprise Risk Management</i> - Strategic business discipline that supports the achievement of an organization's objectives by addressing the full spectrum of its risks and managing the combined impact of those risks as an interrelated risk portfolio. ERM provides a disciplined process for managing risk and seeks to embed this discipline in existing business processes.
ESA	<i>Endangered Species Act</i> - A 1973 Federal law, amended in 1978 and 1982, to protect troubled species from extinction. The National Marine Fisheries Service and U.S. Fish and Wildlife Service decide whether to list species as threatened or endangered. Federal agencies must avoid jeopardy to and aid the recovery of listed species. Similar responsibilities apply to non-Federal entities.
ESRP	<i>Energy Smart Reserved Power</i>
FAM	<i>Facilities Asset Management</i>
FCI	<i>Facility Condition Index</i>
FCRPS	<i>Federal Columbia River Power System</i> - The transmission system constructed and operated by BPA and the hydro-electric dams constructed and operated by the U.S. Army Corps of Engineers and

the Bureau of Reclamation in the Northwest. Each entity is separately managed and financed, but the facilities are operated as an integrated power system.

FEHB *Federal Employees Health Benefits Program*

FEOSH *Federal Employee Occupational Safety and Health Program*

FERC *Federal Energy Regulatory Commission* - The Federal agency that reviews hydroelectric projects and applications for operating licenses, and regulates interstate aspects of electric power and natural gas industries. The agency to which BPA submits its proposed power rate adjustments for approval. Formerly Federal Energy Administration.

FERS *Federal Employee Retirement System*

FMD *Fleet Management Department*

FTE *Full Time Equivalent* - A full-time-equivalent staff-year, which is derived by dividing the number of paid straight-time hours accumulated during a period of time by 2,080 (26 annual pay periods 80 hours per period). This differs from the 2,087 hours used for payroll computations. FTE is a concept for managing the size of a workforce under which limitations are placed on the cumulative number of hours that can be paid during a given period to various categories of employees, as contrasted with concepts which place limitations on the maximum size of the workforce.

G&A *General and Administrative*

GHG *Green House Gas* - Gases, including carbon dioxide (CO₂), methane (CH₄), nitrogen oxides (NO_x), nitrous oxide (NO₂), and water vapor (H₂O) that contributes to the greenhouse effect.

GI *Generation Interconnection* - Provides services for interconnection to the Federal Columbia River Transmission System. BPA interconnection procedures adhere to the requirements of its Open Access Transmission Tariff.

GRC *Governance, Risk and Compliance*

GSP *DOE's Graded Security Protection*

HCM *Human Capital Management*

HR *Human Resources*

HRT *Hatchery Review Team*

HVDC *High Voltage Direct Current*

IPR *Integrated Program Review – Finance public process occurring every two years, prior to the*

upcoming rate case.

- IVM** *Integrated Vegetation Management* - is a strategy to cost effectively control vegetation with the most benign overall long-term effect on public health and safety and the ecosystem. IVM tries to maximize favorable effects and minimize potential negative effects.
- KPI** *Key Performance Indicator*
- KSI** *Key Strategic Initiative*
- KSL** *BPA Load Forecasting and Analysis*
- KW** *Kilowatts* - An electrical unit of power; one kilowatt equals 1,000 watts.
- LiDAR** *Light Detection and Ranging* - is an optical remote sensing technology that can measure the distance to, or other properties of a target by illuminating the target with light, often using pulses from a laser.
- LRP** *Long Range Plan*
- LSRCP** *The Lower Snake River Compensation Plan* - A series of 13 fish hatcheries on the Lower Snake to mitigate the damage done to fish by the construction of Lower Monumental, Little Goose, Lower Granite, and Ice Harbor dams. Authorized by Congress in the mid-1970s, constructed by the U.S. Army Corps of Engineers, operated and maintained by the U.S. Fish and Wildlife Service. Expenses are repaid to the U.S. Treasury by BPA from power sales revenues, except one hatchery with shared funding.
- MCC** *Munro Control Center*
- MW** *Megawatts* - The electrical unit of power which is equal to 1,000 kilowatts, or 1,000,000 watts.
- NAESB** *North American Energy Standards Board* - serves as an industry forum for the development and promotion of standards which will lead to a seamless marketplace for wholesale and retail natural gas and electricity, as recognized by its customers, business community, participants, and regulatory entities.
- NEIL** *Nuclear Electric Insurance Limited* - Mutual insurance company established to provide insurance coverage for replacement power costs resulting from an accidental outage at a member's nuclear site, and excess property damage and decontamination liability.
- NEPA** *National Environmental Policy Act* - A 1969 Federal law that requires evaluation of the environmental impact of Federally funded projects and programs. Generally requires an environmental assessment and/or an environmental impact statement be submitted to the Federal government before a project can begin.

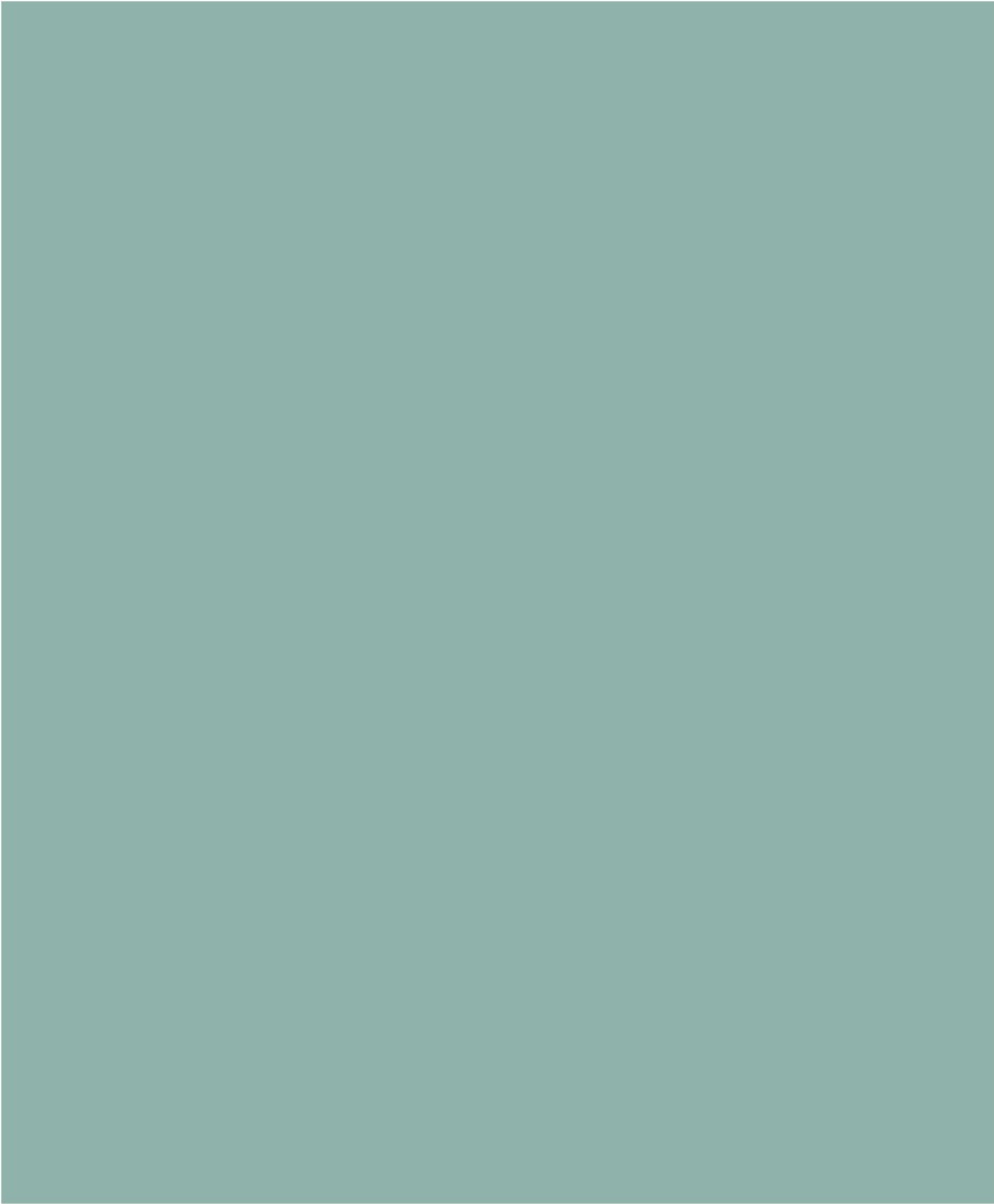
- NERC** *North American Reliability Corporation* - A council consisting of nine Regional Reliability Councils/Corporations, encompassing virtually all of the power systems in the U.S. and Canada. Formed by the electric utility industry in 1968 and incorporated in 1975 to promote reliable and adequate supplies of bulk electric power.
- NFPA** *National Fire Protection Association*
- NMFS** *National Marine Fisheries Service* - An agency of the U.S. Department of Commerce that oversees ocean and river fish harvest limits and determines which stocks are to be listed as endangered or threatened under the Endangered Species Act.
- NOAA** *National Oceanographic & Atmospheric Administration*
- NOS** *Network Open Season* - Initiative to manage and respond to long-term firm transmission requests on the BPA network.
- NRC** *Nuclear Regulatory Commission* - The Federal agency that regulates, inspects, and oversees all activities involved with nuclear power plant generation to assure the safety of U.S. nuclear power plants. For more information: <http://www.nrc.gov>
- NT** *Network Integration Transmission Rate*
- NWPCC** *Northwest Power and Conservation Council* - An eight-member council, established by the Pacific Northwest Electric Power Planning and Conservation Act. Comprised of two voting members from the four Northwestern states: Washington, Oregon, Idaho, and Montana. Helps guide BPA and the region with planning for conservation and generation resources and for protection, mitigation, and enhancement of fish and wildlife in the Columbia River Basin.
- O&M** *Operations and Maintenance*
- OASIS** *Open Access Same-time Information System* - Real-time information-sharing system that enables all buyers and sellers of electricity to access the transmission costs for all other buyers and sellers, to eliminate unfair advantages between utility transmission owners and their affiliates; a website used to communicate with customers, provide transmission system information, process requests for transmission service, and post SOC requirements.
- OATI** *Open Access Technology International*
- OATT** *Open Access Transmission Tariff* - Tariff for use of high-voltage transmission lines required by FERC under its Order 888. Designed to facilitate open, nondiscriminatory access to all transmission facilities by all power providers; terms and conditions by which BPA provides nondiscriminatory transmission service that is similar to the Federal Energy Regulatory Commission's pro forma tariff mandated for FERC jurisdictional utilities.

OGC	<i>Office of General Counsel</i> - General Counsel provides legal expertise, which supports Bonneville Power Administration (BPA) programs through legal advice and representation, including but not limited to the general areas of transmission, natural resources, power, lands, federal resources and treaties, generation and finance, personnel, and ratemaking.
OMB	<i>Office of Management and Budget</i>
OPM	<i>Office of Personnel Management</i>
OSCO	<i>Office of Security and Continuity of Operations</i>
OSHA	<i>Occupational Health and Safety Act</i>
PASS	<i>Project Alternative Solutions Study</i>
PCB	<i>Polychlorinated Biphenyl</i> - Oily, persistent substance formerly manufactured for use in electrical equipment, primarily as a dielectric in capacitors. Banned from use in the manufacture of equipment in 1979 after research showed that PCBs cause skin disease and liver damage, and are a suspected carcinogen.
PFIA	<i>Project Funded in Advance</i>
PIT	<i>Passive Integrated Transponder</i> - A miniature computer chip (about the size of a grain of rice) implanted in a fish to collect data on its migration.
PP&A	<i>Pollution Prevention and Abatement</i>
PSC	<i>Power System Control</i>
QBI	<i>Quality Bill Initiative</i>
QBR	<i>Quarterly Business Review</i>
RAS	<i>Reliability Assessment Subcommittee</i>
ROD	<i>Record of Decision</i>
ROW	<i>Right-of-Way</i> - An easement for a certain purpose over the land of another, such as the strip of land used for a road, electric transmission line, ditch, or pipeline. BPA usually acquires easements for its transmission lines, roads, and other facilities such as guys and anchors.
SaaS	<i>Software as a Service</i> - is a software delivery model in which software and associated data are centrally hosted on the cloud. SaaS is typically accessed by users using a thin client via a web browser.

SCADA	<i>Supervisory Control and Data Acquisition</i> - The centralized computer system that includes transmission of numerical quantities and alarms from substations to a control center.
SCS	<i>Supply Chain Services</i>
SILS	<i>Southern Idaho Load Service</i>
SLMO	<i>Supplemental Labor Management Office</i>
SOL	<i>System Operating Limit</i>
SOY	<i>Start-of-Year Forecast</i>
SPC	<i>System Protection & Control</i> - responsible for testing, checking, maintaining, and adjusting meters, relays, controls, and other equipment in BPA substations. SPC is the technical expert on obsolete equipment no longer supported by the manufacturer, but still on BPA's system.
T&C	<i>Trades and Crafts</i>
TCMS	<i>Transmission Curtailment Management Service</i> - A service BPA will provide to customers with a qualifying resource when a transmission curtailment occurs between such resource and the customer load.
TCRM	<i>Transacting and Credit Risk Management</i>
TI	<i>Technology Innovation</i> - Uses a cross agency Council of executives and technologists to guide its research and development efforts.
TLM	<i>Transmission Line Maintenance</i>
TPP	<i>Third Power Plant (Grand Coulee)</i> - 3,900 mW generating station located at Grand Coulee Dam
TT	<i>Technical Training</i>
USFWS	<i>U.S. Fish and Wildlife Service</i> - An agency within the Department of the Interior responsible for guiding conservation, development, and management of U.S. fish and wildlife resources. For more information: http://www.fws.gov
VDI	<i>Virtual Desktop Infrastructure</i> - Sometimes referred to as virtual desktop interface, is the server computing model enabling desktop virtualization, encompassing the hardware and software systems required to support the virtualized environment.
VERBS	<i>Variable Energy Resource Balancing Service</i>

WECC *Western Electricity Coordinating Council* - 2002 successor to the Western Systems Coordinating Council as the organization responsible for coordinating and promoting bulk electric system reliability of transmission operators within the western interconnection. It was formed through the merger of the WSCC, the Western Regional Transmission Association and the Southwest Regional Transmission Association. It provides a forum for resolving transmission access disputes, and provides an environment for coordinating the operating and planning activities of its members. For more information: <http://www.wecc.biz/About/Pages/default.aspx>

WNP *Washington Nuclear Project*



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