



Item 4: Periodic Report on Credit Work Group Activity

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Finance & Audit Committee Meeting

ERCOT Public

October 8, 2018

Credit Work Group Update – Reviewed NPRRs

- **NPRRs Reviewed Without Credit Impact**
 - NPRR 869 - Clarification of Language Related to Generation Netting for ERCOT-Polled Settlement Meters
 - NPRR 879 - SCED Base Point, Base Point Deviation, and Performance Evaluation Changes for IRRs that Carry Ancillary Services
 - NPRR 880 - Publish Real-Time Market Shift Factors for Private Use Network Settlement Points.
 - NPRR 881 - Annual Validation Process Revisions
 - NPRR 887 - Monthly Posting of Default Uplift Exposure Information
 - NPRR 888 - 4-Coincident Peak Adjustment Methodology
 - NPRR 889 - RTF-1 Replace Non-Modeled Generator with Settlement Only Generator
 - NPRR 894 - Correction of Unaccounted For Energy (UFE) Formula
- **NPRRs with Positive Credit Impact (improve settlement accuracy)**
 - NPRR 883 - Adjustment to Settlement Equation for Ancillary Services Assignment
 - NPRR 890 - Correction to Calculation of Real-Time LMPs at Logical Resource Node for On-Line Combined Cycle Generation Resources
 - NPRR 895 - Inclusion of Photo-Voltaic Generation Resources (PVGRs) in Real-Time Ancillary Service Imbalance Payment or Charge

NPRR 850 – Market Suspension and Restart

- ERCOT employed stakeholder feedback to develop a principles-based approach to Market Suspension and Market Restart.
- ERCOT has drafted proposed language to handle collateral requests during the transition from pre-to post-market restart.
 - Based upon feedback from the CWG, ERCOT has added discretionary language to allow up to two additional days for Market Participants to make payment on any outstanding invoices / collateral calls during a market restart
- Currently NPRR 850 is tabled at PRS and referred to WMS to discuss comments filed by LCRA.
- Credit Work Group is awaiting further comments or feedback from other ERCOT stakeholder working groups prior to filing additional comments.

Discussion will continue at an upcoming CWG/MCWG meeting.

Letter of Credit (LC) Update

- Currently any institution which has reached its concentration limit may not supply an new LC to an ERCOT market participant, however any existing LC holder may amend/increase their LC with that financial institution during a 4 month amendment window without limit.
- ERCOT is considering drafting an NPRR to restrict the current 4 month amendment window in the case of a credit concentration limit being breached due to a downgrade in a financial institution's credit.
 - For example, Bank X has a \$300 million LC limit and market participants have established LCs with that Bank for a total of \$250 million outstanding. If Bank X's credit rating were to fall to a level that ERCOT would only grant a \$200 million LC limit and market participants currently have an aggregate of \$250 million outstanding, no new LCs – including increases to currently established LCs – would be allowed.

Surety Bond Limit Update

- ERCOT protocols currently restrict Surety Bonds to a limit of \$10 million per Counter-Party per insurer and an overall limit of \$100 million per insurer for all ERCOT Counter-Parties.
- The surety bond must be issued by an insurance company with a minimum rating of A- with S&P or Fitch or A3 with Moody's.
- The \$10 million per Counter-Party / \$100 million overall limit has been in effect for at least ten years and is significantly lower than the maximum \$750 million overall limit (based upon the issuer's financial capacity) for Letter of Credit Issuers (with no specific per Counter-Party limit).
- The Credit Work Group would be amenable to changes to the Surety Bond limits and credit rating requirement to bring them more in line with those pertaining to Letter of Credit issuers but believe this should be a Market Participant sponsored initiative (NPRR) instead of being sponsored by the CWG.

Review of ERCOT NPRR 800 Collateral Parameters

- No recommended changes at this time

Parameter	Parameter Value
Electricity-Futures Based Factors (RFAF & DFAF) Parameters	
Number of Forward Weeks	3 weeks
Real-Time Weight Factors for Forward Week (RWF) <ul style="list-style-type: none"> • Week 1 • Week 2 • Week 3 	1/3 1/3 1/3
Day-Ahead Weight Factors for Forward Week (DWF) <ul style="list-style-type: none"> • Week 1 • Week 2 • Week 3 	1/3 1/3 1/3
Reference Hub (rHub)	ERCOT North Hub
M1 (Multiplier for RTLE and DALE) Parameters	
<ul style="list-style-type: none"> • M1a (no. of days for termination upon default) • M1b (minimum no. of days to transition; based on no. of ESI IDs) <ul style="list-style-type: none"> ➢ ESI ID daily transition rate (to determine no. of days to transition) 	12 8 100,000
RTLE Look-Back <ul style="list-style-type: none"> • No Load or Gen (NPRR 620; for implementation) • All Others 	20 40

M1a / M1b – Number of Days in a Mass Transition

- Draft NPRR to reflect ‘actual forward banking days’

	Best Case	Worst Case	Day	Q1		Q2		Q3		Q4	
				Best case	Worst case	Best case	Worst case	Best case	Worst case	Best case	Worst case
Initial transaction	M1a	M1a	1	(Mon.)	(Thur.)	(Mon.)	(Thur.)	(Mon.)	(Thur.)	(Mon.)	(Tue.)
Collateral call issuance			2	(Tue.)	(Fri.)	(Tue.)	(Fri.)	(Tue.)	(Fri.)	(Tue.)	(Wed.)
Collateral call cure (2 Bank Business Days)			3	(Wed.)	(Sat.)	(Wed.)	(Sat.)	(Wed.)	(Sat.)	(Wed.)	(Thur.)
Breach notice issuance			4	(Thur.)	(Sun.)	(Thur.)	(Sun.)	(Thur.)	(Sun.)	(Thur.)	(Fri.)
Breach cure (1 Bank Business Day)			5	(Fri.)	(Mon.)	(Fri.)	(Mon.)	(Fri.)	(Mon.)	(Fri.)	(Sat.)
Termination, Mass Transition notification			6	(Sat.)	(Tue.)	(Sat.)	(Tue.)	(Sat.)	(Tue.)	(Sat.)	(Sun.)
Mass Transition			7	(Sun.)	(Wed.)	(Sun.)	(Wed.)	(Sun.)	(Wed.)	(Sun.)	(Mon.)
Mass Transition complete (min two days)	M1b		8	(Mon.)	(Thur.)	(Mon.)	(Thur.)	(Mon.)	(Thur.)	(Mon.)	(Tue.)
			9	(Tue.)	(Fri.)	(Tue.)	(Fri.)	(Tue.)	(Fri.)	(Tue.)	(Wed.)
			10	(Wed.)	(Sat.)	(Wed.)	(Sat.)	(Wed.)	(Sat.)	(Wed.)	(Thur.)
			11	(Thur.)	(Sun.)	(Thur.)	(Sun.)	(Thur.)	(Sun.)	(Thur.)	(Fri.)
			12	(Fri.)	(Mon.)	(Fri.)	(Mon.)	(Fri.)	(Mon.)	(Fri.)	(Sat.)
			13	(Sat.)	(Tue.)	(Sat.)	(Tue.)	(Sat.)	(Tue.)	(Sat.)	(Sun.)
			14	(Sun.)	(Wed.)	(Sun.)	(Wed.)	(Sun.)	(Wed.)	(Sun.)	(Mon.)
		15	(Mon.)	(Thur.)	(Mon.)	(Thur.)	(Mon.)	(Thur.)	(Mon.)	(Tue.)	
		16	(Tue.)	(Fri.)	(Tue.)	(Fri.)	(Tue.)	(Fri.)	(Tue.)	(Wed.)	
		17	(Wed.)	(Sat.)	(Wed.)	(Sat.)	(Wed.)	(Sat.)	(Wed.)	(Thur.)	
		18	(Thur.)	(Sun.)	(Thur.)	(Sun.)	(Thur.)	(Sun.)	(Thur.)	(Fri.)	
		19	(Fri.)	(Mon.)	(Fri.)	(Mon.)	(Fri.)	(Mon.)	(Fri.)	(Sat.)	
		20	(Sat.)	(Tue.)	(Sat.)	(Tue.)	(Sat.)	(Tue.)	(Sat.)	(Sun.)	
		21	(Sun.)	(Wed.)	(Sun.)	(Wed.)	(Sun.)	(Wed.)	(Sun.)	(Mon.)	
		22	(Mon.)	(Thur.)	(Mon.)	(Thur.)	(Mon.)	(Thur.)	(Mon.)	(Tue.)	
		23	(Tue.)	(Fri.)	(Tue.)	(Fri.)	(Tue.)	(Fri.)	(Tue.)	(Wed.)	
		24	(Wed.)	(Sat.)	(Wed.)	(Sat.)	(Wed.)	(Sat.)	(Wed.)	(Thur.)	
		25	(Thur.)	(Sun.)	(Thur.)	(Sun.)	(Thur.)	(Sun.)	(Thur.)	(Fri.)	
		26	(Fri.)	(Mon.)	(Fri.)	(Mon.)	(Fri.)	(Mon.)	(Fri.)	(Sat.)	
		27	(Sat.)	(Tue.)	(Sat.)	(Tue.)	(Sat.)	(Tue.)	(Sat.)	(Sun.)	
		28	(Sun.)	(Wed.)	(Sun.)	(Wed.)	(Sun.)	(Wed.)	(Sun.)	(Mon.)	
		29	(Mon.)	(Thur.)	(Mon.)	(Thur.)	(Mon.)	(Thur.)	(Mon.)	(Tue.)	
		30	(Tue.)	(Fri.)	(Tue.)	(Fri.)	(Tue.)	(Fri.)	(Tue.)	(Wed.)	
		31	(Wed.)	(Sat.)	(Wed.)	(Sat.)	(Wed.)	(Sat.)	(Wed.)	(Thur.)	
		32	(Thur.)	(Sun.)	(Thur.)	(Sun.)	(Thur.)	(Sun.)	(Thur.)	(Fri.)	
		33	(Fri.)	(Mon.)	(Fri.)	(Mon.)	(Fri.)	(Mon.)	(Fri.)	(Sat.)	
		34	(Sat.)	(Tue.)	(Sat.)	(Tue.)	(Sat.)	(Tue.)	(Sat.)	(Sun.)	
		35	(Sun.)	(Wed.)	(Sun.)	(Wed.)	(Sun.)	(Wed.)	(Sun.)	(Mon.)	
		36	(Mon.)	(Thur.)	(Mon.)	(Thur.)	(Mon.)	(Thur.)	(Mon.)	(Tue.)	
		37	(Tue.)	(Fri.)	(Tue.)	(Fri.)	(Tue.)	(Fri.)	(Tue.)	(Wed.)	
		38	(Wed.)	(Sat.)	(Wed.)	(Sat.)	(Wed.)	(Sat.)	(Wed.)	(Thur.)	
		39	(Thur.)	(Sun.)	(Thur.)	(Sun.)	(Thur.)	(Sun.)	(Thur.)	(Fri.)	
		40	(Fri.)	(Mon.)	(Fri.)	(Mon.)	(Fri.)	(Mon.)	(Fri.)	(Sat.)	
		41	(Sat.)	(Tue.)	(Sat.)	(Tue.)	(Sat.)	(Tue.)	(Sat.)	(Sun.)	

Credit Exposure Update

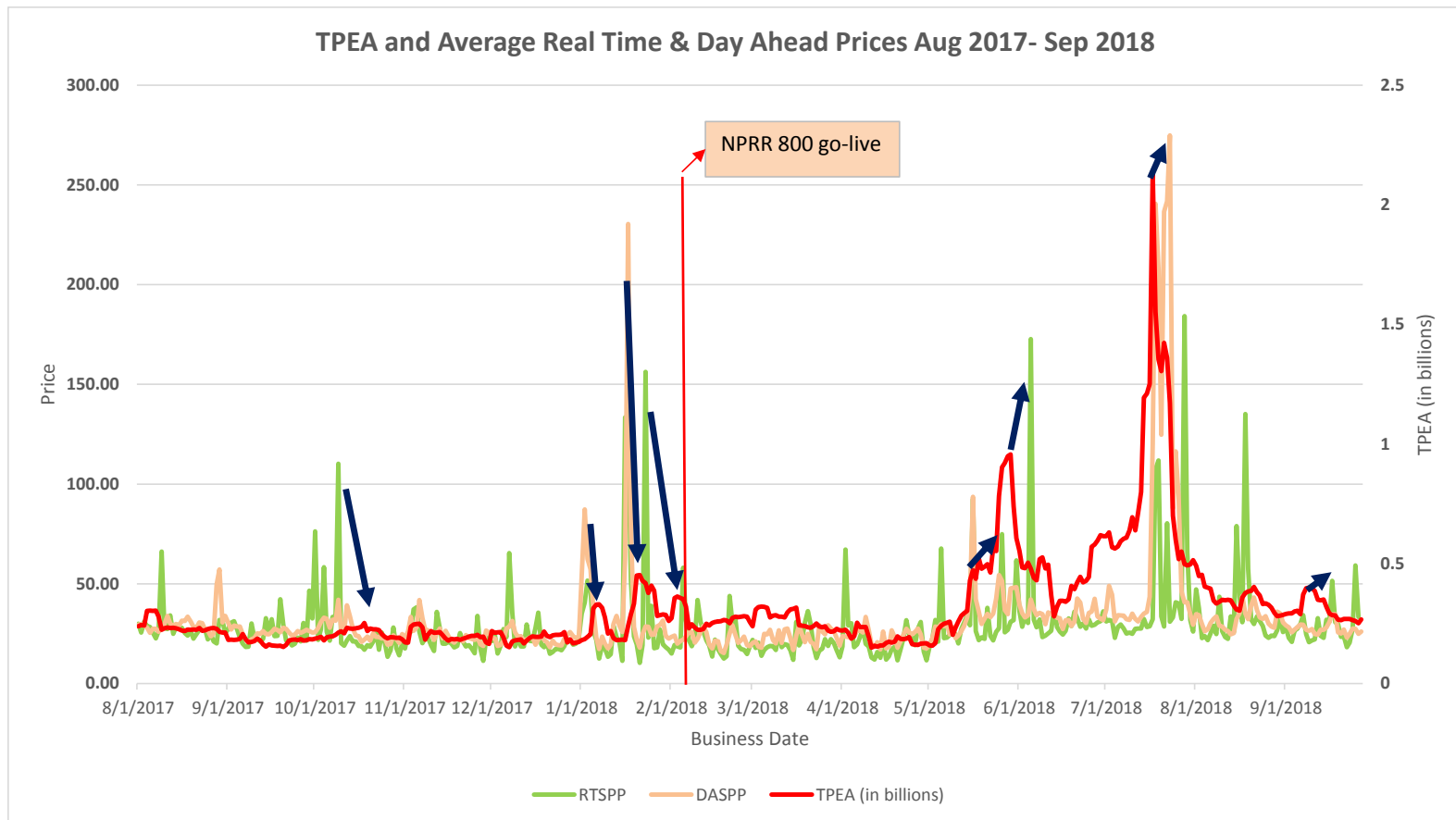
August 2018 compared to July 2018

- Market-wide average TPE decreased from \$965.6 million to \$457.7 million.
 - TPE decreased by
 - \$368.6 million for “Load and Gen” category.
 - \$87.1 million for “Trader” category.
 - \$46.7 million for “Load Only” category.
 - \$5.3 million across other categories.
- Average Excess Collateral increased from \$2,989.5 million to \$3,183.2 million.
 - Excess Collateral increased by
 - \$76.2 million for “Load and Gen” category.
 - \$62.8 million for “Trader” category.
 - \$44.8 million for “Load Only” category.
 - \$9.8 million across other categories.
- Number of active Counter-Parties decreased from 224 to 223.

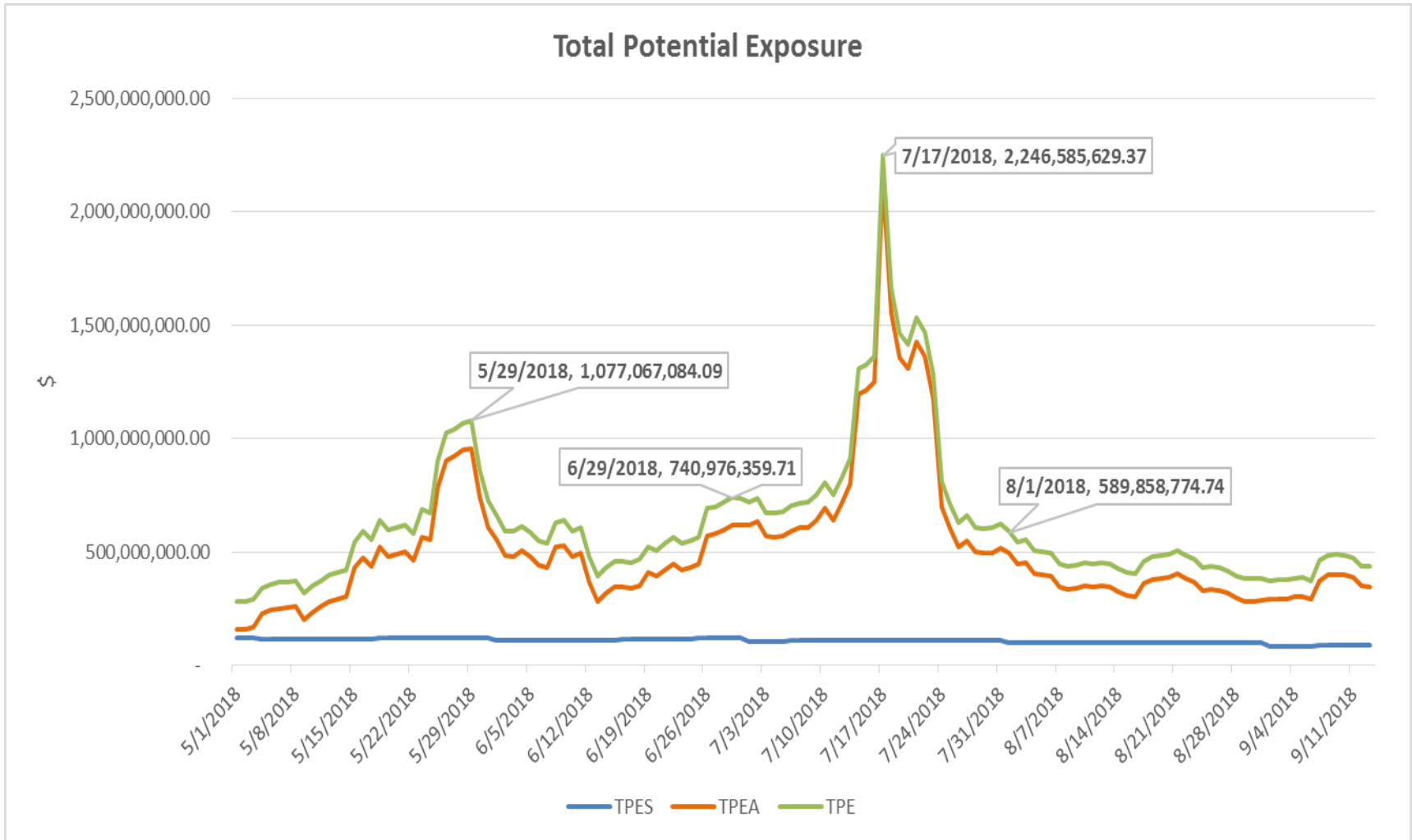
Credit Exposure Update

Impact of NRR 800

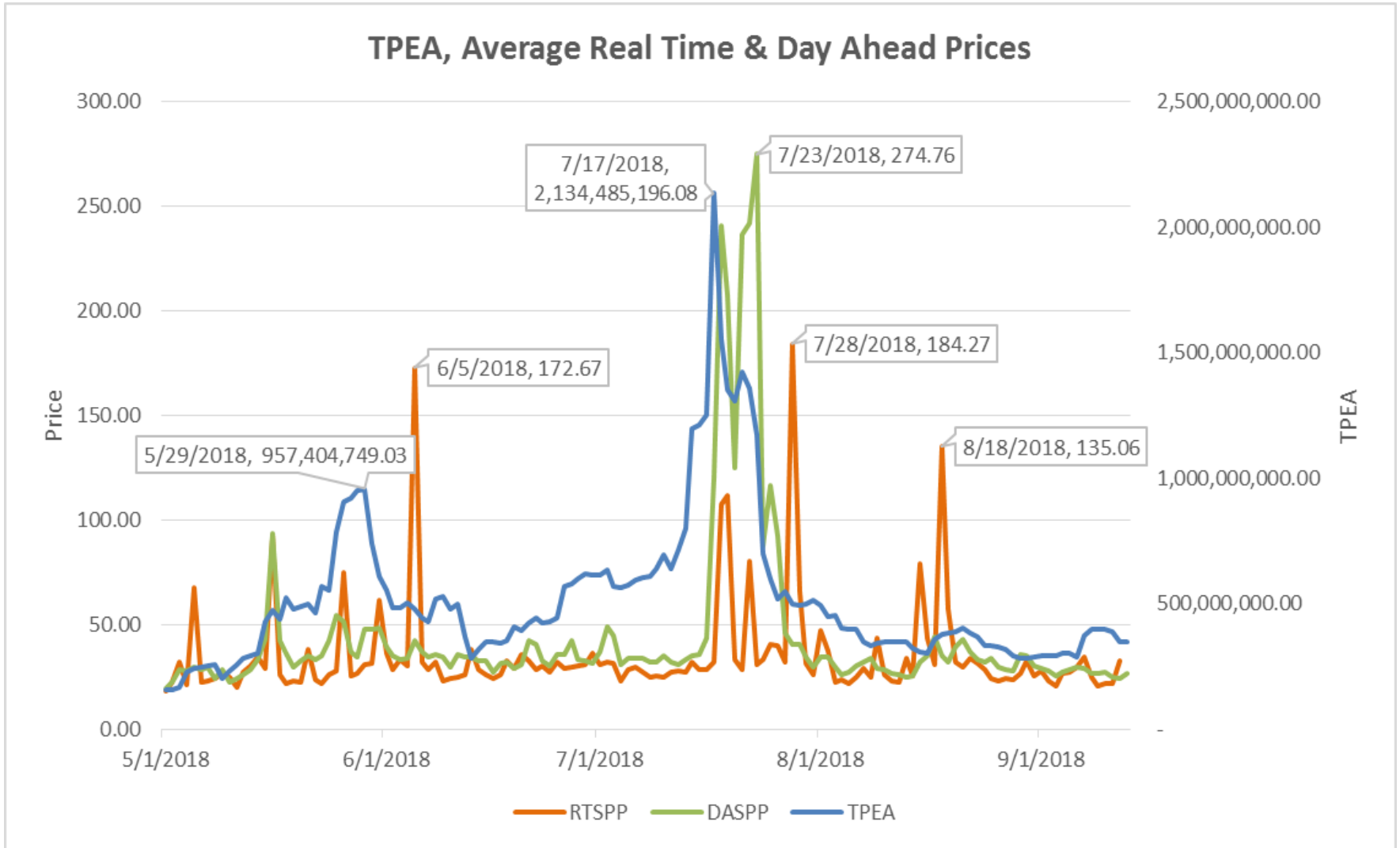
Prior to the implementation of NRR in February, increases in TPE often followed RT or DA price spikes. Since implementation, TPE often increases prior to market price increases.



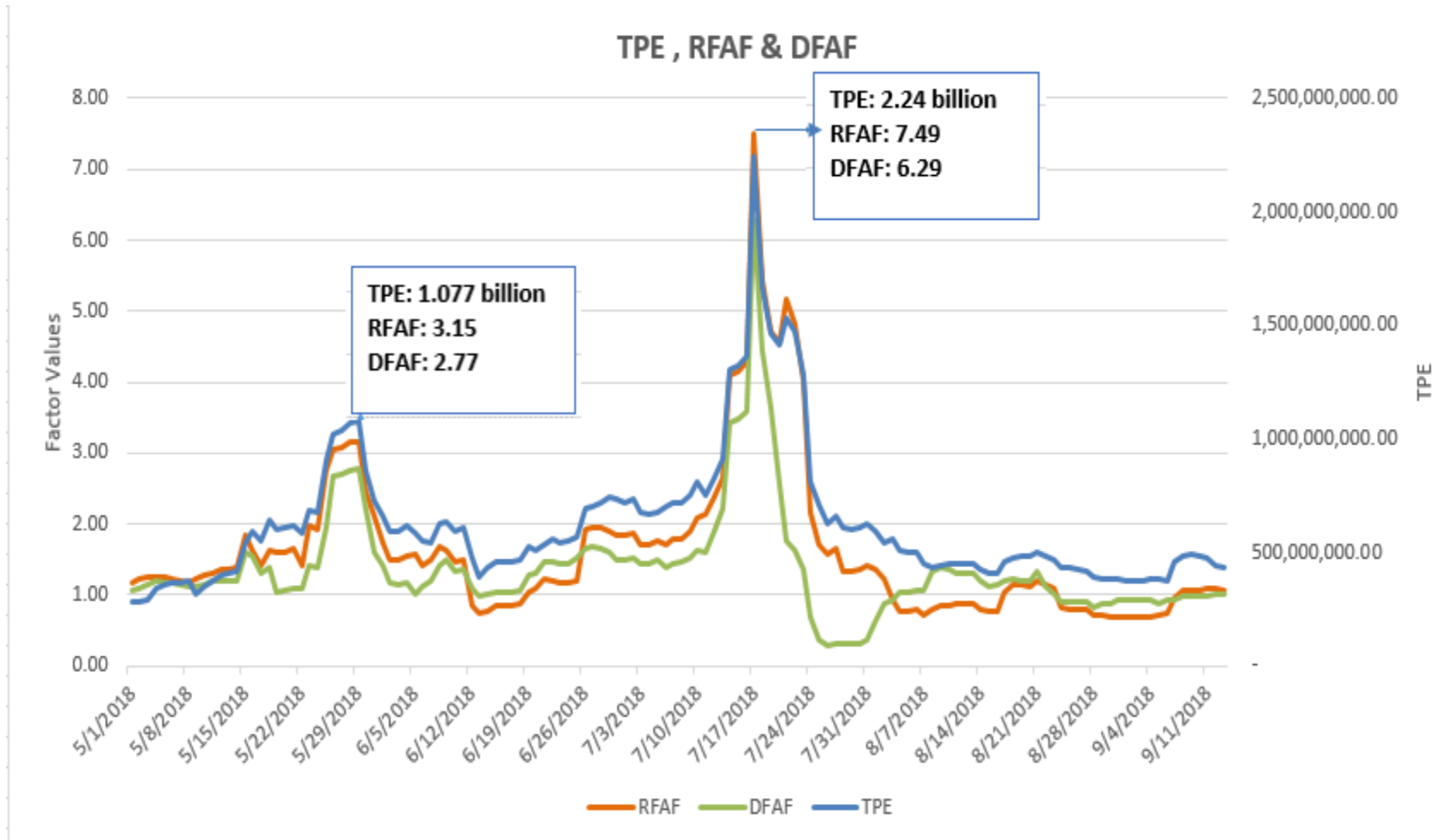
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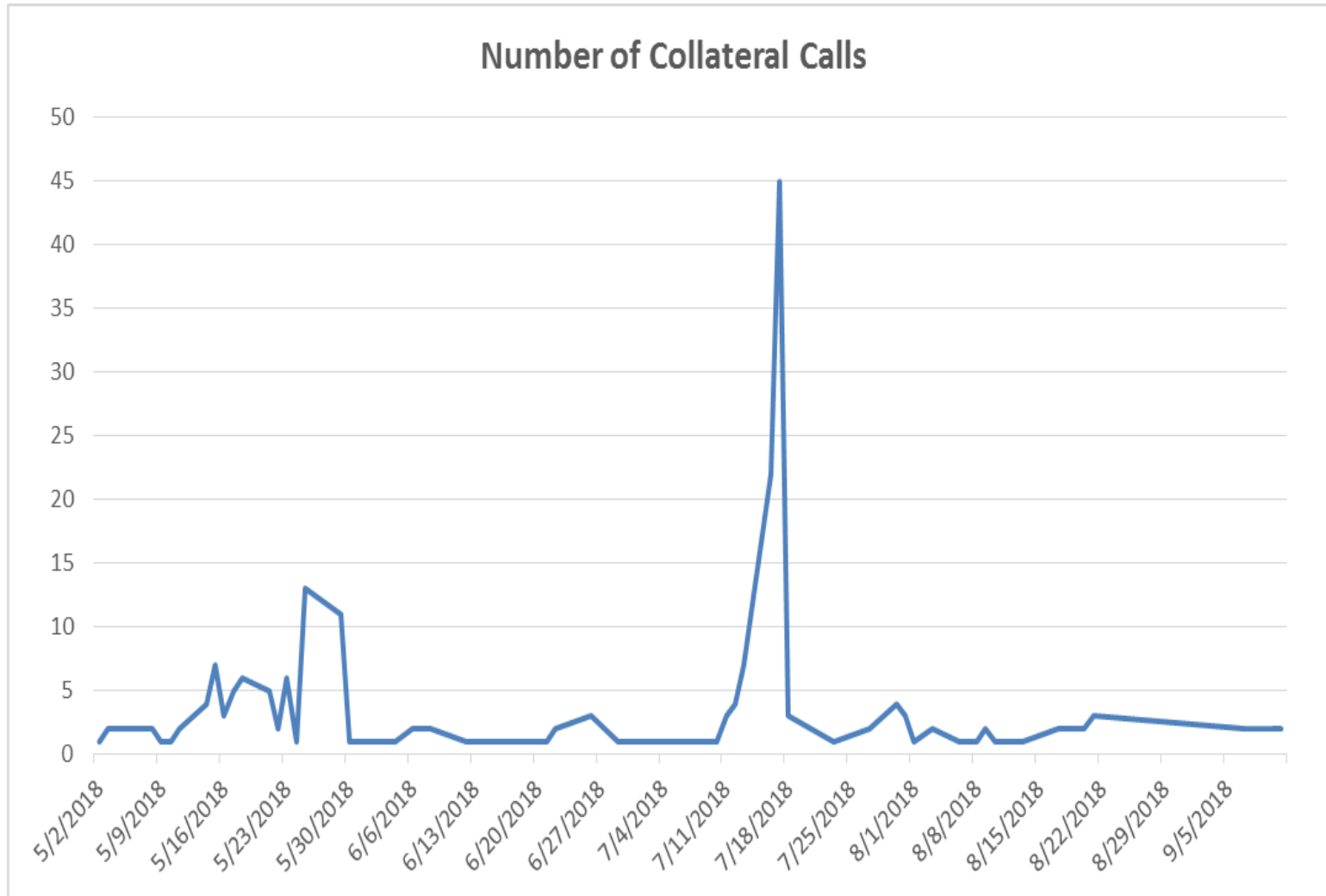
Credit Exposure Update



Credit Exposure Update

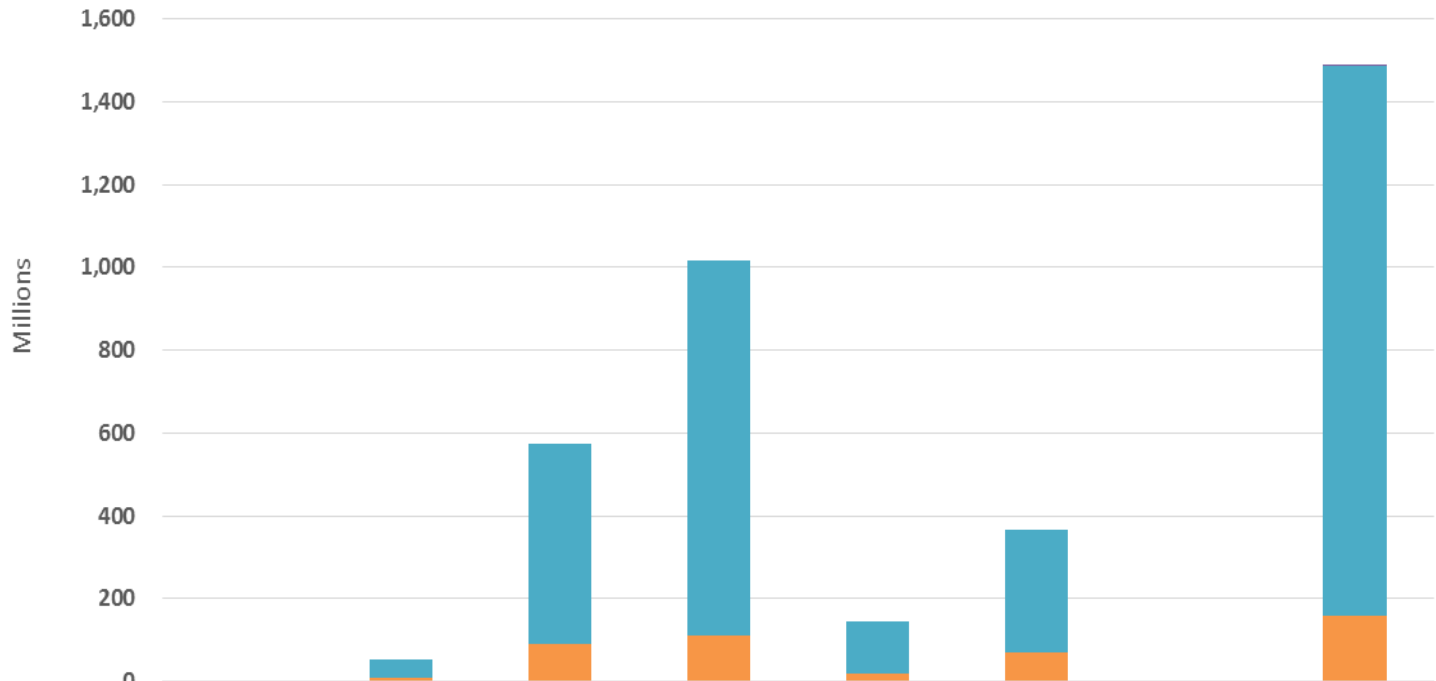


Credit Exposure Update



Credit Exposure Update

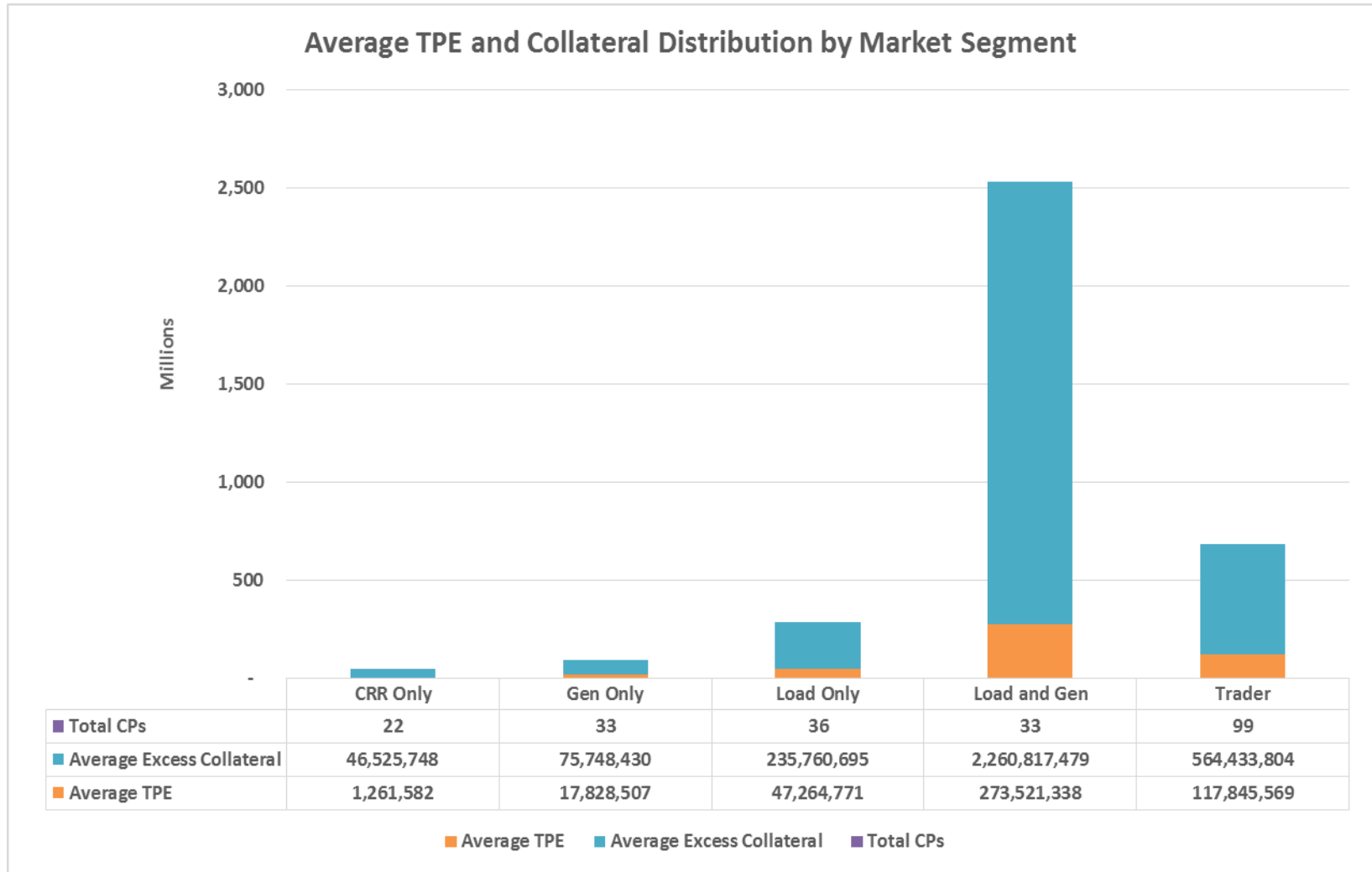
Average TPE and Collateral Distribution by Rating Category



	AAA	AA- to AA+	A- to A+	BBB- to BBB+	BB- to BB+	B- to B+	CCC+ and below	Not Rated
Total CPs	0	10	17	25	4	10	0	157
Average Excess Collateral	0	44,618,581	480,989,778	906,437,972	127,379,344	296,440,693	0	1,327,419,788
Average TPE	0	9,859,273	91,623,701	110,360,155	18,350,495	69,369,077	0	158,159,066

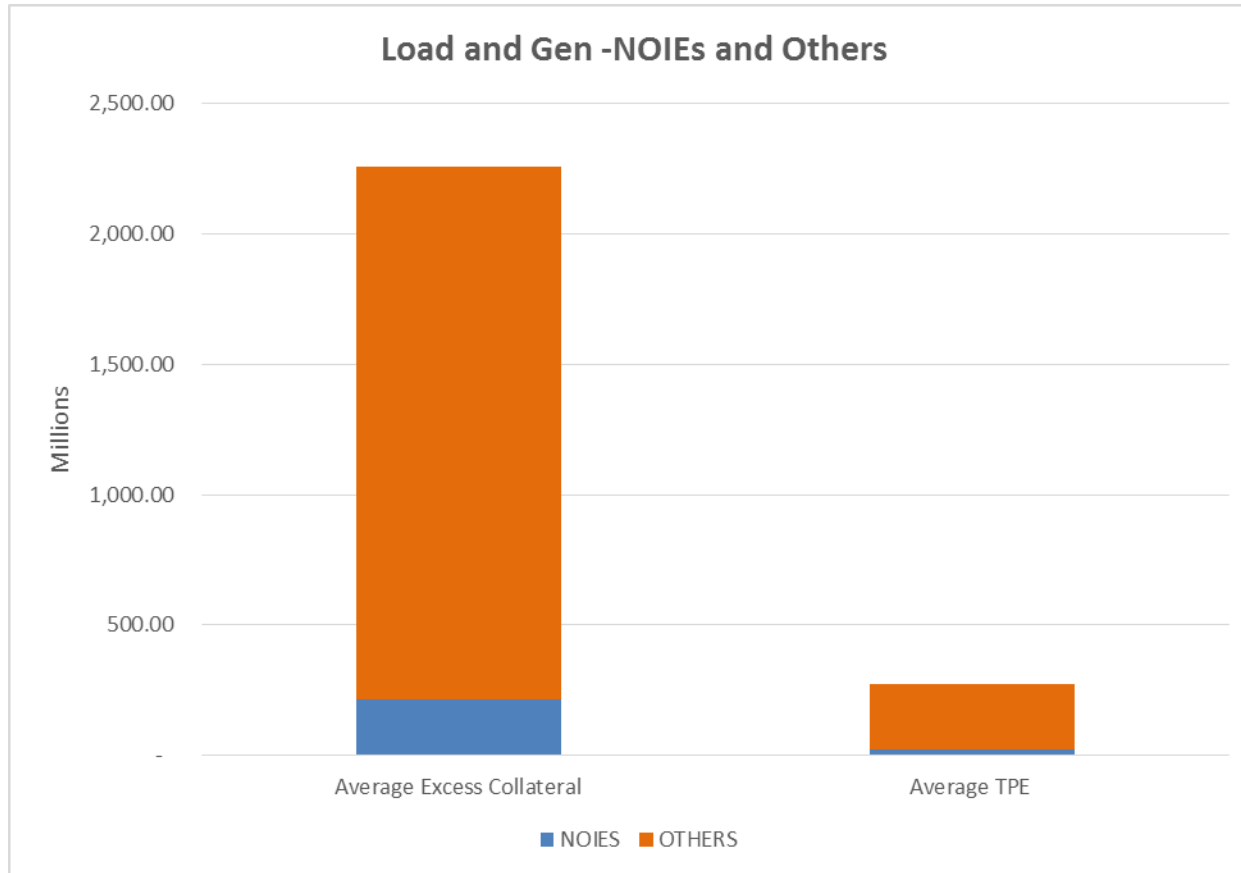
■ Average TPE
 ■ Average Excess Collateral
 ■ Total CPs

Credit Exposure Update



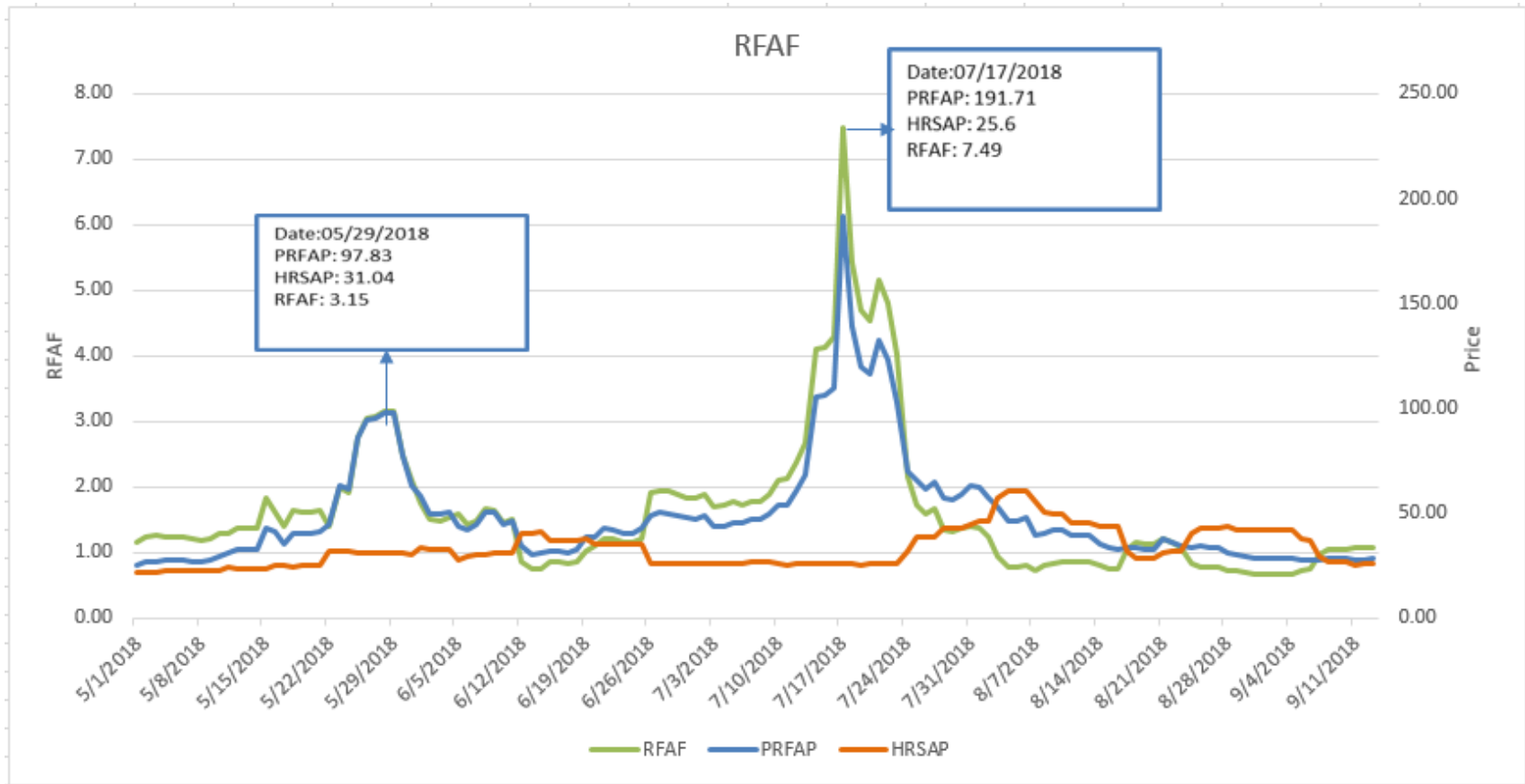
Credit Exposure Update

Average TPE and Excess Collateral Distribution among Load and Gen NOIES/Others



Credit Exposure Update

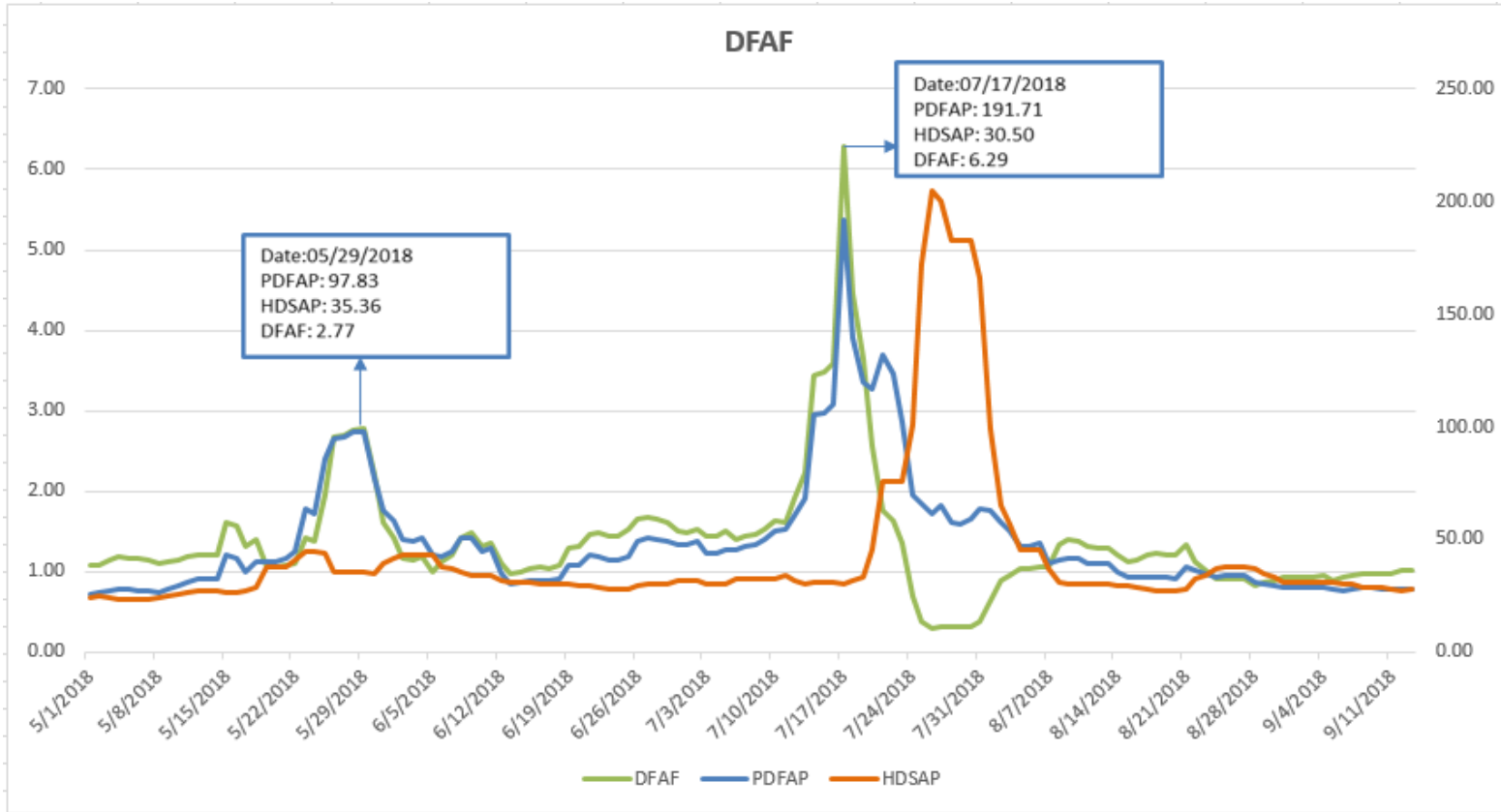
Real-Time Forward Adjustment Factor (RFAF)



- RFAF is calculated using 21 days of ICE future prices and 14 days of ERCOT Real Time Settled Prices for HB_NORTH settlement point

Credit Exposure Update

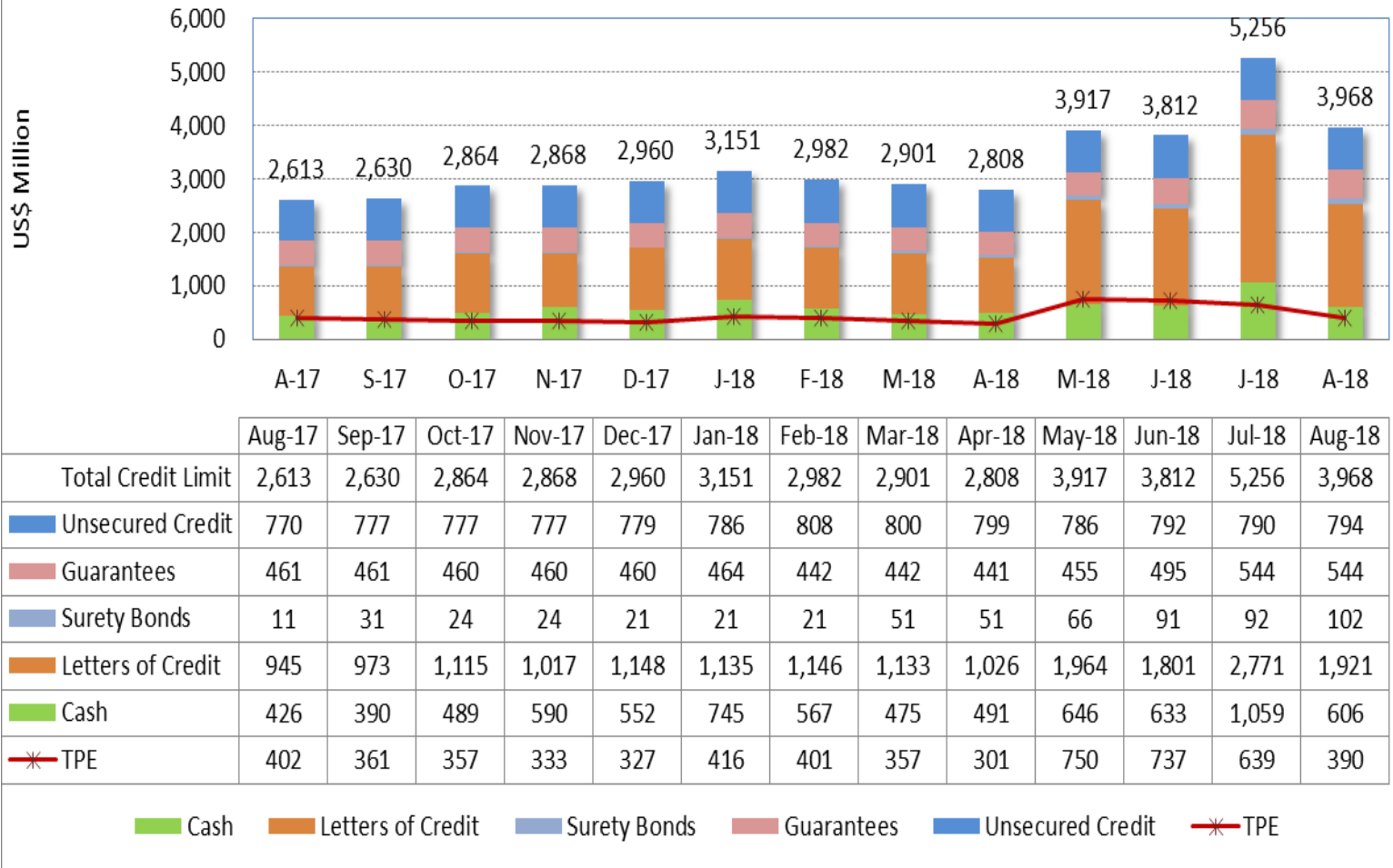
Day-Ahead Forward Adjustment Factor (DFAF)



- DFAF is calculated using 21 days of ICE future prices and 7 days of ERCOT Day Ahead Settled Prices for HB_NORTH settlement point

Credit Exposure Update

Credit Limit/Type of Security vs TPE



■ Cash
 ■ Letters of Credit
 ■ Surety Bonds
 ■ Guarantees
 ■ Unsecured Credit
 ✱ TPE

Counter-Party Credit Exposure – August 2018

Distribution of TPE by Rating and Category

Rating Group	CRR Only	Gen Only	Load Only	Load and Gen	Trader	Total TPE	Percent TPE
AAA	0	0	0	0	0	0	0.00%
AA- to AA+	386,097	0	0	9,473,176	0	9,859,273	2.15%
A- to A+	54,736	856,231	17,016,363	71,962,061	1,734,310	91,623,701	20.02%
BBB- to BBB+	427	3,974,933	3,423,385	83,983,813	18,977,598	110,360,155	24.11%
Investment Grade	441,260	4,831,164	20,439,748	165,419,050	20,711,907	211,843,129	46.28%
BB- to BB+	0	0	10,570,330	384,483	7,395,683	18,350,495	4.01%
B- to B+	0	43,533	0	44,487,105	24,838,438	69,369,077	15.16%
CCC+ and below	0	0	0	0	0	0	0.00%
Not Rated	820,322	12,953,810	16,254,694	63,230,700	64,899,540	158,159,066	34.55%
Non-Investment Grade	820,322	12,997,343	26,825,023	108,102,288	97,133,661	245,878,638	53.72%
Total TPE	1,261,582	17,828,507	47,264,771	273,521,338	117,845,569	457,721,767	100.00%
Percent TPE	0.28%	3.90%	10.33%	59.76%	25.75%	100.00%	

Distribution of Excess Collateral by Rating and Category

Rating Group	CRR Only	Gen Only	Load Only	Load and Gen	Trader	Excess Collateral	Percent Excess Collateral
AAA	0	0	0	0	0	0	0.00%
AA- to AA+	7,161,197	0	0	37,457,384	0	44,618,581	1.40%
A- to A+	14,089,105	34,143,769	44,480,411	331,952,000	56,324,493	480,989,778	15.11%
BBB- to BBB+	4,762,476	19,017,352	117,476,626	655,668,906	109,512,613	906,437,972	28.47%
Investment Grade	26,012,778	53,161,120	161,957,038	1,025,078,290	165,837,106	1,432,046,331	44.99%
BB- to BB+	0	0	46,450,844	29,784,273	51,144,227	127,379,344	4.00%
B- to B+	0	141,511	0	267,516,126	28,783,055	296,440,693	9.31%
CCC+ and below	0	0	0	0	0	0	0.00%
Not Rated	20,512,971	22,445,799	27,352,813	938,438,790	318,669,415	1,327,419,788	41.70%
Non-Investment Grade	20,512,971	22,587,310	73,803,657	1,235,739,190	398,596,698	1,751,239,825	55.01%
Total Excess Collateral	46,525,748	75,748,430	235,760,695	2,260,817,479	564,433,804	3,183,286,156	100.00%
Percent Excess Collateral	1.46%	2.38%	7.41%	71.02%	17.73%	100.00%	

Counter-Party Credit Changes July-August 2018

Summary of distribution by Category

Category	CP Distribution			Average TPE Distribution			Average Excess Collateral Distribution		
	Jul-18	Aug-18	Change	Jul-18	Aug-18	Change	Jul-18	Aug-18	Change
CRR Only	10.27%	9.87%	-0.40%	0.15%	0.28%	0.13%	1.48%	1.46%	-0.02%
Gen Only	14.73%	14.80%	0.07%	2.38%	3.90%	1.51%	2.29%	2.38%	0.09%
Load Only	16.07%	16.14%	0.07%	9.73%	10.33%	0.59%	6.39%	7.41%	1.02%
Load and Gen	14.7%	14.8%	0.07%	66.51%	59.76%	-6.75%	73.07%	71.02%	-2.05%
Trader	44.2%	44.4%	0.20%	21.23%	25.75%	4.52%	16.78%	17.73%	0.95%

Summary of distribution by Rating Group

Rating Group	CP Distribution			Average TPE Distribution			Average Excess Collateral		
	Jul-18	Aug-18	Change	Jul-18	Aug-18	Change	Jul-18	Aug-18	Change
0									
AAA	0.0%	0.0%	0.00%	0.0%	0.0%	0.00%	0.0%	0.0%	0.00%
AA- to AA+	4.5%	4.5%	0.02%	2.4%	2.2%	-0.20%	0.8%	1.4%	0.56%
A- to A+	7.6%	7.6%	0.03%	14.4%	20.0%	5.65%	16.5%	15.1%	-1.43%
BBB- to BBB+	11.6%	11.2%	-0.40%	25.4%	24.1%	-1.27%	26.9%	28.5%	1.62%
Investment Grade	23.7%	23.3%	-0.34%	42.1%	46.3%	4.18%	44.2%	45.0%	0.74%
BB- to BB+	1.8%	1.8%	0.01%	3.9%	4.0%	0.06%	2.4%	4.0%	1.59%
B- to B+	4.5%	4.5%	0.02%	21.9%	15.2%	-6.71%	14.8%	9.3%	-5.45%
CCC+ and below	0.0%	0.0%	0.00%	0.0%	0.0%	0.00%	0.0%	0.0%	0.00%
Not Rated	70.1%	70.4%	0.31%	32.1%	34.6%	2.46%	38.6%	41.7%	3.12%
Non-investment Grade	76.3%	76.7%	0.34%	57.9%	53.7%	-4.18%	55.8%	55.0%	-0.74%

Counter-Party Credit Exposure – August 2018 Average TPE and Excess Collateral for the Bottom Quintile of Market Participants

Quintile Distribution of Average TPE by Rating and Category								
Rating Group	CRR Only	Gen Only	Load Only	Load and Gen	Trader	Quintile Average TPE	Percent Quintile Average TPE	Percent Total Average TPE
AAA	0	0	0	0	0	0	0.0%	0.00%
AA- to AA+	5,533	0	0	0	0	5,533	0.2%	0.00%
A- to A+	0	0	0	0	0	0	0.0%	0.00%
BBB- to BBB+	0	298	0	0	0	298	0.0%	0.00%
Investment Grade	5,533	298	0	0	0	5,831	0.2%	0.00%
BB- to BB+	0	0	0	0	0	0	0.0%	0.00%
B- to B+	0	43,533	0	0	0	43,533	1.6%	0.01%
CCC+ and below	0	0	0	0	0	0	0.0%	0.00%
Not Rated	41,212	694,873	627,777	223,910	1,123,198	2,710,970	98.2%	0.59%
Non-Investment Grade	41,212	738,406	627,777	223,910	1,123,198	2,754,503	99.79%	0.60%
Quintile Average TPE	46,746	738,704	627,777	223,910	1,123,198	2,760,334	100.0%	0.60%
Percent Quintile Average TPE	1.7%	26.8%	22.7%	8.1%	40.7%	100.0%		
Percent Total Average TPE	0.01%	0.16%	0.14%	0.05%	0.25%	0.60%		
Quintile Distribution of Excess Collateral by Rating and Category								
Rating Group	CRR Only	Gen Only	Load Only	Load and Gen	Trader	Total Quintile Excess Collateral	Percent Quintile Excess Collateral	Percent Total Excess Collateral
AAA	0	0	0	0	0	0	0.00%	0.00%
AA- to AA+	93,014	0	0	0	0	93,014	2.50%	0.00%
A- to A+	143,840	0	0	0	0	143,840	3.87%	0.00%
BBB- to BBB+	150,000	3,154	0	0	0	153,154	4.12%	0.00%
Investment Grade	386,855	3,154	0	0	0	390,008	10.50%	0.01%
BB- to BB+	0	0	0	0	0	0	0.00%	0.00%
B- to B+	0	141,511	0	0	102,136	243,647	6.56%	0.01%
CCC+ and below	0	0	0	0	0	0	0.00%	0.00%
Not Rated	497,432	180,813	795,979	89,174	1,516,756	3,080,153	82.94%	0.10%
Non-Investment Grade	497,432	322,324	795,979	89,174	1,618,891	3,323,800	89.50%	0.10%
Total Quintile Excess Collateral	884,287	325,477	795,979	89,174	1,618,891	3,713,808	100.00%	0.12%
Percent Quintile Excess Collateral	23.81%	8.76%	21.43%	2.40%	43.59%	100.00%		
Percent Total Excess Collateral	0.03%	0.01%	0.03%	0.00%	0.05%	0.12%		

Credit Updates – CMM Technology Refresh – Upcoming Phases

Approved Revision / Change Requests

Revision / Change Request	Project Status	Target Release Date*
NPRR 484 (1B) – Revision to Congestion Revenue Rights Credit Calculations and Payments	P	TBD
NPRR 519 – Exemption of ERS-Only QSEs from Collateral and Capitalization Requirements	E	Dec 2018
NPRR 620 – Collateral Requirements for Counter-Parties with No Load or Generation	E	Dec 2018
NPRR 702 – Flexible Accounts, Payment of invoices, and Disposition of Interest on Cash Collateral	P	TBD
NPRR 755 – Data Agent Only QSE Registration	E	Dec 2018
NPRR 829 – Incorporate Real-Time Non-Modeled Telemetered Net Generation by Load Zone into the Estimate of RTL	P	TBD

December 2018 go-live is at risk due to missed requirements and complexity of certain technical requirements. The team is identifying mitigation measures and assessing the schedule impact to determine the new go-live date.

Project Status Codes: NS = Not Started, I = Initiation, P = Planning, E = Execution, H = On Hold
TBD = To Be Determined

Questions?

Appendix

Credit Components

Component	Definition
RFAF	<i>Real-Time Forward Adjustment Factor</i> —The adjustment factor for RTM-related forward exposure
DFAF	<i>Day-Ahead Forward Adjustment Factor</i> —The adjustment factor for DAM-related forward exposure
RTLE	<i>Real-Time Liability Extrapolated</i> —M1 multiplied by the sum of the net amount, with zero substituted for missing values, due to or from ERCOT by the Counter-Party in the 14 most recent Operating Days for which RTM Initial Statements are produced for Counter-Parties according to the ERCOT Settlement Calendar divided by 14.
DALE	<i>Average Daily Day-Ahead Liability Extrapolated</i> —M1 multiplied by the sum of the net amount, with zero substituted for missing values, due to or from ERCOT by the Counter-Party in the seven most recent Operating Days for which DAM Settlement Statements are produced for Counter-Parties according to the ERCOT Settlement Calendar divided by seven.
MCE	<i>Minimum Current Exposure</i> —For each Counter-Party, ERCOT shall determine a Minimum Current Exposure (MCE)
M1	Multiplier for DALE and RTLE. Provides for forward risk during a Counter-Party termination upon default based upon the sum of the time period required for any termination upon default (M1a) and the time period required for a Mass Transition only (M1b). The M1a component is applicable to all Counter-Parties. The M1b component is applicable only to Counter-Parties representing any QSE associated with a LSE.
M1a	Time period required for any termination upon default.
M1b	Weighted average transition days = $\text{Min}(B, (2 + \text{Max}(1, (u+1)/2)) * (1-DF))$, rounded up to whole days

Estimated Aggregate Liability Minimum Current Exposure

- $EAL_q = \text{Max} [\text{IEL during the first 40-day period only beginning on the date that the Counter-Party commences activity in ERCOT markets, } RFAF * \text{Max} \{RTLE \text{ during the previous } lrq \text{ days}\}, RTLF] + DFAF * DALE + \text{Max} [RTLCNS, \text{Max} \{URTA \text{ during the previous } lrq \text{ days}\}] + OUT_q + ILE_q$
- $MCE = RFAF * MAF * \text{Max}[\{ [L_{i, od, p} * RTSPP_{i, od, p}] / n \}, \{ [[[L_{i, od, p} * T2 - G_{i, od, p} * (1 - NUCADJ) * T3] * RTSPP_{i, od, p}] + [RTQQNET_{i, od, p} * T5]] / n \}, \{ [G_{i, od, p} * NUCADJ * T1 * RTSPP_{i, od, p}] / n \}, \{ (DARTNET_{i, od, p}) * T4 / n \}]$