

Bonneville Power Administration Long-Term Reference Case: Assumptions & Outputs

October 27, 2015

Location: BPA Rates Hearing Room, 1201 NE Lloyd Blvd., Suite 200

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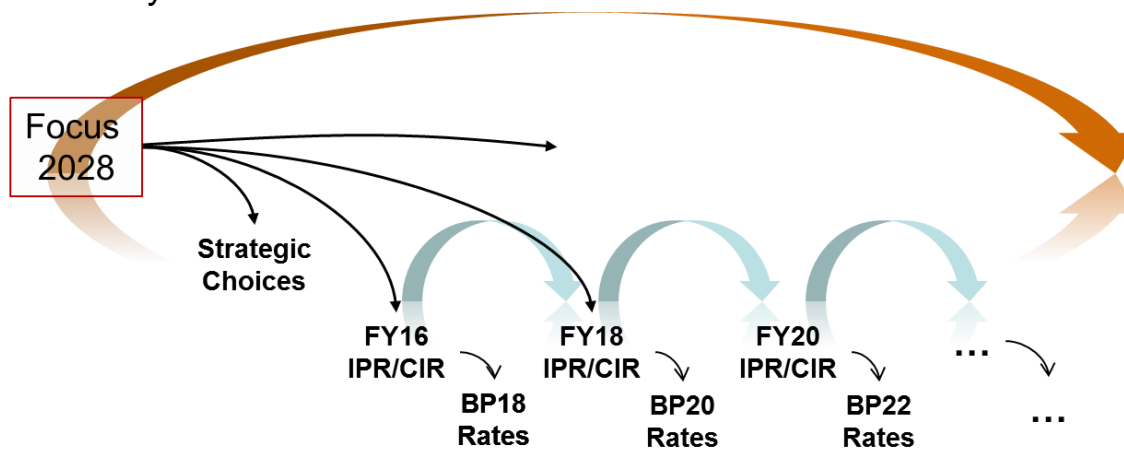
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Introduction

- Bonneville Power Administration (BPA) has produced a means for analyzing and comparing impacts of strategic choices and an initial Long-Term Reference Case (Reference Case) as a basis for comparison.
- The Reference Case is a 15-year analysis of BPA's financial condition and rates using spending level assumptions from recent public processes and current escalation, market and load forecasts.
- Through BPA Focus 2028, BPA, its customers, tribes and stakeholders will consider major sources of uncertainty and potential impacts of strategic alternatives that can be analyzed and compared with the Reference Case.
- Discussions about BPA's proposed nearer-term actual investment and expense levels will occur during the routine Capital Investment Review (CIR) and Integrated Program Review (IPR) processes next year.



Reference Case Overview

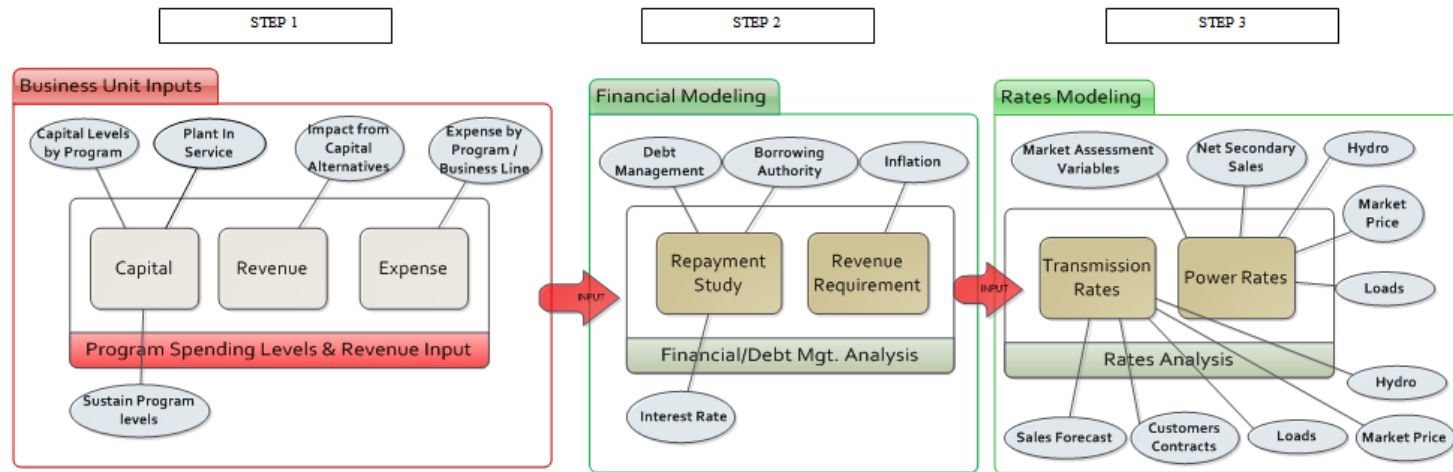
A 15-year analysis of the BPA's financial condition and rates using spending levels from recent public processes and current cost escalation, as well as market and load forecasts. The Reference Case provides the following:

- A beginning point for strategic discussions.
- A basis for comparing the financial and rates implications of future scenarios or alternatives being considered for important business decisions.
- Assessment of metrics for BPA's future financial health.

The Reference Case is not intended to:

- Represent a decision about the future nor specific proposals.
- Supplant assumptions vetted through formal public processes such as the IPR or CIR.
- Apply expert judgement on whether program and capital levels may change over time, or potential impacts of external factors outside of BPA's control.
- Represent BPA's projection of actual financial health and rates as it does not capture the many uncertainties surrounding the assumptions.

Reference Case Process



- **Step 1- Business Unit Inputs:**
 - Assumptions are gathered for capital program investment, revenue impacts from assumed capital investment and expense program spending based on the IPR and CIR.
- **Step 2- Financial Modeling:**
 - Repayment study analysis is prepared using the assumed capital portfolio and debt management assumptions in step one.
 - The resulting debt and interest expenditures are combined with the assumed program spending to prepare revenue requirements for Power and Transmission.
- **Step 3- Rates Modeling:**
 - Based on the revenue requirement analysis prepared in step 2, along with market conditions, loads, sales and contract assumptions, Power and Transmission rates analysis are prepared.

Key Assumptions

Type	Summary of Assumptions
Capital	<ul style="list-style-type: none"> • Forecasts in FYs 16-17 are consistent with Final 2014 CIR and IPR spending levels. FYs 18-23 match CIR – updated for IPR2 (which excludes Energy Efficiency) spending levels. Forecasts in FYs 24-30 reflect a 9 year average of CIR spending levels (with adjustments for Energy Efficiency) increasing annually at the common agency inflation rate.
Expense	<ul style="list-style-type: none"> • BP-16 Final Proposal for FYs 16-17. • Most program expense between FYs 18-30 are inflated from BP-16 Final Proposal expense using common agency inflation assumptions unless specified in Programmatic/Detailed Assumptions section below. • Non-federal debt service reflects full Energy Northwest debt extension.
Transmission Rates	<ul style="list-style-type: none"> • The NT loads use the 12 Non-Coincidental peak for allocation of costs and 12 Coincidental peak for billing determinants to calculate rates. This was used in the BP-16 Initial Proposal and was assumed for twenty years. • The growth rate is approximately 1%.
Power Rates	<ul style="list-style-type: none"> • In order not to obscure the effect of BPA's costs on power rates in the Reference Case, future revenues from secondary sales and purchased power costs are held at BP-16 levels, adjusted for inflation. • The risk bands around the Reference Case include expected Mid-C prices modeled using AURORA using all regular risk modeling (e.g., hydro variation, gas prices, loads). The forecast includes: <ul style="list-style-type: none"> –50% California RPS by 2030 –Henry Hub gas prices \$3.30/6.74 CY 2016/2030 (nominal) with risk variation –Regional annual load growth 0.7% with weather and economic risk variation –Carbon pricing is not taken into account in the forecast • No significant changes in BPA firm requirements power obligations or BPA resources (T1SFCO reductions due to expiration of the <u>Wauna</u> cogeneration contract and renewables assumptions). • COE/USBR/CGS costs consistent with 2014 CIR and IPR. • Residential Exchange costs follow the Settlement through 2028 and assume the same 7% per rate period escalation thereafter. Risk analysis shows expectations that the actual post-settlement amounts could be between \$0-\$600 million.
Debt Management	<ul style="list-style-type: none"> • Debt management modeling ensures at least \$750 million US Treasury Borrowing Authority is available on an annual basis. • 50% of the Transmission capital program is financed through the lease purchase program. • Assumes full Regional Cooperation Debt program. • Conservation 100% expensed starting in 2016. • No additional customer prepaids.

Rates Comparisons and Performance Metrics

	Nominal \$ 2016	Nominal \$ 2018	Nominal \$ 2030	Real \$ 2016 (2014 dollars)	Real \$ 2018 (2014 dollars)	Real \$ 2030 (2014 dollars)
PF Rate (Tier 1)	33.75	35.32	43.48	32.40	32.52	32.50
NT Rate	1.74	1.83	2.42	1.69	1.69	1.80
PTP Rate	1.49	1.56	2.06	1.49	1.44	1.54
IS Rate	1.23	1.35	1.71	1.20	1.24	1.28

- Rates in the Reference Case appear nearly level in 2030 in real dollar terms for both Transmission and Power.

Financial Metrics	FY 2016	FY 2030
Rate of Change for IPR Costs (Rate of Cost Change / Inflation)*	---	Px: 1.47 Tx: 0.97
Rate of Change in Capital Related Costs (Rate of Cost Change / Inflation)*	---	Px: (0.08) Tx: 2.14
Financial Reserve Level	\$830M	\$755M
Days Cash on Hand	144	94
Remaining Borrowing Authority	\$2,423M	\$1,289M
Interest Expense as % of Revenue Requirement	18.73%	15.35%
Weighted Avg. Maturity of Debt Portfolio (Years)	23.09	19.82
Debt to Assets Ratio	89%	73%

* For 2014 IPR and CIR costs, BPA's average assumed rate of inflation for the period of 2016 through 2030 is 1.9%. In the table above, 1.0 represents the rate of inflation. Anything above 1.0 means that costs are increasing at a rate higher than inflation. Anything below 1.0 means rate of change is less than the rate of inflation.

Transmission Potential Rate Change Detail

Transmission Potential Rate Change Detail (in nominal \$Million)

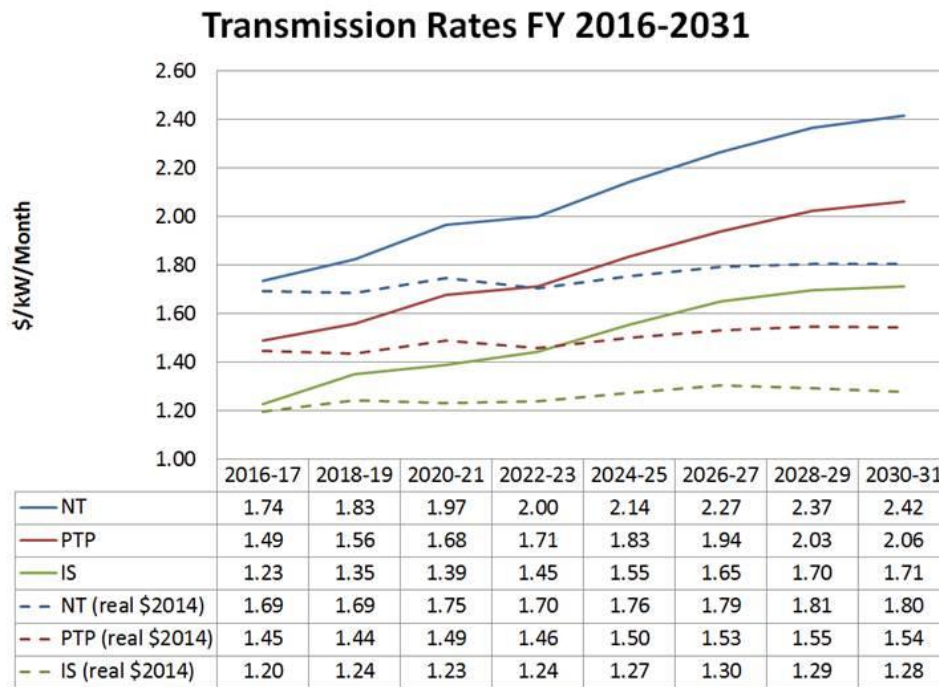
Expenses	A		B		C		D		E		F		G		H		I		J		K		L		M		N		
	Change from BP-16 FP to FY 18/19		Change from FY 18/19 to FY 20/21		Change from FY 20/21 to FY 22/23		Change from FY 22/23 to FY 24/25		Change from FY 24/25 to FY 26/27		Change from FY 26/27 to FY 28/29		Change from FY 28/29 to FY 30/31																
	\$ (Million)	% Change in Rev. Req.	\$ (Million)	% Change in Rev. Req.	\$ (Million)	% Change in Rev. Req.	\$ (Million)	% Change in Rev. Req.	\$ (Million)	% Change in Rev. Req.	\$ (Million)	% Change in Rev. Req.	\$ (Million)	% Change in Rev. Req.	\$ (Million)	% Change in Rev. Req.	\$ (Million)	% Change in Rev. Req.	\$ (Million)	% Change in Rev. Req.	\$ (Million)	% Change in Rev. Req.	\$ (Million)	% Change in Rev. Req.	\$ (Million)	% Change in Rev. Req.	\$ (Million)	% Change in Rev. Req.	
1 Operations	15	1.3%	6	0.4%	7	0.2%	7	0.5%	8	0.5%	8	0.6%	7	0.4%															
2 Maintenance	5	0.5%	6	0.4%	7	0.2%	7	0.5%	7	0.5%	8	0.5%	6	0.3%															
3 Engineering	3	0.3%	3	0.2%	4	0.1%	5	0.4%	5	0.3%	4	0.3%	3	0.2%															
4 Internal Support & Undistributed Reduction	3	0.3%	3	0.2%	3	0.1%	3	0.2%	3	0.2%	3	0.2%	2	0.1%															
5 IPR Sub-total	26	2.4%	19	1.1%	20	0.6%	22	1.6%	22	1.4%	23	1.6%	18	1.0%															
6 Ancillary Services	9	0.8%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%															
7 Non-IPR Sub-total	9	0.8%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%															
8 Capital Related Costs 1/	44	4.1%	76	4.4%	49	1.5%	74	5.4%	67	4.3%	41	3.0%	21	1.2%															
9 Total Change in Revenues (Lines 5+7+8) 2/	80	7.3%	96	5.5%	69	2.1%	96	7.0%	90	5.7%	64	4.6%	39	2.2%															

1/ Includes Net Interest Expense, Depreciation/Amortization and Minimum Required Net Revenues

2/ This change in revenue also equals the weighted average rate change by rate period.

- The Capital Related Costs (row 8) are the primary driver of projected rate increases. Potential *significant* additional capital spending needs beyond the CIR levels are not factored into this analysis.
- Other aspects of the revenue requirement increases are primarily driven by the inflation assumption.
- There was no assumption made for Ancillary Services.

Transmission Rates



- The increase in IS rate for BP-18 is due to the full effect of the energization of the Celilo Converter upgrade and the related capital costs that begin to affect revenue requirements in that rate period.
- The increase in the network rates and their related costs are fully included in BP-20 and are mainly due to the assumption that a new I-5 Corridor Reinforcement Project is built and fully energized in 2020/21 and the capital costs associated with this project begin to affect revenue requirements in the BP-20 rate period.
- The capital related costs associated with the capital expenditure assumption (inflation of the 2015-2023 average CIR levels) are the primary driver of projected rate increases in BP-24 and beyond. Other aspects of the revenue requirement increases reflect the inflation assumption

Power Potential Rate Change Detail

Power Potential Rate Change Detail (in nominal \$Million)												
	A Change from FY16/17 to FY18/19		B Change from FY18/19 to FY20/21		C Change from FY20/21 to FY22/23		D Change from FY22/23 to FY24/25		E Change from FY24/25 to FY26/27/28		F Change from FY26/27/28 to FY29/30	
Expenses	\$ (Million)	% Change in Rates	\$ (Million)	% Change in Rates	\$ (Million)	% Change in Rates	\$ (Million)	% Change in Rates	\$ (Million)	% Change in Rates	\$ (Million)	% Change in Rates
1 Columbia Generating Station	43	2.1%	20	1.0%	38	1.6%	22	0.9%	62	2.5%	71	2.8%
2 Bureau of Reclamation	(14)	-0.7%	0	0.0%	9	0.4%	8	0.3%	11	0.4%	12	0.5%
3 Corps of Engineers	15	0.7%	16	0.8%	15	0.7%	15	0.6%	21	0.8%	23	0.9%
4 Residential Exchange	19	0.9%	11	0.5%	15	0.6%	16	0.7%	11	0.5%	13	0.5%
5 Fish and Wildlife	15	0.7%	16	0.7%	17	0.7%	18	0.8%	24	1.0%	25	1.0%
6 Energy Efficiency	26	1.3%	68	3.2%	(0)	0.0%	3	0.1%	0	0.0%	(7)	-0.3%
7 Transmission and Ancillary Services	18	0.9%	6	0.3%	3	0.1%	8	0.3%	11	0.4%	7	0.3%
8 Internal Operations	17	0.8%	4	0.2%	(1)	0.0%	7	0.3%	9	0.4%	9	0.3%
9 Capital-Related Costs	(74)	-3.7%	48	2.3%	20	0.9%	18	0.8%	8	0.3%	(42)	-1.6%
10 Other Costs	3	0.2%	5	0.2%	6	0.2%	7	0.3%	11	0.5%	9	0.3%
11 Expense Sub-Total	68	3.3%	195	9.2%	121	5.3%	121	5.2%	167	6.8%	119	4.6%
Revenues and Costs Affected by Gas Price												
12 Net Power Purchase and Sales*	2	0.1%	(22)	-1.0%	(49)**	-2.2%	(18)	-0.8%	(29)	-1.2%	(22)	-0.9%
13 4(h)(10)(C)	(2)	-0.1%	(7)	-0.3%	(5)	-0.2%	(7)	-0.3%	(8)	-0.3%	(9)	-0.3%
14 Generation Inputs	3	0.1%	(6)	-0.3%	(9)	-0.4%	(8)	-0.3%	(11)	-0.5%	(12)	-0.5%
15 DSI Sales	(1)	-0.1%	0	0.0%	(1)	0.0%	(1)	-0.1%	(2)	-0.1%	(2)	-0.1%
16 Other Revenues	31	1.5%	15	0.7%	(0)	0.0%	3	0.1%	3	0.1%	(1)	0.0%
17 Revenues Sub-Total	32	1.6%	(19)	-0.9%	(64)	-2.8%	(32)	-1.4%	(47)	-1.9%	(45)	-1.8%
18 Load Effect		0.1%		-1.2%		0.1%		-0.3%		-0.2%		0.8%
19 Total Change in Net Revenue Requirement	100	5.0%	176	7.1%	57	2.5%	89	3.4%	120	4.7%	73	3.7%

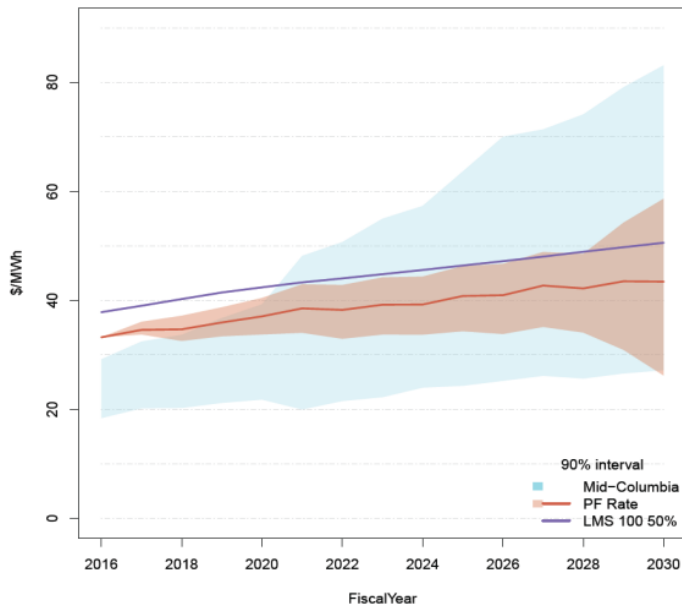
*Net Power Purchase and Sales includes the value of net secondary, decremented for augmentation purchases. Net secondary was held constant in real terms, starting in FY 2016/17. Augmentation purchases were computed based upon forecast augmentation need, valued at FY 2016/17 prices escalated at the rate of inflation.

**Incorporates the roll-off of the interim SE Idaho load service hedge power purchases; assumes transmission solution post the bridge agreement period.

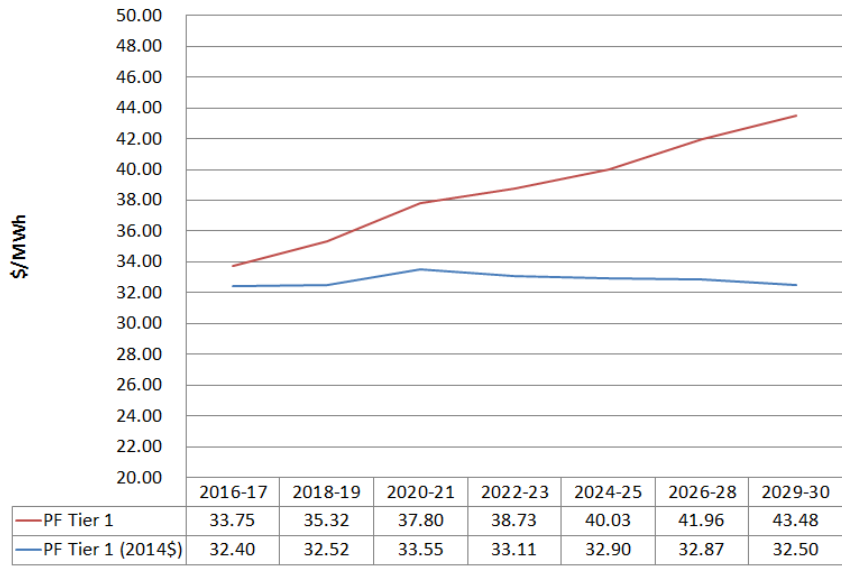
- Increases in IPR-related costs are primarily due to system generating assets, BPA’s Fish and Wildlife program, and Residential Exchange.
- The uptick in power rates between 2018-19 and 2020-21 rates is due to the expiration of rate mitigation actions taken to offset the effects of moving BPA’s Energy Efficiency program from capital to expense.
- Capital-related costs for this analysis (row 9) remain relatively stable over the planning horizon. Potential additional capital spending needs beyond the CIR levels are not factored into this analysis.

Power Rates

Power Rates Compared to Mid-C



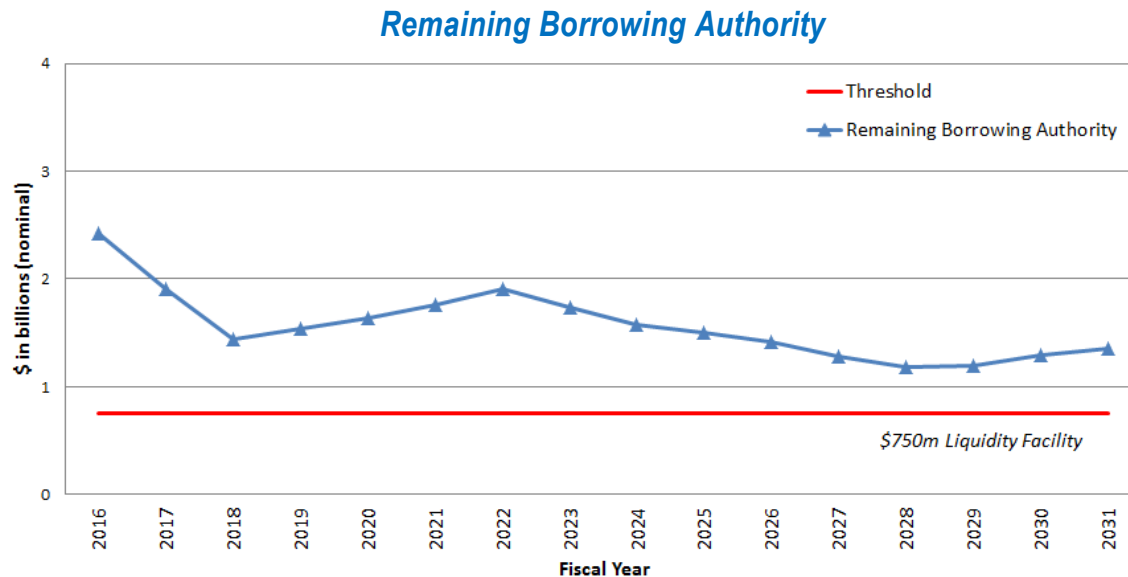
Preference Tier 1 (PF) Rates, FYs 2016-2030



- Power rates are expected to remain flat in real terms over the planning horizon, with the overall nominal increases in rates at or slightly below the forecast level of inflation through 2030.
- The Reference Case is informed by a modeled risk distribution that incorporates load, resource, natural gas and electric market variability into the analysis.

Remaining Borrowing Authority

- Virtually all capital investments are financed through debt.
- Debt management assumptions in the Reference Case are consistent with achieving three primary objectives:
 - Ensuring capital financing requirements are met at the lowest overall cost;
 - Ensuring long-term cost stability for each business unit; and
 - Maintaining \$750 million of access to the U.S. Treasury Borrowing Authority for the short-term liquidity note.
 - After the use of 3rd party tools (full Regional Cooperation Debt Program and 50% Lease Purchase), maintaining the \$750 million is achieved through the accelerated repayment of Federal debt.



Next Steps

- This reference case was built to serve as a basis for comparative analysis, providing context against which to evaluate alternative assumptions or conditions.
- BPA has the capability to build scenarios that vary elements such as the scale and timing of BPA's capital investments and repayments, the level of BPA's IPR spending, changes to the amount of BPA's lease financing, among others.
- BPA will host a listening session in November for interested stakeholders to provide inputs on topics for the February Focus 2028 Forum as well as inputs on variables and assumptions BPA may include in its scenario analysis.
- Resulting scenarios will be part of the BPA Focus 2028 forum in February and will aid the discussion of BPA's potential choices and future conditions.

Financial Disclosure

This information has been made publicly available by BPA on October 23, 2015 and contains information not reported in agency financial statements.