

PJM Triennial RPM CONE Update – ATWACC  
*For:* Southern Maryland Electric Cooperative  
August 1, 2014 – PJM Capacity Senior Task Force



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# Introduction and Summary



- The 2014 PJM/Brattle Cost of New Entry (“CONE”) study “Cost of New Entry Estimates for Combustion Turbine and Combined Cycle Plants in PJM With June 1, 2018 Online Date” uses a 13.8% Return on Equity (“ROE”), a 7% cost of debt, a 40.6% combined Federal/State tax rate and a 60% Debt/40% Equity capital structure in the 8.0% after-tax weighted average cost of capital (“ATWACC”).
- ATWACC and components are a determinant of the Interest During Construction component of the overnight cost of the RPM combustion turbine reference unit and an input and determinant of levelized Gross CONE.

# Introduction and Summary



- PJM/Brattle use the Capital Asset Pricing Model (“CAPM”) to arrive at the 13.8% ROE:
  - The 13.8% ROE is not supported by application of the CAPM to a 4-member merchant group or a larger proxy group consisting of merchant entities and hybrid utilities (see Appendix for hybrid proxy group).
  - Brattle/PJM utilizes a 3-member proxy group; this 13.8% ROE is also not derivable from the Brattle proxy group. In fact, the median ROE is 9.8% and the “75<sup>th</sup> percentile” ROE is 10.5%, which when combined with Brattle’s other ATWACC components yields a 7.33% ATWACC.
- PJM/Brattle use a 7% cost of debt; this rate is higher than the 60-day moving average yield for both “B” (Calpine and Dynegy) and “BB” (AES and NRG) rated debt for the past 1.8 to 2.5 years, respectively.

# Introduction and Summary



- Adjusting for this lower ROE, actual capital structure of 70% Debt/30% Equity and current cost of debt (calculated as the 60-day yield for “B” and “BB” rated debt, as applicable, for each of the four proxy group companies, weighted by market capitalization) of the proxy group would result in an ATWACC of 5% (rounded).
- For the purposes of gross CONE, would raise the equity ratio by 10% (to be the same 60% Debt, 40% Equity proposed by PJM/Brattle) and would use the PJM/Brattle cost of debt of 7%.
- Thus, the only change to PJM/Brattle ATWACC would be to the 13.8% ROE and, as discussed below, to re-calculate the effective State/Federal Tax rate to account for the removal of DOM as a CONE Area.
- These two changes yield a ATWACC of 6.95% to 7.1% ATWACC; which for purposes of CSTF would recommend 7.1%.

# Introduction and Summary



- A 7.1% ATWACC is consistent with Financial Advisory ATWACC's cited by Brattle (FirstEnergy & Duke, generation divestitures, all updated to February 2014 by Brattle using the risk free rate).
- In a July 11 CSTF Presentation for P3, PA Consulting recommends an ATWACC of 9% to 13%:
  - These ATWACC ranges are not supported by transparent or publicly-available data to support PA Consulting's conclusions.
- See next 2 slides for the Brattle & PA Consulting ATWACC recommendations.

# Introduction and Summary



	Brattle/PJM	PA Consulting (for P3)	SMECO
Proxy Group Members	Three Merchant entities	No identified proxy group members	Four Merchant entities
Does ROE used in ATWACC derive from Proxy Group?	No	No	Yes
ROE Determination Process	Median ROE is 9.8% and 75 <sup>th</sup> percentile ROE is 10.5%, yet use 13.8% ROE.	No transparency in ROE determination	Use 75 <sup>th</sup> percentile of range of ROEs from Merchant Proxy Group
ROE	13.8%	15% to 20%	10.4%
Debt Cost	7%	7% to 9%	Use 7%
Capital Structure	60% Debt (D) / 40% Equity (E)	Lower: 55% D/45% E Higher: 45% D/55% E	Proxy group would suggest debt % consistent with Brattle, but as compromise propose 50% D/50% E
ATWACC	8%	Lower: 9% Higher: 13.5%	6.95% to 7.1%, recommend 7.1%

# Brattle/PJM ATWACC



## Brattle/PJM proposed ATWACC :

	Cost Rate	Tax rate	Adjusted Cost Rate	Capital Structure	Weighted Cost
Equity	13.8%	n/a	13.8%	50.00%	5.52%
Debt	7%	40.6%	4.2%	50.00%	2.49%
				ATWACC:	8.01%

## Brattle/PJM ATWACC if 75<sup>Th</sup> percentile ROE from Brattle Proxy Group is actually used in ATWACC:

	Cost Rate	Tax rate	Adjusted Cost Rate	Capital Structure	Weighted Cost
Equity	10.5%	n/a	10.5%	50.00%	5.25%
Debt	7%	40.6%	4.16%	50.00%	2.08%
				ATWACC:	7.33%

Note that if the proper Effective Tax rate is used, this drops to 7.3%. Brattle's proposed ATWACC is 8%



# Brattle/PJM ATWACC



Brattle PJM CONE Study, page 37:

“Although the specific assumptions on capital structure, ROE, and COD corresponding to our ATWACC have almost no impact on the CONE calculation, we do need to assume specific values in order to quantify interest during construction and depreciable capital costs. We assumed a capital structure of 60/40 debt-equity ratio to reflect typical projects’ capital structures and their associated ROE and COD. For a representative COD of 7.0% and a 60/40 debt-to-equity capital structure, the ATWACC of 8.0% translates to an ROE of 13.8%, as shown in Table 25.” (emphasis added)

# Brattle/PJM ATWACC



## Brattle/PJM ROE is not derived from CONE Study Proxy Group

### CAPM MODEL - PJM RPM GROSS CONE TRIENNIAL UPDATE

Developed for PJM Capacity Senior Task Force Discussions

Re-creation of Brattle/PJM's Merchant Proxy Group

	A	B				C	D	E	F
		Risk-Free					Market Risk		Return on
	Company	Rate				Beta	Premium	Col. C * Col. D	Equity
1	NRG Energy	3.40%				0.98	6.50%	6.37%	9.77%
2	Dynegy	3.40%				0.56	6.50%	3.64%	7.04%
3	Calpine	3.40%				1.19	6.50%	7.74%	11.14%
								<b>Average:</b>	<b>9.3%</b>
								<b>75th percentile:</b>	<b>10.5%</b>
								<b>Midpoint:</b>	<b>9.1%</b>
								<b>Median:</b>	<b>9.8%</b>

A Brattle Report: "Cost of New Entry Estimates for Combustion Turbine and Combined Cycle Plants in PJM, pages 34-37.

B *Id.*

C *Id.*

D *Id.*

E Col. C times Col. D

F Col. B plus Col. E

# Brattle/PJM ATWACC



## Brattle CONE Study, Table 25:

Summary of Cost of Capital Reference Points and Recommended ATWACC

Company	Brattle Updated ATWACC Estimates						Prior Estimates Adjusted to Feb 2014 Risk-Free Rate July 2012			
	S&P Credit Rating [1]	Equity Beta [2]	Return on Equity [3]	Cost of Debt [4]	Debt/ Equity Ratio [5]	After Tax WACC [6]	Financial Advisor Estimates for NRG- GenOn Merger [7]	Apr 2011 Brattle Estimates [8]	2011 Analyst Estimates [9]	2011 Fairness Opinions [10]
<b>Publicly Traded Companies</b>										
Calpine	B	1.29	11.9%	8.7%	61/39	7.8%		6.7%	6.6%	
NRG	BB	1.04	10.4%	7.5%	73/27	6.1%	7.7 - 9.2%	6.3%	6.2%	
Dynegy	B	0.49	7.1%	8.7%	42/58	6.1%		7.4%	7.1 - 11.1%	
<b>Acquired Companies (previously traded)</b>										
GenOn Energy							9.2 - 10.2%	10.3%	7.6 - 9.6%	
Mirant								8.0%	7.6 - 8.6%	
<b>Merchant Generation Divestitures</b>										
FirstEnergy Merchant Generation										7.1 - 8.1%
Allgheny Merchant Generation										7.1 - 7.6%
Duke's Merchant Generation										7.3 - 8.3%
<b>Recommendation</b>			<b>13.8%</b>	<b>7.0%</b>	<b>60/40</b>			<b>8.0%</b>		

**13.8% ROE**

**Debt Cost & Debt/Equity Ratio**

**8% ATWACC**

## PA Consulting's (for P3) ATWACC:

Based on PA's analysis, the 2014 Brattle Study may be underestimating the proposed after-tax WACC by 1 to 5.5 percentage points - when adjusting for appropriate D/E ratio, COD, and COE parameters

Based on the observations and parameter ranges outlined on the previous slides, PA recalculated the after-tax WACC, assuming a 40% corporate tax rate in all cases.

- The lower end of PA's range results in an after-tax WACC of approximately 9% (~1 percentage point higher than the 2014 Brattle Study);
- The higher end of PA's range results in an after-tax WACC of approximately 13.5% (~5.5 percentage points higher than the 2014 Brattle Study).

	Brattle	PA (Lower)	PA (Higher)
D/E Ratio	60% / 40%	55% / 45%	45% / 55%
Pre-Tax COD	7.0%	7.0%	9.0%
COE	13.8%	15.0%	20.0%
<b>After-Tax WACC</b>	<b>8%</b>	<b>9%</b>	<b>13.5%</b>

# ATWACC Recommendation



## (Summary)

- FERC policy is that “a proxy group should consist of at least four, and preferably at least five members, if representative members can be found” (Opinion No. 511, SFPP, L.P., 134 FERC ¶ 61,121 at Para 203 (2011)). Accordingly, used the four publicly traded merchant entities available.
- CAPM analysis of a Four-company proxy group of Merchant entities, indicates the ROE should be set between 10% to 10.4%.
- A 10.4% ROE, along with the composite capital structure (70% debt, 30% Equity), and a 4.7% debt cost rate results in an 5% ATWACC.
- For the purposes of Gross CONE, recommend a 50% Debt/50% Equity capital structure (this is a 10% increase in the equity ratio from the 60% Debt/40% Equity in PJM/Brattle), and Brattle/PJM 7% debt cost, yielding a 6.95% to 7.1% ATWACC.

# ATWACC Recommendation

(CAPM Inputs)



## CAPM Inputs:

- Risk-Free Rate:
  - For risk-free rate, Brattle uses a 15-day average yield of 30-year U.S. Treasury Rate, a 3.4% risk-free rate.
  - For this analysis, use 60-day average yield on 30-year U.S. Treasury Bonds (60 days ending 7/10/14), a 3.42% risk-free rate
- Market Risk Premium:
  - For market risk premium, use same 6.5% long-term equity risk premium used by Brattle.

# ATWACC Recommendation

(CAPM Inputs, continued)



- Beta:
  - Brattle uses Bloomberg data; this analysis uses maximum Value Line and Bloomberg “Professional” beta as of mid-July 2014.
- Effective State/Federal Tax Rate:
  - Brattle appears to use a 40% effective State/Federal tax rate in their ATWACC calculations. In fact, the average corporate state tax rate is 8.65% (see Appendix), which when combined with the 35% Federal rate yields an effective tax rate of 40.7%.
  - However, PJM has eliminated DOM as a CONE study area, implying that the VA state tax rate should be eliminated from the state tax average. Making this adjustment raises the combined effective State and Federal rate to be 41.05%.
  - Appendix contains CONE Area-specific ATWACC’s based on relevant state tax rates

# ATWACC Recommendation

(ROE determination)



**CAPM MODEL - PJM RPM GROSS CONE TRIENNIAL UPDATE**  
**Developed for PJM Capacity Senior Task Force Discussions**  
**Merchant Proxy Group**

	A	B	C		D	E	F	
		Risk-Free	Beta	Beta (Bloomberg)		Market Risk		Return on
	Company	Rate	Value Line	Raw	Adjusted	Premium	Col. C * Col. D	Equity
1	NRG Energy	3.42%	1.00	1.00	0.997	6.50%	6.48%	9.90%
2	Dynegy	3.42%	-	0.60	0.735	6.50%	4.78%	8.20%
3	Calpine	3.42%	1.00	0.77	0.848	6.50%	6.47%	9.89%
4	AES	3.42%	1.20	1.29	1.195	6.50%	8.40%	11.82%
							Average:	10.0%
							75th percentile:	10.4%
							Midpoint:	10.0%
							Median:	9.9%

A Proxy group of Merchant entities.

B Risk-Free Rate from US Treasury Dept., average daily yield on 30 year Treasuries for 6 months ending July 10, 2014.

C Beta from Value Line and Bloomberg Professional; Bloomberg provides a raw and adjusted Beta.

D Market Risk Premium of 6.5%, consistent with Brattle.

E Col. C times Col. D

F Col. B plus Col. E



# ATWACC Recommendation



## Lower:

	Cost Rate	Tax rate	Adjusted Cost Rate	Capital Structure	Weighted Cost
Equity	10%	n/a	10%	50.00%	5.00%
Debt	7%	41.05%	3.8%	50.00%	1.92%
				ATWACC:	6.92%

Round to 6.95%

## Higher:

	Cost Rate	Tax rate	Adjusted Cost Rate	Capital Structure	Weighted Cost
Equity	10.4%	n/a	10.4%	50.00%	5.19%
Debt	7%	41.05%	3.8%	50.00%	1.92%
				ATWACC:	7.11%

Round to 7.1%

# Appendix: Hybrid Proxy Group



**CAPM MODEL - PJM RPM GROSS CONE TRIENNIAL UPDATE**  
**Developed for PJM Capacity Senior Task Force Discussions**  
**PJM Hybrid Proxy Group**

	A	B	C		D	E	F		
		Risk-Free	Beta	Beta (Bloomberg)		Max	Market Risk	Return on	
	Company	Rate	Value Line	Raw	Adjusted	Beta	Premium	Col. C * Col. D	Equity
1	Dominion	3.42%	0.70	0.59	0.73	0.73	6.50%	4.72%	8.14%
2	NextEra Energy	3.42%	0.70	0.77	0.85	0.85	6.50%	5.51%	8.93%
3	American Electric Power	3.42%	0.70	0.68	0.79	0.79	6.50%	5.11%	8.53%
4	Exelon	3.42%	0.70	0.41	0.61	0.70	6.50%	4.55%	7.97%
5	PPL Corporation	3.42%	0.70	0.36	0.57	0.70	6.50%	4.55%	7.97%
6	Public Service Ent. Group	3.42%	0.80	0.40	0.60	0.80	6.50%	5.20%	8.62%
8	FirstEnergy	3.42%	0.70	0.60	0.73	0.73	6.50%	4.75%	8.16%
7	NRG Energy	3.42%	1.00	1.00	0.997	1.00	6.50%	6.48%	9.90%
9	Dynegy	3.42%	-	0.60	0.735	0.74	6.50%	4.78%	8.20%
10	Calpine	3.42%	1.00	0.77	0.848	1.00	6.50%	6.47%	9.89%
11	AES	3.42%	1.20	0.77	0.848	1.20	6.50%	7.80%	11.22%
								Average:	8.9%
								75th percentile	9.4%
								Median:	8.5%

**A** Proxy group of Merchant entities plus PJM companies with generation assets.

**B** Risk-Free Rate from US Treasury Dept., average daily yield on 30 year Treasuries for 6 months ending July 10, 2014.

**C** Beta from Value Line and Bloomberg Professional; Bloomberg provides a raw and adjusted Beta.

**D** Market Risk Premium of 6.5%, consistent with Brattle.

**E** Col. C times Col. D

**F** Col. B plus Col. E

# Appendix: State/Fed. Tax Rate



## Brattle

CONE Area	State Corp. Tax Rate
New Jersey	9.00%
Maryland	8.25%
RTO	9.99%
WMAAC	9.99%
DOM	6.00%
<b>Average</b>	<b>8.65%</b>

1-35% Federal rate \* 8.65%  
= 5.6199%; plus 35% Federal  
rate = 40.7% effective rate

## Revised

CONE Area	State Corp. Tax Rate
New Jersey	9.00%
Maryland	8.25%
RTO	9.99%
WMAAC	9.99%
DOM	6.00%
<b>Average</b>	<b>9.31%</b>

1-35% Federal rate \* 9.31%  
= 6.05%; plus 35% Federal  
rate = 41.05% effective rate

# Appendix: CONE-Area Specific ATWACC



<u>CONE Area / State</u>	<u>Effective Tax Rate</u>	<u>Resultant ATWACC</u>
EMAAC / New Jersey	40.9%	7.11%
SWMAAC / Maryland	40.4%	7.13%
RTO / Pennsylvania	41.5%	7.09%
WMAAC / Pennsylvania	41.5%	7.09%
Dominion / Virginia	38.9%	7.18%
	Average	7.12%