



FTR Credit Enhancements

Credit Subcommittee
Bridgid Cummings
March 14, 2018

- Data gathered for four planning years
 - 13/14, 14/15, 15/16, 16/17
 - 16/17 planning year used for initial analysis
- Goal is to maximize the reduction in collateral shortfall while minimizing the increase in collateral excess
- Analysis includes all positions in the planning year
 - Annual, monthly and long-term FTRs Obligations, and ARRAs
 - Shows actual total exposure to PJM membership

- Collateral excess and shortfall are measured by account on a runout (“to go”) basis
 - Equal to remaining collateral requirement minus remaining actual net loss (if any)
- Excess is the smallest positive difference
- Shortfall is the largest negative difference
- Accounts will have either a shortfall or an excess in a given year
- PJM looked at total excesses and shortfalls across all accounts for each scenario

Example Account A: \$10,000 Shortfall

Month	Monthly Credit Requirement	Monthly Profit / (Loss)	Run-Out Credit Requirement	Run-Out Profit / (Loss)	Excess/ (Shortfall)
Jun	\$10,000	\$5,000	\$120,000	(\$40,000)	\$80,000
Jul	\$10,000	\$5,000	\$110,000	(\$45,000)	\$65,000
Aug	\$10,000	\$5,000	\$100,000	(\$50,000)	\$50,000
Sep	\$10,000	\$5,000	\$90,000	(\$55,000)	\$35,000
Oct	\$10,000	\$5,000	\$80,000	(\$60,000)	\$20,000
Nov	\$10,000	\$5,000	\$70,000	(\$65,000)	\$5,000
Dec	\$10,000	(\$20,000)	\$60,000	(\$70,000)	<u>(\$10,000)</u>
Jan	\$10,000	(\$20,000)	\$50,000	(\$50,000)	\$0
Feb	\$10,000	(\$20,000)	\$40,000	(\$30,000)	\$10,000
Mar	\$10,000	(\$20,000)	\$30,000	(\$10,000)	\$20,000
Apr	\$10,000	\$5,000	\$20,000	\$10,000	\$20,000
May	\$10,000	\$5,000	\$10,000	\$5,000	\$10,000

Example Account B: \$10,000 Excess

Month	Monthly Credit Requirement	Monthly Profit / (Loss)	Run-Out Credit Requirement	Run-Out Profit / (Loss)	Excess/ (Shortfall)
Jun	\$10,000	\$5,000	\$120,000	(\$20,000)	\$100,000
Jul	\$10,000	\$5,000	\$110,000	(\$25,000)	\$85,000
Aug	\$10,000	\$5,000	\$100,000	(\$30,000)	\$70,000
Sep	\$10,000	\$5,000	\$90,000	(\$35,000)	\$55,000
Oct	\$10,000	\$5,000	\$80,000	(\$40,000)	\$40,000
Nov	\$10,000	\$5,000	\$70,000	(\$45,000)	\$25,000
Dec	\$10,000	(\$20,000)	\$60,000	(\$50,000)	<u>\$10,000</u>
Jan	\$10,000	(\$20,000)	\$50,000	(\$30,000)	\$20,000
Feb	\$10,000	(\$20,000)	\$40,000	(\$10,000)	\$30,000
Mar	\$10,000	\$0	\$30,000	\$10,000	\$30,000
Apr	\$10,000	\$5,000	\$20,000	\$10,000	\$20,000
May	\$10,000	\$5,000	\$10,000	\$5,000	<u>\$10,000</u>

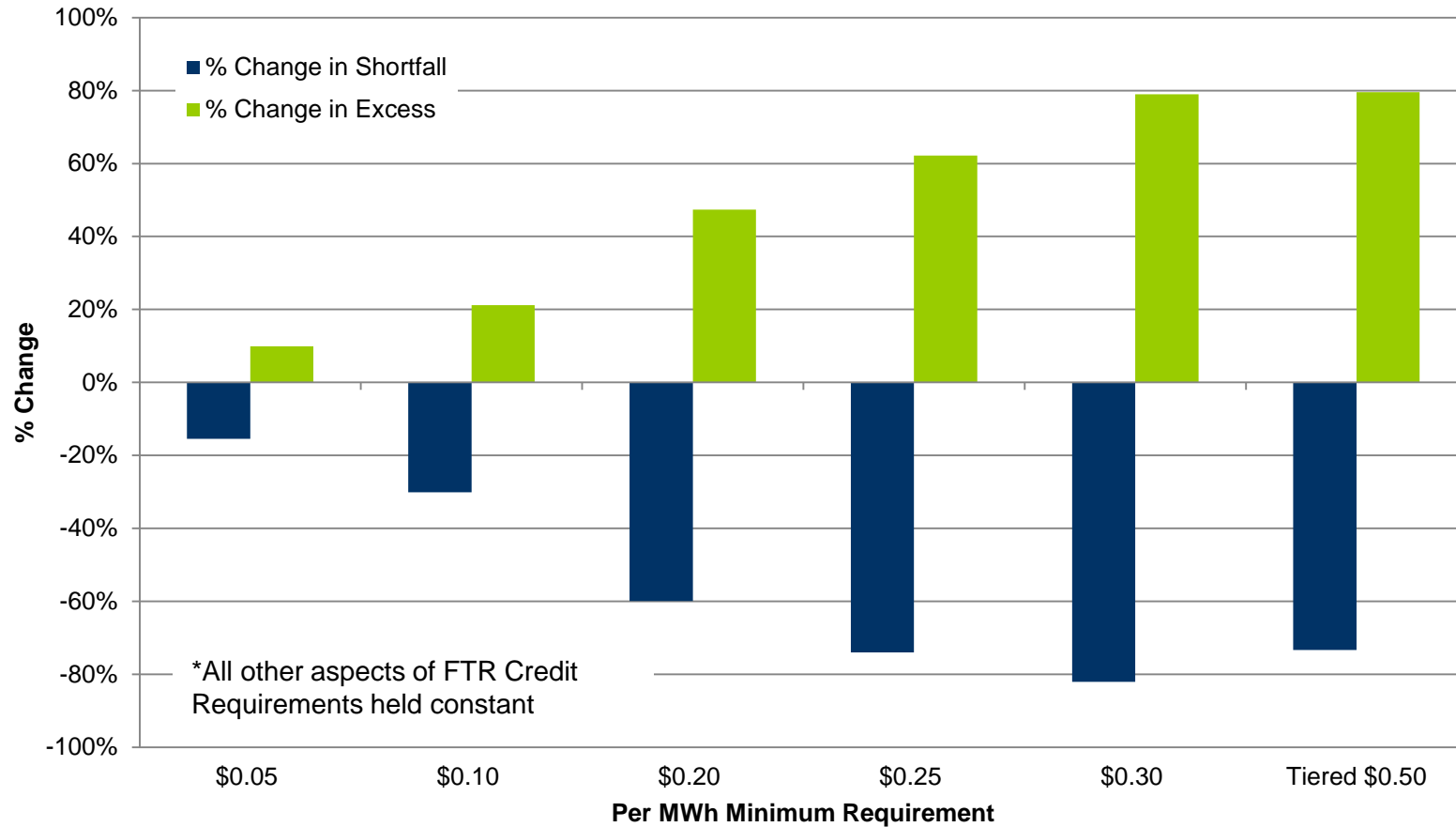
- Factors analyzed for possible adjustments to the credit calculation
 - Per MWh Minimum Requirements (applied monthly)
 - Flat rate
 - Tiered
 - Undiversified Adder Deductible
 - Prevailing and Counter Flow Historical Value Adjustments
- PJM looked at each individually, as well as scenarios using different combinations of these factors

- Per MWh Minimum Requirement
 - Single adder in single increments
 - \$0.05, \$0.10, \$0.20, \$0.25, and \$0.30 per MWh
 - Tiered approach analyzed*:

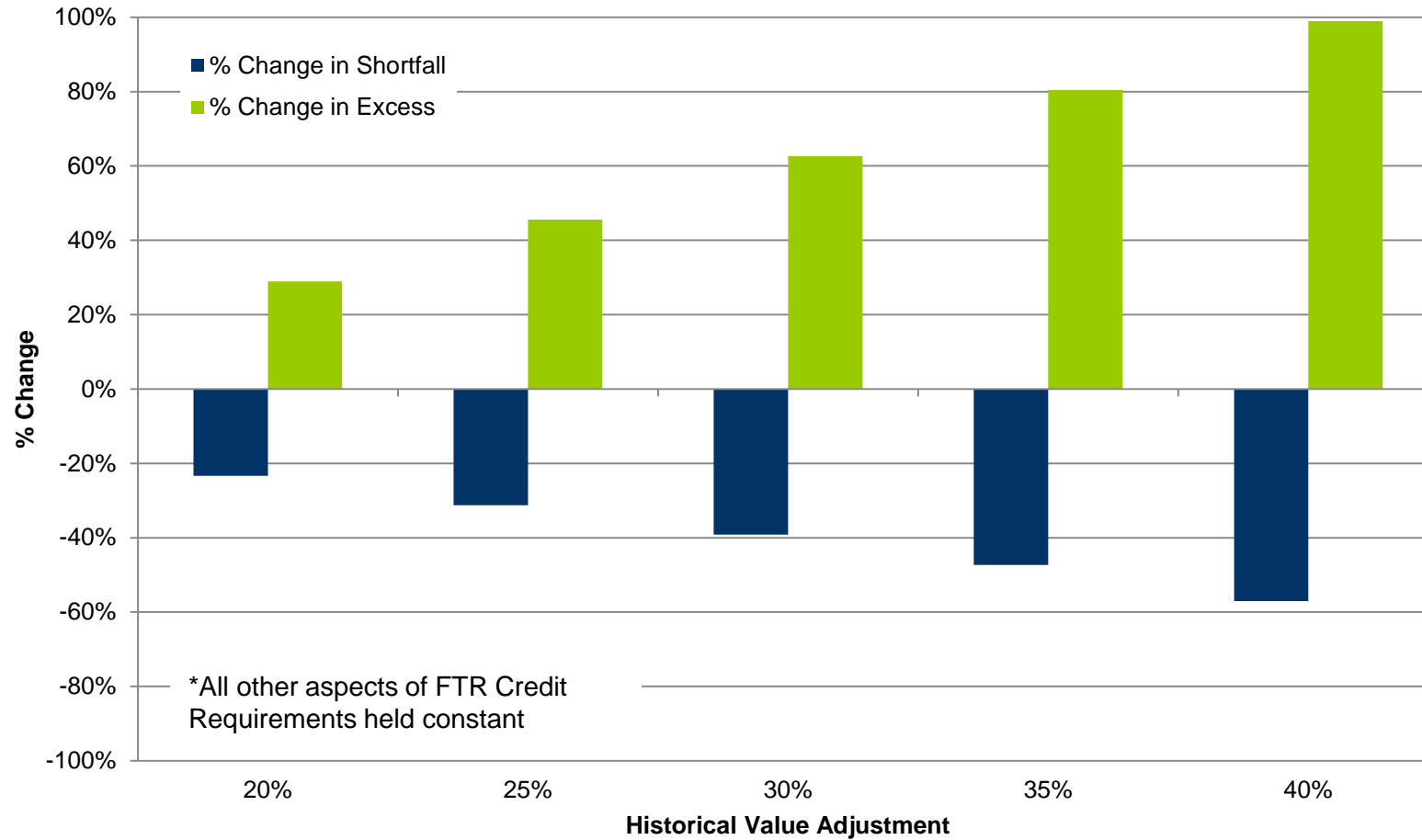
Cleared MWh	Marginal Credit Rate
	\$0.50 Tiered*
First 1MM MWh/Mo	\$0.50/MWh
1 MM – 10 MM MWh/Mo	\$0.25/MWh
10 MM – 100 MM MWh/Mo	\$0.10/MWh
Above 100 MM MWh/Mo	\$0.01/MWh

* Stakeholder proposal

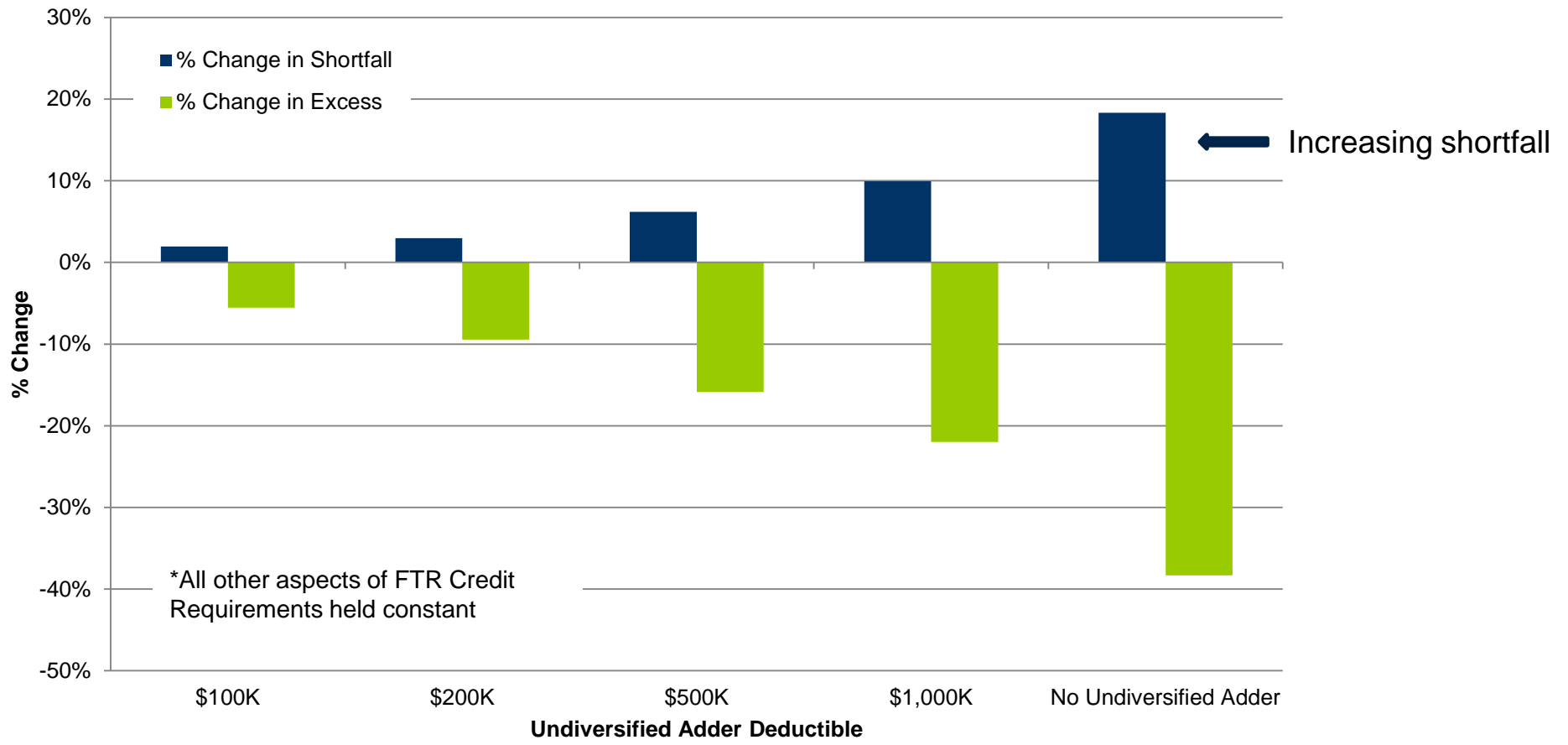
Per MWh Minimum Requirement Scenarios 16/17 Planning Period - All FTR Obligations and ARR



Historical Value Adjustment Scenarios 16/17 Planning Period - All FTR Obligations and ARR



Undiversified Adder Deductible Scenarios 16/17 Planning Period - All FTR Obligations and ARR's



Results of select mixed case scenarios 16/17 Planning Period - All FTR Obligations and ARR

Counter Flow Adjustment	Prevailing Flow Adjustment	Undiversified Deductible	Per MWh Min	% Shortfall Reduction	% Excess Increase
10%	10%	\$500K	Tiered \$0.50	71%	70%
10%	10%	\$500K	\$0.25	71%	51%
20%	20%	\$100K	\$0.20	67%	66%
10%	10%	\$1,000K	\$0.20	54%	31%
10%	10%	\$500K	\$0.10	26%	7%

- Investigate volatility measures and applicability to credit requirements
- Perform stress testing
- Consider incorporating Options
- Consider procedural implementation
- Consider Mark-to-Market