Leverage Policy

March 20, 2018, 10 a.m.

BPA Rates Hearing Room

WebEx: join the meeting

Meeting Number: 900 950 573

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Leverage Policy timeline

- March-April 2018: conduct public workshops, receive feedback on and refine proposals.
  - March 20: Public workshop.
    - Comments on policy proposal due by April 6. Comments submitted via email to BPAFinance@bpa.gov.
  - April 20: Public workshop.
    - April 20 – May 11: Official public comment period. Comments to be submitted to the BPA comment page (www.bpa.gov/goto/comment).
- June: Publish final ROD.

Policy implementation

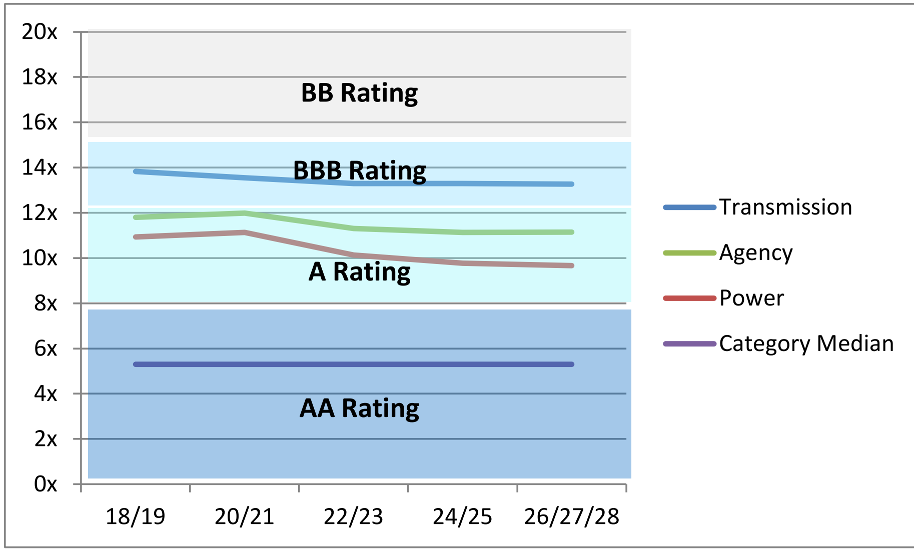
- Elements of the record of decision:
  - Establish policy framework.
    - Metric: debt-to-asset ratio.
    - Goals: 75-85% by 2028, 60-70% long term for the agency and each business line.
    - Trigger: Agency, Power, and Transmission ratios will stay the same or improve towards debt-to-asset ratio goals.
- Elements to be decided within rate case 7(i) process:
  - Establish specific ratio milestones for the rate period in accordance with the policy.
  - Identify which tool(s) will be used to implement the policy e.g.
    - Additional debt repayment, revenue finance capital investments, expense investments previously capitalized.
    - Reduce capital investments.

Leverage metrics

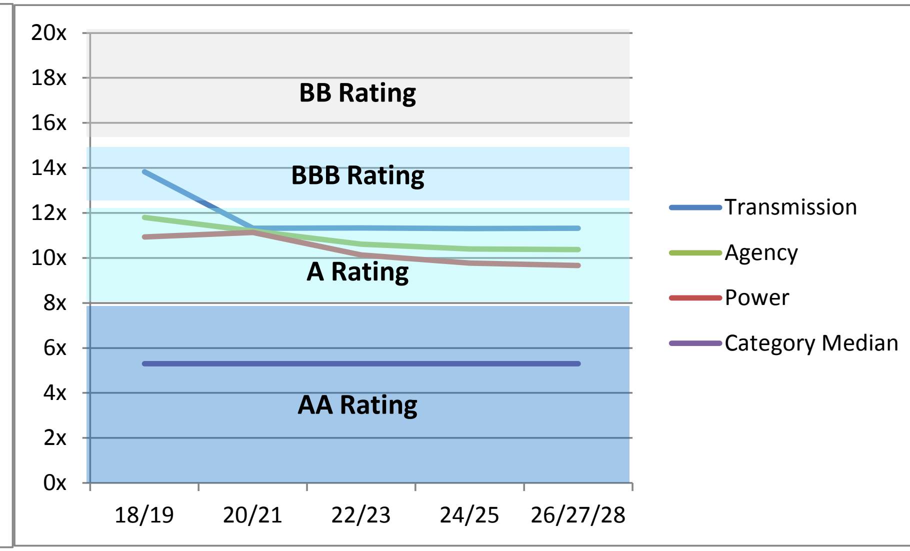
- Industry leverage ratios typically fall into one of three buckets:
  - Debt ratio.
  - Debt-to-equity ratio.
  - Interest coverage ratio.
- Moody's tracks BPA's debt ratio in each rating report: see latest report
- Fitch has multiple metrics they track to show leverage including:
  - Debt/Funds Available for Debt Service (FADS).
  - Adjusted Debt (Including Purchased Power Adjustment)/Adjusted FADS (Including Purchased Power Adjustment).
  - Net Debt/Net Capital Assets.
  - Equity/Capitalization.
  - Debt/Capitalization.
  - Adjusted Debt/Capitalization.
- Fitch's primary focus is on Debt/FADS & Net Debt/Net Capital Assets.
- Debt/FADS.
  - A coverage ratio measuring net debt (total debt less reserves for risk) in relation to cash from operations (Funds Available for Debt Service). Lower is better, industry median is 5.3x.
  - Highlights roughly the rate at which debt can be repaid.
- Debt/Asset.
  - Measure of total debt relative to book value of assets. Lower is better, industry median of 54%.
  - The higher the ratio, the greater the amount of fixed costs, both principal and interest, that have to be repaid in the future with uncertain revenues.
  - A reflection of longer-term solvency and at a high level how capital investments have been financed, either with debt or equity.

Applying leverage policy to Debt/FADS

Status quo



Status quo + leverage policy*



- The ratio shows how many times greater an entities' net debt outstanding is relative to its cash from operations (FADS) in a single fiscal year. The lower the ratio, the better.
- Similar to the debt-to-asset ratio, BPA is well above the category median, meaning BPA is highly leveraged from both ratio views.
- Power is in a better position than transmission due to having lower debt compared to FADS. That is, Power has greater cash flow from operations relative to its net debt than Transmission.
- Meeting stated leverage goals will improve BPA's leverage from either perspective, the debt-to-asset ratio (see slide 11) or Debt/FADS.

*assumes Power scenario 1 on slide 9 and Transmission scenario 2 on slide 10.

How would the policy have affected BP-18?

- The below slides show the rate period debt-to-asset ratio projections based on the BP-18 final proposal for Power and Transmission.
- Power's debt-to-asset ratio declines by nearly 4%, therefore no action would have been needed to keep Power's debt-to-asset ratio from getting any worse. Transmission's debt-to-asset ratio goes up over the rate period, therefore some action would have been needed.

Power

($000s)

		Q2	BP-18	BP-18
	Debt	**FY17**	**FY18**	**FY19**
1	Starting Debt	10,138,976	10,086,429	10,082,199
2	New Debt	564,018	563,889	453,731
3	Amount Revenue Financed	-	-	-
4	Capital Reductions	-	-	-
5	Repayment	(616,565)	(568,119)	(603,477)
6	Additional Repayment	-		
7	Total Debt	10,086,429	10,082,199	9,932,453
	Assets			
8	Starting Plant	9,751,147	9,968,673	10,150,293
9	New Plant	491,871	512,889	409,731
10	Reductions to Capital Investment	-	-	-
11	Depreciation	(144,092)	(144,092)	(144,065)
12	NF Gen Reduction	(130,253)	(187,177)	(176,398)
13	Adjustments	-	-	-
14	Net Utility Plant	9,968,673	10,150,293	10,239,561
15	Debt to Asset Ratio	101.18%	99.33%	97.00%

Ratio is lower. No action needed

Transmission

($000s)

		Q2	BP-18	BP-18
	Debt	**FY17**	**FY18**	**FY19**
1	Starting Debt	5,502,414	5,572,000	5,837,852
2	New Debt	499,849	507,135	523,687
3	Amount Revenue Financed	-	-	-
4	Capital Reductions	-	-	-
5	Repayment	(298,207)	(241,283)	(252,319)
6	Additional Repayment	-		
7	Total Debt	5,572,000	5,837,852	6,109,220
	Assets			
8	Starting Plant	6,926,062	6,993,400	7,244,562
9	New Plant	499,849	522,135	538,687
10	Reductions to Capital Invest	-	-	-
11	Depreciation	(257,415)	(270,973)	(282,159)
12	Adjustments	-	-	-
13	Net Utility Plant	6,993,400	7,244,562	7,501,090
14	Debt to Asset Ratio	79.68%	80.58%	81.44%

Ratio is higher. Action needed

Adjusting the final proposal

- The two tables below are both for Transmission, since Power's ratio was projected to decline over the rate period.
- For this illustration, BPA assumed it brought Transmission's debt-to-asset ratio into compliance with the leverage policy by either assuming some capital investments are paid for by revenue financing or by increasing debt repayment above repayment methodology requirements.
- The table on the left shows how Transmission's debt-to-asset ratio could be held flat by increasing debt repayment.
- The table on the right shows how Transmission's debt-to-asset ratio could be held flat by revenue financing capital investments.
- Both result in the same dollar impact to achieve the same debt-to-asset ratio over the rate period.

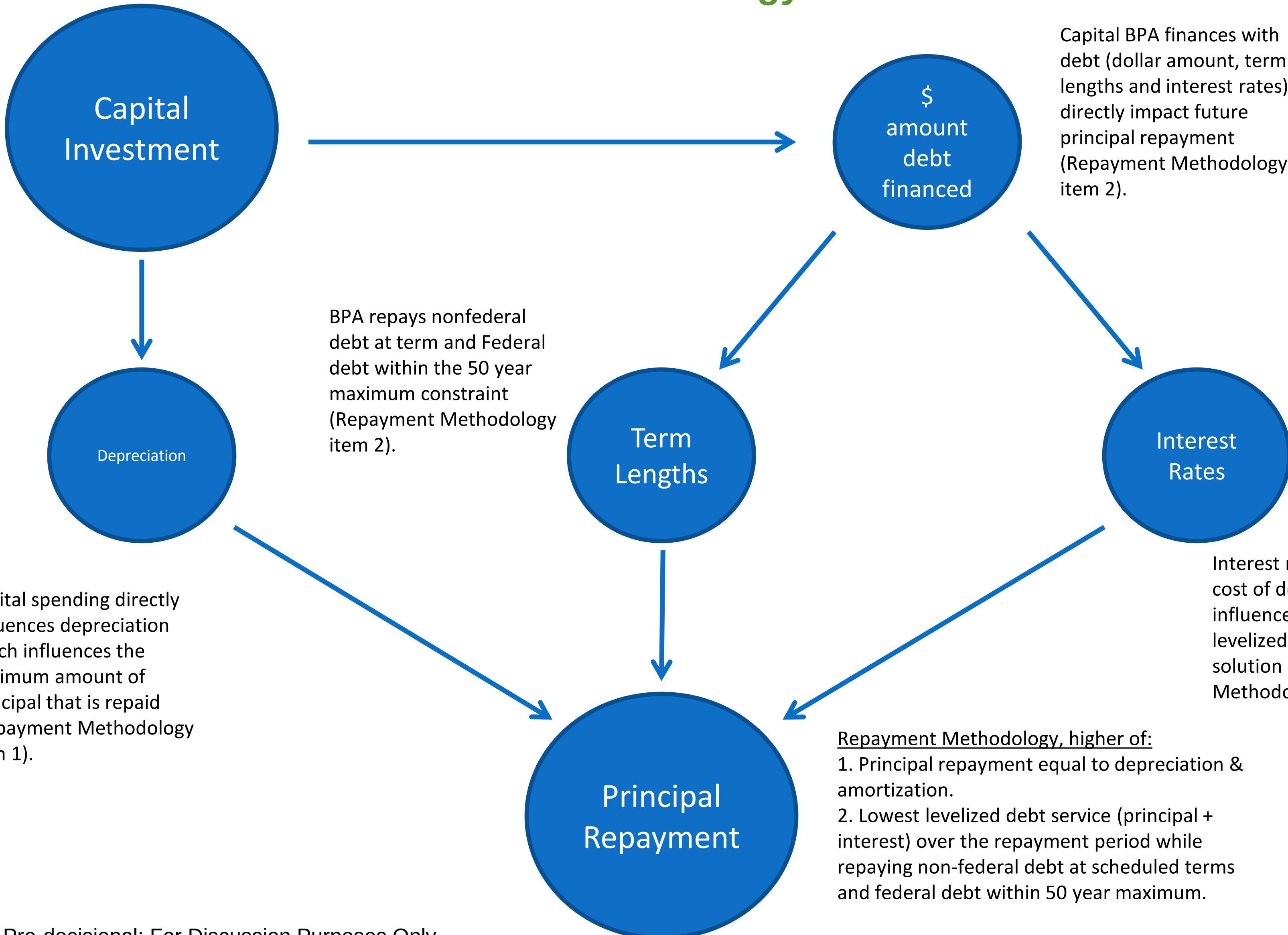
	Increased Debt Repayment ($000s)			
		Q2	**BP-18**	**BP-18**
	Debt	**FY17**	**FY18**	**FY19**
1	Starting Debt	5,502,414	5,572,000	5,771,677
2	New Debt	499,849	507,135	523,687
3	Amount Revenue Financed	-	-	-
4	Capital Reductions	-	-	-
5	Repayment	(298,207)	(241,283)	(252,319)
6	Increased Debt Repayment	-	(66,175)	(66,175)
7	Total Debt	5,572,000	5,771,677	5,976,870
	Assets			
8	Starting Plant	6,926,062	6,993,400	7,244,562
9	New Plant	499,849	522,135	538,687
10	Reductions to Capital Investment	-	-	-
11	Depreciation	(257,415)	(270,973)	(282,159)
12	Adjustments	-	-	-
13	Net Utility Plant	6,993,400	7,244,562	7,501,090
14	Debt to Asset Ratio	79.68%	79.67%	79.68%

Ratio is the same

	Revenue Financing ($000s)			
		Q2	**BP-18**	**BP-18**
	Debt	**FY17**	**FY18**	**FY19**
1	Starting Debt	5,502,414	5,572,000	5,771,677
2	New Debt	499,849	507,135	523,687
3	Amount Revenue Financed	-	(66,175)	(66,175)
4	Capital Reductions	-	-	-
5	Repayment	(298,207)	(241,283)	(252,319)
6	Increased Debt Repayment	-		
7	Total Debt	5,572,000	5,771,677	5,976,870
	Assets			
8	Starting Plant	6,926,062	6,993,400	7,244,562
9	New Plant	499,849	522,135	538,687
10	Reductions to Capital Investment	-	-	-
11	Depreciation	(257,415)	(270,973)	(282,159)
12	Adjustments	-	-	-
13	Net Utility Plant	6,993,400	7,244,562	7,501,090
14	Debt to Asset Ratio	79.68%	79.67%	79.68%

Ratio is the same

Variables impacting principal repayment under the repayment methodology



Capital BPA finances with debt (dollar amount, term lengths and interest rates) directly impact future principal repayment (Repayment Methodology item 2).

BPA repays nonfederal debt at term and Federal debt within the 50 year maximum constraint (Repayment Methodology item 2).

Capital spending directly influences depreciation which influences the minimum amount of principal that is repaid (Repayment Methodology item 1).

Interest rates impact the cost of debt and thus influence the lowest levelized debt service solution (Repayment Methodology item 2).

<u>Repayment Methodology, higher of:</u>

1. Principal repayment equal to depreciation & amortization.
2. Lowest levelized debt service (principal + interest) over the repayment period while repaying non-federal debt at scheduled terms and federal debt within 50 year maximum.

Power scenario analysis – Capital and interest rate sensitivities

1. Base Case - Power BP18 Final Proposal

	18/19	20/21	22/23	24/25	26/27/28	$ Change
Principal Repayment	$536m	$509m	$565m	$588m	$602m	$66m
Interest Repayment	$352m	$342m	$341m	$341m	$338m	-$14m
Debt Ratio	94.44%	93.16%	92.21%	88.47%	81.67%	$0m
Debt Ratio Change	N/A	-1.3%	-0.96%	-3.7%	-6.8%	N/A

2. Base Case + $50m Capital

	18/19	20/21	22/23	24/25	26/27/28	$ Change
Principal Repayment	$536m	$510m	$566m	$591m	$605m	$69m
Interest Repayment	$352m	$344m	$348m	$352m	$355m	$3m
Debt Ratio	94.44%	93.22%	92.36%	88.80%	82.38%	$0m
Debt Ratio Change	N/A	-1.21%	-0.87%	-3.56%	-6.42%	N/A

Delta from Base Case

	18/19	20/21	22/23	24/25	26/27/28	$ Change
Principal Repayment	$0m	$1m	$1m	$2m	$3m	$3m
Interest	$0m	$2m	$7m	$12m	$17m	$17m
Debt Ratio	0.00%	0.06%	0.15%	0.33%	0.71%	$0m
Rate Debt Ratio Change	N/A	$0m	$0m	$0m	$0m	N/A

3. Base Case + 1% change in interest rates

	18/19	20/21	22/23	24/25	26/27/28	$ Change
Principal Repayment	$536m	$510m	$566m	$590m	$592m	$57m
Interest Repayment	$352m	$345m	$350m	$357m	$365m	$12m
Debt Ratio	94.44%	93.16%	92.18%	88.42%	81.87%	$0m
Debt Ratio Change	N/A	-1.28%	-0.98%	-3.76%	-6.55%	N/A

	18/19	20/21	22/23	24/25	26/27/28	$ Change
Principal Repayment	$0m	$0m	$1m	$1m	-$9m	-$9m
Interest	$0m	$3m	$9m	$17m	$27m	$27m
Debt Ratio	0.00%	-0.01%	-0.03%	-0.05%	0.20%	$0m
Rate Debt Ratio Change	N/A	$0m	$0m	$0m	$0m	N/A

4. Base Case + reduction in planned principal payments that would result in not meeting debt-to-asset ratio goals

	18/19	20/21	22/23	24/25	26/27/28	$ Change
Principal Repayment	$536m	$462m	$517m	$541m	$554m	$19m
Interest Repayment	$352m	$345m	$348m	$352m	$355m	$2m
Debt Ratio	94.44%	94.10%	94.08%	91.17%	85.39%	$0m
Debt Ratio Change	N/A	-0.34%	-0.01%	-2.91%	-5.78%	N/A

	18/19	20/21	22/23	24/25	26/27/28	$ Change
Principal Repayment	$0m	-$48m	-$48m	-$48m	-$48m	-$48m
Interest	$0m	$3m	$7m	$12m	$17m	$17m
Debt Ratio	0.00%	0.93%	1.88%	2.70%	3.72%	$0m
Rate Debt Ratio Change	N/A	$0m	$0m	$0m	$0m	N/A

Note: dollar figures represent average annual rate period amount, debt ratio represents end of rate period amount

- These tables highlight the sensitivity of capital spending and interest rates on Power's debt-to-asset ratio – in contrast to Transmission, based on current policies and practices, Power is on a path to meet the leverage policy goals and will not need to take additional action to meet these goals.
- Highlights:
  - Roughly $600m change in capital spending (assuming it is all debt financed) results in a 1% change in the debt-to-asset ratio.
  - Interest rate changes have minimal effect on the debt-to-asset ratio.
  - Scenario 4 shows simply the reduction in principal payments that would result in not meeting debt-to-asset ratio goals, roughly $48m/yr from 2020-2028.

Transmission scenario analysis

1. Base Case - BP18 Transmission Final Proposal

	18/19	20/21	22/23	24/25	26/27/28	$ Change
Principal Repayment	$247m	$265m	$291m	$309m	$341m	$94m
Interest Repayment	$156m	$203m	$245m	$279m	$317m	$161m
Debt Ratio	81.45%	83.55%	85.14%	86.67%	88.62%	$0m
% Cost Change*	N/A	6.4%	6.4%	4.5%	5.9%	N/A

2. Base Case + keep leverage flat with additional revenue financing

	18/19	20/21	22/23	24/25	26/27/28	$ Change
Principal Repayment	$247m	$351m	$370m	$392m	$425m	$178m
Interest Repayment	$156m	$197m	$232m	$259m	$288m	$131m
Debt Ratio	81.45%	81.45%	81.45%	81.45%	81.45%	$0m
% Cost Change*	N/A	14.4%	4.7%	4.0%	4.9%	N/A

Delta from Base Case

	18/19	20/21	22/23	24/25	26/27/28	Sum Total
Principal Repayment**	$0m	$87m	$79m	$84m	$84m	$750m
Interest Repayment	$0m	-$6m	-$13m	-$20m	-$30m	-$168m
Debt Ratio	0.00%	-2.10%	-3.69%	-5.22%	-7.17%	N/A
% Cost Change*	N/A	8.0%	-1.7%	-0.5%	-1.1%	N/A

3. Base Case + reduce capital spending $50m/yr + keep leverage flat with additional revenue financing

	18/19	20/21	22/23	24/25	26/27/28	$ Change
Principal Repayment	$247m	$342m	$361m	$383m	$415m	$168m
Interest Repayment	$156m	$195m	$226m	$249m	$273m	$117m
Debt Ratio	81.45%	81.45%	81.45%	81.45%	81.45%	$0m
% Cost Change*	N/A	13.3%	4.4%	3.8%	4.5%	N/A

Delta from Base Case

	18/19	20/21	22/23	24/25	26/27/28	Sum Total
Principal Repayment**	$0m	$77m	$70m	$74m	$74m	$666m
Interest Repayment	$0m	-$8m	-$19m	-$30m	-$44m	-$246m
Debt Ratio	0.00%	-2.10%	-3.69%	-5.22%	-7.16%	N/A
% Cost Change*	N/A	6.9%	-2.0%	-0.7%	-1.4%	N/A

* % Cost Change represents the percentage change in the rate period average revenue requirement from one rate period to the next - assumes 18/19 average IPR costs of $604m are constant across all years, adds to those costs the rate period average principal and interest amounts shown here to get the average revenue requirement per rate period - divide the % Cost Change by the number of years in the rate period to get roughly the annual percentage increase

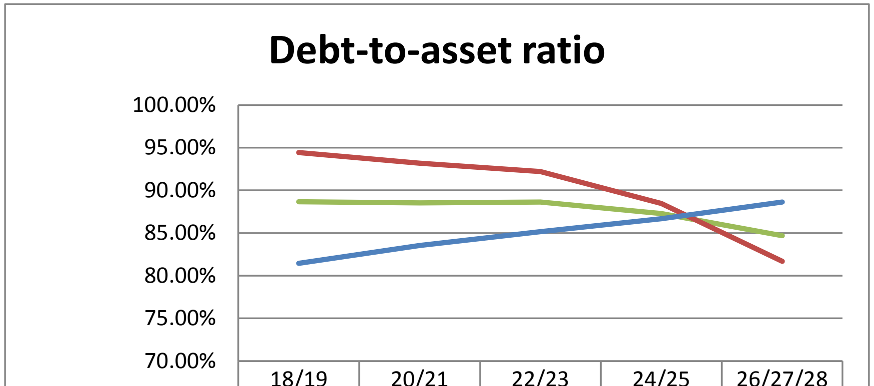
Note: dollar figures represent average annual rate period amount, debt ratio represents end of rate period amount

**Equivalent to amount of revenue financing

- These tables highlight the sensitivity of revenue financing and capital spending on Transmission's debt-to-asset ratio – they also provide a rough estimate of the revenue requirement impacts (more scenarios in the appendix).
- Highlights:
  - All three scenarios show principal and interest going up in all years – even though leverage is held flat in the 2nd and 3rd scenario, fixed costs continue to grow.
  - Roughly $95 million per year in revenue financing results in a 1% change in the debt ratio.
  - It takes roughly 10x the amount of change in capital spending to create the same effect.
  - *In the 3rd workshop, BPA will show scenarios that phase-in, that reduce the debt-to-asset ratio towards the long-term targets and other alternatives based on comments and feedback from customers.*

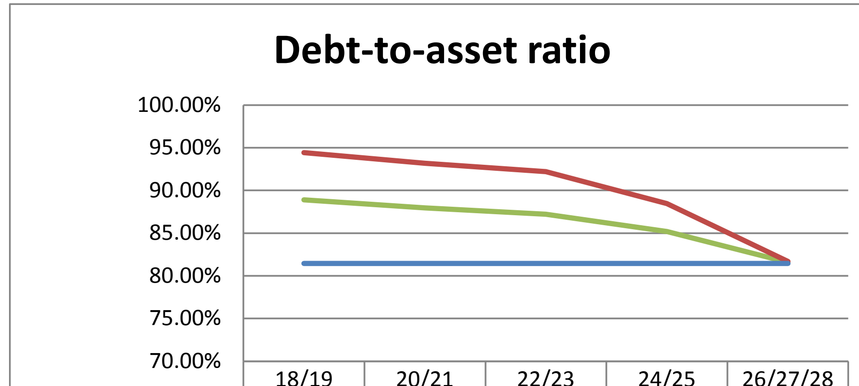
Financial metrics and highlights

Power and Transmission Base Case



	18/19	20/21	22/23	24/25	26/27/28
Agency	88.67%	88.52%	88.62%	87.27%	84.67%
Power	94.44%	93.16%	92.21%	88.47%	81.67%
Transmission	81.45%	83.55%	85.14%	86.67%	88.62%

Example Scenario: Power Base Case, Transmission Scenario 3

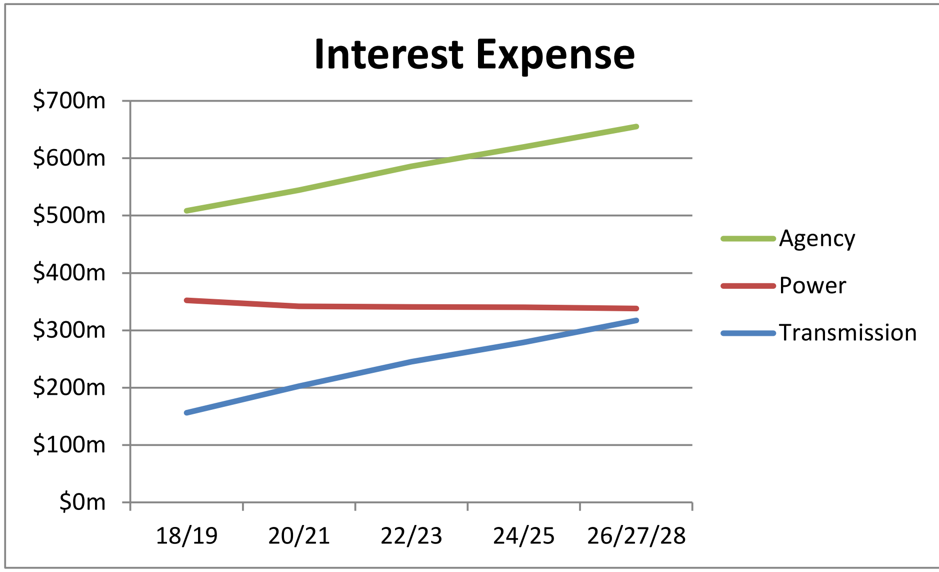


	18/19	20/21	22/23	24/25	26/27/28
Agency	88.91%	87.95%	87.20%	85.19%	81.57%
Power	94.44%	93.16%	92.21%	88.47%	81.67%
Transmission	81.45%	81.45%	81.45%	81.45%	81.45%

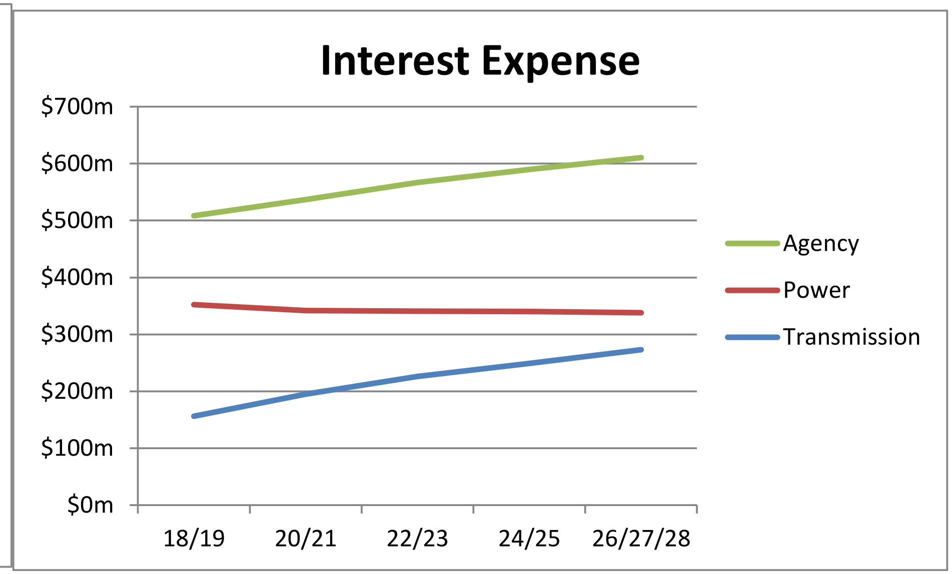
- Power's leverage declines based on meeting minimum repayment methodology requirements, Transmission's increases, increasing future fixed costs and taking from limited remaining borrowing authority.
- Under the example scenario in the right-hand graph, Power, Transmission, and the Agency meet stated leverage policy goals.
- Reducing the leverage of each business line and the agency supports BPA's long term financial health.

Financial metrics and highlights

Power and Transmission Base Case

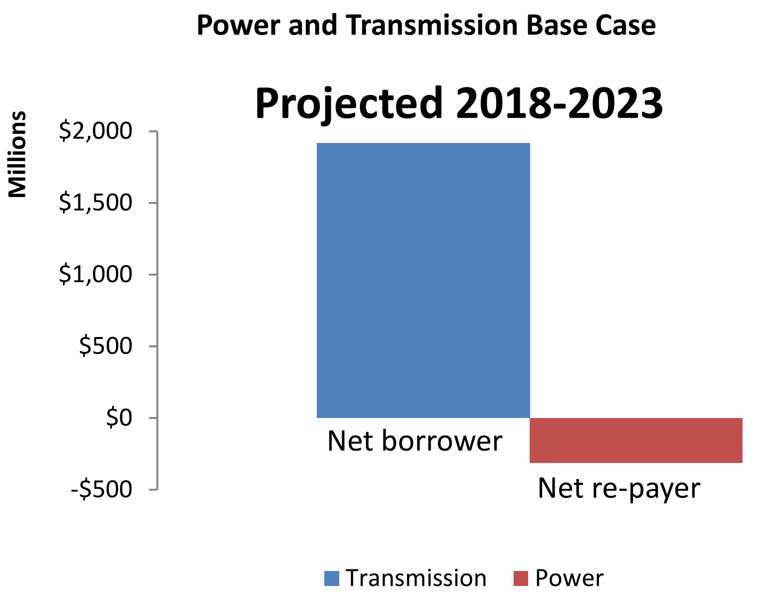


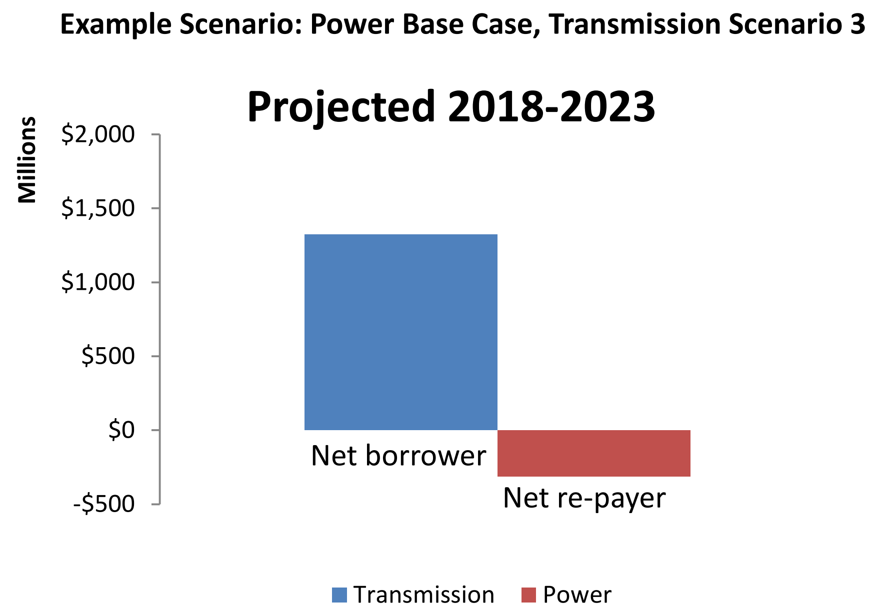
Example Scenario: Power Base Case, Transmission Scenario 3



- Under the example scenario in the right-hand graph, interest expense continues to increase for Transmission relative to the base case, however at a slower rate.
- Interest expense decreases modestly for Power due to being a slight net re-payer of debt over the forecast period.

Financial metrics and highlights





- Under the example scenario in the right-hand graph, Transmission preserves an additional ~$500 million of borrowing authority compared to the base case through a combination of revenue financing a portion of its capital program and reducing its capital spending, which further reduces its use of debt – both of which preserve borrowing authority.

*Details of the example scenario can be found on slide 9 for Power under Power base case and on slide 10, scenario 3 for Transmission

Next steps

- BPA is seeking public comments or questions by April 6 on:
  1. Materials and concepts discussed.
  2. Possible alternatives.
  3. Request for additional information or analysis.
- Comments or questions should be submitted to BPAFinance@bpa.gov.
- BPA plans to present its draft Leverage Policy at the April 20 workshop. The meeting will include:
  – BPA's draft leverage policy proposal and forecast results.
  – Alternative proposals and forecast results based on customer feedback.
  – BPA response to public comments or request for additional analysis.

Appendix

Additional Repayment Sensitivities

Power

1. Base Case - Power BP18 Final Proposal

	18/19	20/21	22/23	24/25	26/27/28	$ Change
Principal Repayment	$536m	$509m	$565m	$588m	$602m	$66m
Interest Repayment	$352m	$342m	$341m	$341m	$338m	-$14m
Debt Ratio	94.44%	93.16%	92.21%	88.47%	81.67%	$0m
Debt Ratio Change	N/A	-1.3%	-0.96%	-3.7%	-6.8%	N/A

5. Base Case + -$50m Capital

Principal Repayment	$536m	$509m	$563m	$586m	$599m	$63m
Interest Repayment	$352m	$339m	$334m	$329m	$321m	-$32m
Debt Ratio	94.44%	93.10%	92.05%	88.13%	80.91%	$0m
Debt Ratio Change	N/A	-1.34%	-1.05%	-3.92%	-7.21%	N/A

Delta from Base Case

Principal Repayment	$0m	-$1m	-$1m	-$2m	-$3m	-$3m
Interest Repayment	$0m	-$2m	-$7m	-$12m	-$17m	-$17m
Debt Ratio	0.00%	-0.06%	-0.16%	-0.35%	-0.76%	$0m
Rate Debt Ratio Change	N/A	$0m	$0m	$0m	$0m	N/A

6. Base Case + -1% change in interest rates

Principal Repayment	$536m	$508m	$558m	$584m	$615m	$79m
Interest Repayment	$352m	$339m	$332m	$324m	$311m	-$41m
Debt Ratio	94.44%	93.20%	92.38%	88.71%	81.55%	$0m
Debt Ratio Change	N/A	-1.24%	-0.82%	-3.67%	-7.16%	N/A

Principal Repayment	$0m	-$2m	-$7m	-$4m	$13m	$13m
Interest Repayment	$0m	-$3m	-$9m	-$16m	-$27m	-$27m
Debt Ratio	0.00%	0.03%	0.17%	0.24%	-0.12%	$0m
Rate Debt Ratio Change	N/A	$0m	$0m	$0m	$0m	N/A

Note: dollar figures represent average annual rate period amount, debt ratio represents end of rate period amount

Additional Repayment Sensitivities

Transmission

1. Base Case - BP18 Transmission Final Proposal

	18/19	20/21	22/23	24/25	26/27/28	$ Change
Principal Repayment	$247m	$265m	$291m	$309m	$341m	$94m
Interest Repayment	$156m	$203m	$245m	$279m	$317m	$161m
Debt Ratio	81.45%	83.55%	85.14%	86.67%	88.62%	$0m
% Cost Change*	N/A	6.4%	6.4%	4.5%	5.9%	N/A

4. Base Case + $50m/yr Capital

Principal Repayment	$247m	$266m	$293m	$313m	$348m	$102m
Interest Repayment	$156m	$211m	$260m	$293m	$333m	$176m
Debt Ratio	81.45%	83.71%	85.38%	86.90%	88.73%	$0m
% Change	N/A	7.3%	7.0%	4.6%	6.2%	N/A

Delta from Base Case

Principal Repayment**	$0m	$1m	$3m	$5m	$7m	$39m
Interest Repayment	$0m	$8m	$14m	$14m	$15m	$118m
Debt Ratio	0.00%	0.16%	0.24%	0.23%	0.11%	N/A
% Change	N/A	1.0%	0.6%	0.1%	0.2%	N/A

5. Base Case + -$50m/yr Capital

Principal Repayment	$247m	$264m	$288m	$304m	$334m	$87m
Interest Repayment	$156m	$200m	$238m	$268m	$301m	$145m
Debt Ratio	81.45%	83.36%	84.88%	86.41%	88.48%	$0m
% Change	N/A	6.1%	5.8%	4.0%	5.3%	N/A

Delta from Base Case

Principal Repayment	$0m	-$1m	-$3m	-$5m	-$7m	-$38m
Interest Repayment	$0m	-$2m	-$7m	-$11m	-$17m	-$91m
Debt Ratio	0.00%	-0.19%	-0.26%	-0.26%	-0.13%	N/A
% Change	N/A	-0.3%	-0.6%	-0.5%	-0.6%	N/A

* % Cost Change represents the percentage change in the rate period average revenue requirement from one rate period to the next - assumes 18/19 average IPR costs of $604m are constant across all years, adds to those costs the rate period average principal and interest amounts shown here to get the average revenue requirement per rate period - divide the % Cost Change by the number of years in the rate period to get roughly the annual percentage increase

Note: dollar figures represent average annual rate period amount, debt ratio represents end of rate period amount

Additional Repayment Sensitivities

Transmission Continued

1. Base Case - BP18 Transmission Final Proposal

	18/19	20/21	22/23	24/25	26/27/28	$ Change
Principal Repayment	$247m	$265m	$291m	$309m	$341m	$94m
Interest Repayment	$156m	$203m	$245m	$279m	$317m	$161m
Debt Ratio	81.45%	83.55%	85.14%	86.67%	88.62%	$0m
% Cost Change*	N/A	6.4%	6.4%	4.5%	5.9%	N/A

Delta from Base Case

6. Base Case + 1% change in interest rates

Principal Repayment	$247m	$266m	$291m	$309m	$341m	$94m
Interest Repayment	$156m	$207m	$259m	$301m	$350m	$193m
Debt Ratio	81.45%	83.52%	85.11%	86.65%	88.59%	$0m
% Change	N/A	7.0%	7.1%	5.2%	6.7%	N/A

Principal Repayment	$0m	$1m	$0m	$0m	$0m	$3m
Interest Repayment	$0m	$5m	$14m	$22m	$32m	$179m
Debt Ratio	0.00%	-0.03%	-0.03%	-0.03%	-0.02%	N/A
% Change	N/A	0.6%	0.7%	0.6%	0.7%	N/A

7. Base Case + -1% change in interest rates

Principal Repayment	$247m	$264m	$291m	$309m	$341m	$95m
Interest Repayment	$156m	$196m	$228m	$254m	$283m	$127m
Debt Ratio	81.45%	83.58%	85.17%	86.70%	88.63%	$0m
% Change	N/A	5.6%	5.6%	3.8%	5.4%	N/A

Principal Repayment	$0m	-$1m	$0m	$0m	$0m	-$2m
Interest Repayment	$0m	-$7m	-$17m	-$26m	-$34m	-$200m
Debt Ratio	0.00%	0.03%	0.03%	0.02%	0.02%	N/A
% Change	N/A	-0.8%	-0.8%	-0.7%	-0.6%	N/A

* % Cost Change represents the percentage change in the rate period average revenue requirement from one rate period to the next - assumes 18/19 average IPR costs of $604m are constant across all years, adds to those costs the rate period average principal and interest amounts shown here to get the average revenue requirement per rate period - divide the % Cost Change by the number of years in the rate period to get roughly the annual percentage increase

Note: dollar figures represent average annual rate period amount, debt ratio represents end of rate period amount

Historical debt-to-asset ratio calculation

(Federal debt + nonfederal debt)/(Net utility plant + nonfederal generation)

$ in millions — FY 2017

FCRPS	Debt	Assets
Net utility plant		13,426
Nonfederal generation		3,519
Federal appropriations	2,029	
Borrowings from U.S. Treasury	5,009	
Nonfederal debt	8,262	
Total	15,300	16,944
Debt-to-asset ratio:	90 percent	

$ in millions — FY 2017

Power	Debt	Assets
Net utility plant		6,377
Nonfederal generation		3,519
Federal appropriations	2,022	
Borrowings from U.S. Treasury	1,940	
Nonfederal debt	5,766	
Total	9,728	9,896
Debt-to-asset ratio:	98 percent	

$ in millions — FY 2017

Transmission	Debt	Assets
Net utility plant		7,048
Nonfederal generation		
Federal appropriations	7	
Borrowings from U.S. Treasury	3,068	
Nonfederal debt	2,497	
Total	5,572	7,048
Debt-to-asset ratio:	79 percent	

Example of forecast debt-to-asset ratio calculation

(Total debt)/(Total revenue producing assets)

Transmission Example			
	2017*	2018**	2019**
Debt			
New Borrowing		490,808	506,577
Repayment		(241,284)	(252,320)
Total Debt	5,572,491	5,822,015	6,076,272
Assets			
Capital		505,808	521,577
Depreciation		(273,164)	(284,422)
Net Utility Plant	7,048,335	7,226,088	7,463,243
Debt-to-asset ratio (Total Debt/ Net Utility Plant)	**79.1%**	**80.6%**	**81.4%**

*end of year FY17 annual report and debt pie chart

** BP-18 Transmission revised revenue test