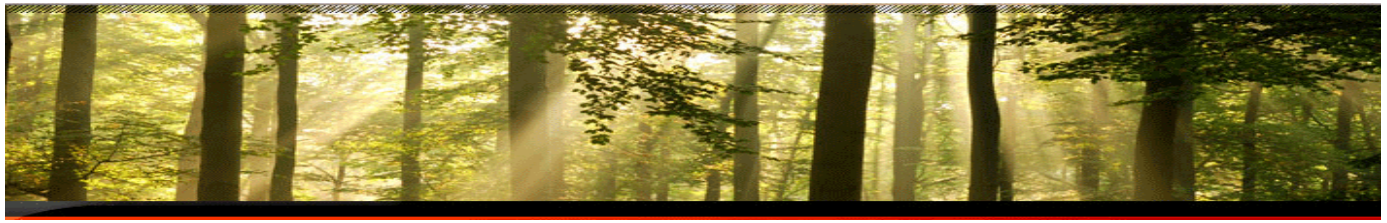
Resource Adequacy: Squaring the Circle?

Tamara Linde
Vice President Regulatory- PSEG
Harvard Electricity Policy Group
December 6, 2012

PSEG

Public Service Enterprise Group Inc. (PSEG)

- PSEG is a publicly traded, diversified energy company with annual revenues of more than $11 billion
  - New Jersey's oldest and largest regulated electric and gas delivery utility, providing service to 2.2 million electric customers and 1.8 million gas customers
  - Transmission owner in the PJM region
  - One of the largest competitive power producers in the U.S., with a portfolio that includes approximately 13,000 megawatts of generating capacity
  - Portfolio of both utility and non-utility solar investments
- For the past two years, PSEG has been named to the Dow Jones Sustainability Index (DJSI – World Index) and Carbon Disclosure Leadership Index (CDLI)
- PSE&G named America's Most Reliable Electric Utility for the 5th time in eight years and winner of regional award for the 11th straight year
- Reflecting our strong history of environmental leadership, PSEG has pursued a low-carbon business strategy for over 15 years



PSEG

Reliability Pricing Model (RPM)

- Implemented in 2007 as the mechanism to attract and retain capacity needed to ensure the continued reliability of the regional power grid at the lowest possible cost

- The RPM model has worked well
  - Resource adequacy maintained at price below cost of new entry
  - Maintained adequate reserve levels
  - Adapted well to evolving challenges and diverse mix of market participants and resources

- Lessons learned and continued efforts to improve

Experience in PJM: What has Worked Well and What Needs to be Improved

WORKING WELL

- Forward looking
- Locational design
- Seller-side market power mitigation
- Flexibility to attract diverse and evolving capacity resource mix
- Interaction between PJM and IMM
- Back-stop mechanism

IMPROVEMENTS UNDER CONSIDERATION

- Buyer side market power mitigation
- Duration of payment
- Hold back for DR
- Rules for participation of DR
- Coordination with transmission planning

Buyer Side Market Power: Minimum Offer Price

- MOPR modified by FERC in 2011
  - Removed state reliability exception
  - Added unit specific cost based exception process
  - FERC Order appealed by diverse stakeholder groups

- Revised MOPR applied in May 2012 auction
  - Three of four state subsidized units cleared based on unit specific exception process
  - Significant dissatisfaction with how new rules worked
    - Lack of transparency
    - Apparent ease in which applicant could reduce unit specific bid

- Diverse Stakeholder Group Proposal to modify MOPR
  - Significant revisions including
    - Elimination of unit specific bid exception
    - Creation of two categories of exemptions – Self supply and competitive entry
    - All others must clear auctions for three separate delivery years at 100% net cone
    - Specific Reliability Exemption – Reduces duration to one year
  - Presented to Stakeholders – 89.4% voted in favor

Other Improvements Under Consideration

- Demand Response
  - Hold Back
  - Product Comparability
    - Availability, physical commitment, reporting, auditing, penalties for non-performance
- Duration
  - Should the one year duration be extended for some portion?
    - Generation development
    - Cash flow certainty
    - Price discovery
  - Currently evaluating several multi-year pricing mechanisms and the challenges, including credit, volatility, interaction with base auction
  - PJM Target: May 31, 2013 FERC filing
- Coordination with Transmission Planning

Looking Forward

- RPM will continue to play important role in PJM market
- Regulatory certainty vs. continued improvement can be balanced, like so many other elements of our industry, RPM will and should continue to evolve and improve

Appendix

PSEG

RPM's Impact to Date

Table 10 – RPM's Impact to Date

Change in Capacity Availability	Installed Capacity MW
New Generation	15,136.3
Generation Upgrades (not including reactivations)	5,696.8
Generation Reactivation	538.7
Forward Demand and Energy Efficiency Resources	20,589.2
Cleared ICAP from Withdrawn or Canceled Retirements	4,173.5
Net increase in Capacity Imports	6,046.9
Total Impact on Capacity Availability in 2015/2016 Delivery Year	**52,181.4**

RPM Auction - Generation

Table 2A –Incremental Capacity Resource Increases

	RTO									
Capacity Changes (in ICAP)	2007/2008	2008/2009	2009/2010	2010/2011	2011/2012	2012/2013	2013/2014	2014/2015	2015/2016	Total
Increase in Generation Capacity	602.0	724.2	1,272.3	1,776.2	3,576.3	1,893.5	1,737.5	1,582.8	8,207.0	21,371.8

Table 2B –Location of Generation Capacity Increase (in ICAP MW)

LDA Name	Gen Capacity Increase
EMAAC	3528.5
MAAC	4576.2
Total RTO	8207

**All Values in ICAP terms
*MAAC includes EMAAC
**RTO includes MAAC

Of the 8,207 MW increase in capacity resources, new generation accounted for 4,898 MW, comprised of merchant and state subsidized.

Table 2C – Offered and Cleared New Generation Capacity by LDA (in UCAP MW)

	Offered			Cleared		
LDA	Uprate	New Unit	Total	Uprate	New Unit	Total
EMAAC	180.7	3,145.9	3,326.6	164.9	2,313.5	2,478.4
MAAC	220.7	4,105.5	4,326.2	189.5	2,990.7	3,180.2
Total RTO	478.6	6,843.7	7,322.3	447.4	4,898.9	5,346.3

*All MW Values are in UCAP Terms
*MAAC includes EMAAC
**RTO includes MAAC

RPM Auction – Demand Response

Table 3A – Comparison of Demand Resources Offered and Cleared in 2014/15 BRA & 2015/16 BRA represented in UCAP

		Offered MW*			Cleared MW*		
LDA	Zone	2014/2015	2015/2016	Increase in Offered MW	2014/2015	2015/2016	Increase in Cleared MW
EMAAC	AECO	268.2	249.2	(19.0)	205.4	207.9	2.5
EMAAC/DPL-S	DPL	470.9	524.3	53.4	391.5	433.5	42.0
EMAAC	JCPL	553.0	524.0	(29.0)	444.0	350.2	(93.8)
EMAAC	PECO	992.4	1,458.1	465.7	830.5	801.8	(28.7)
PSEG/PS-N	PSEG	1,140.1	1,081.9	(58.2)	964.2	796.1	(168.1)
EMAAC	RECO	42.0	37.4	(4.6)	31.2	20.9	(10.3)
EMAAC Sub Total		3,466.6	3,874.9	408.3	2,866.8	2,610.4	(256.4)
PEPCO	PEPCO	1,022.5	966.4	(56.1)	893.1	867.4	(25.7)
SWMAAC	BGE	1,450.9	1,328.8	(122.1)	1,341.3	1,141.7	(199.6)
MAAC	METED	469.9	472.2	2.3	398.4	348.6	(49.8)
MAAC	PENELEC	498.6	710.7	212.1	437.7	525.6	87.9
MAAC	PPL	1,505.3	1,810.3	305.0	1,299.5	1,155.0	(144.5)
MAAC** Sub Total		8,413.8	9,163.3	749.5	7,236.8	6,648.7	(588.1)
RTO	AEP	1,665.4	2,175.6	510.2	1,635.1	1,684.4	49.3
RTO	APS	912.0	1,175.1	263.1	886.8	935.5	48.7
ATSI	ATSI	1,055.1	2,038.5	983.4	955.7	1,763.7	808.0
RTO	COMED	1,546.9	2,765.9	1,219.0	1,535.7	1,698.2	162.5
RTO	DAY	265.1	324.8	59.7	231.9	196.9	(35.0)
RTO	DEOK	60.4	358.8	298.4	54.6	278.9	224.3
RTO	DOM	1,381.3	1,653.1	271.8	1,359.5	1,381.8	22.3
RTO	DUQ	245.6	301.2	55.6	222.3	244.7	22.4
Grand Total		15,545.6	19,956.3	4,410.7	14,118.4	14,832.8	714.4

DR followed price signals, with all of the increase in the ATSI zone

RPM Auction – Energy Efficiency

Table 3C – Comparison of Demand Resources and Energy Efficiency Resources Offered versus Cleared in the 2015/16 BRA represented in UCAP

		Offered MW*			Cleared MW*		
LDA	Zone	Demand	EE	Total	Demand	EE	Total
EMAAC	AECO	249.2	1.6	250.8	207.9	1.2	209.1
EMAAC/DPL-S	DPL	524.3	16.2	540.5	433.5	15.5	449.0
EMAAC	JCPL	524.0	-	524.0	350.2	-	350.2
EMAAC	PECO	1,458.1	20.8	1,478.9	801.8	14.8	816.6
PSEG/PS-N	PSEG	1,081.9	11.9	1,093.8	796.1	10.7	806.8
EMAAC	RECO	37.4	-	37.4	20.9	-	20.9
EMAAC Sub Total		3,874.9	50.5	3,925.4	2,610.4	42.2	2,652.6
PEPCO	PEPCO	966.4	56.2	1,022.6	867.4	55.8	923.2
SWMAAC	BGE	1,328.8	103.6	1,432.4	1,141.7	103.6	1,245.3
MAAC	METED	472.2	4.1	476.3	348.6	3.4	352.0
MAAC	PENELEC	710.7	4.1	714.8	525.6	3.4	529.0
MAAC	PPL	1,810.3	18.7	1,829.0	1,155.0	14.2	1,169.2
MAAC** Sub Total		9,163.3	237.2	9,400.5	6,648.7	222.6	6,871.3
RTO	AEP	2,175.6	213.9	2,389.5	1,684.4	213.9	1,898.3
RTO	APS	1,175.1	0.8	1,175.9	935.5	0.8	936.3
ATSI	ATSI	2,038.5	48.1	2,086.6	1,763.7	44.9	1,808.6
RTO	COMED	2,765.9	422.4	3,188.3	1,698.2	422.4	2,120.6
RTO	DAY	324.8	2.0	326.8	196.9	2.0	198.9
RTO	DEOK	358.8	4.6	363.4	278.9	4.6	283.5
RTO	DOM	1,653.1	7.2	1,660.3	1,381.8	7.2	1,389.0
RTO	DUQ	301.2	4.1	305.3	244.7	4.1	248.8
Grand Total		19,956.3	940.3	20,896.6	14,832.8	922.5	15,755.3

Energy Efficiency remains a viable, albeit small capacity resource in PJM

RPM Auction – Supply by LDA

Table 4 –RPM Base Residual Auction Clearing Results in the LDAs

Auction Results	RTO	MAAC	SWMAAC	PEPCO	EMAAC	DPL-SOUTH	PSEG	PS-NORTH	ATSI
Offered MW (UCAP)	178,587.7	74,260.5	12,721.9	6,235.1	37,228.4	1,787.7	8,964.1	4,930.5	11,777.1
Cleared MW (UCAP)	164,561.2	65,790.4	10,999.8	6,135.7	33,047.7	1,722.1	6,729.8	3,841.2	10,687.8
System Marginal Price	$118.54	$118.54	$118.54	$118.54	$118.54	$118.54	$118.54	$118.54	$118.54
Locational Price Adder*	$0.00	$31.46	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$186.08
Extended Summer Price Adder**	$17.46	$17.46	$17.46	$17.46	$17.46	$17.46	$17.46	$17.46	$17.46
Annual Price Adder	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$34.92
Resource Clearing Price for Limited Resources	$118.54	$150.00	$150.00	$150.00	$150.00	$150.00	$150.00	$150.00	$304.62
Resource Clearing Price for Extended Summer Resources	$136.00	$167.46	$167.46	$167.46	$167.46	$167.46	$167.46	$167.46	$322.08
Resource Clearing Price for Annual Resources	$136.00	$167.46	$167.46	$167.46	$167.46	$167.46	$167.46	$167.46	$357.00

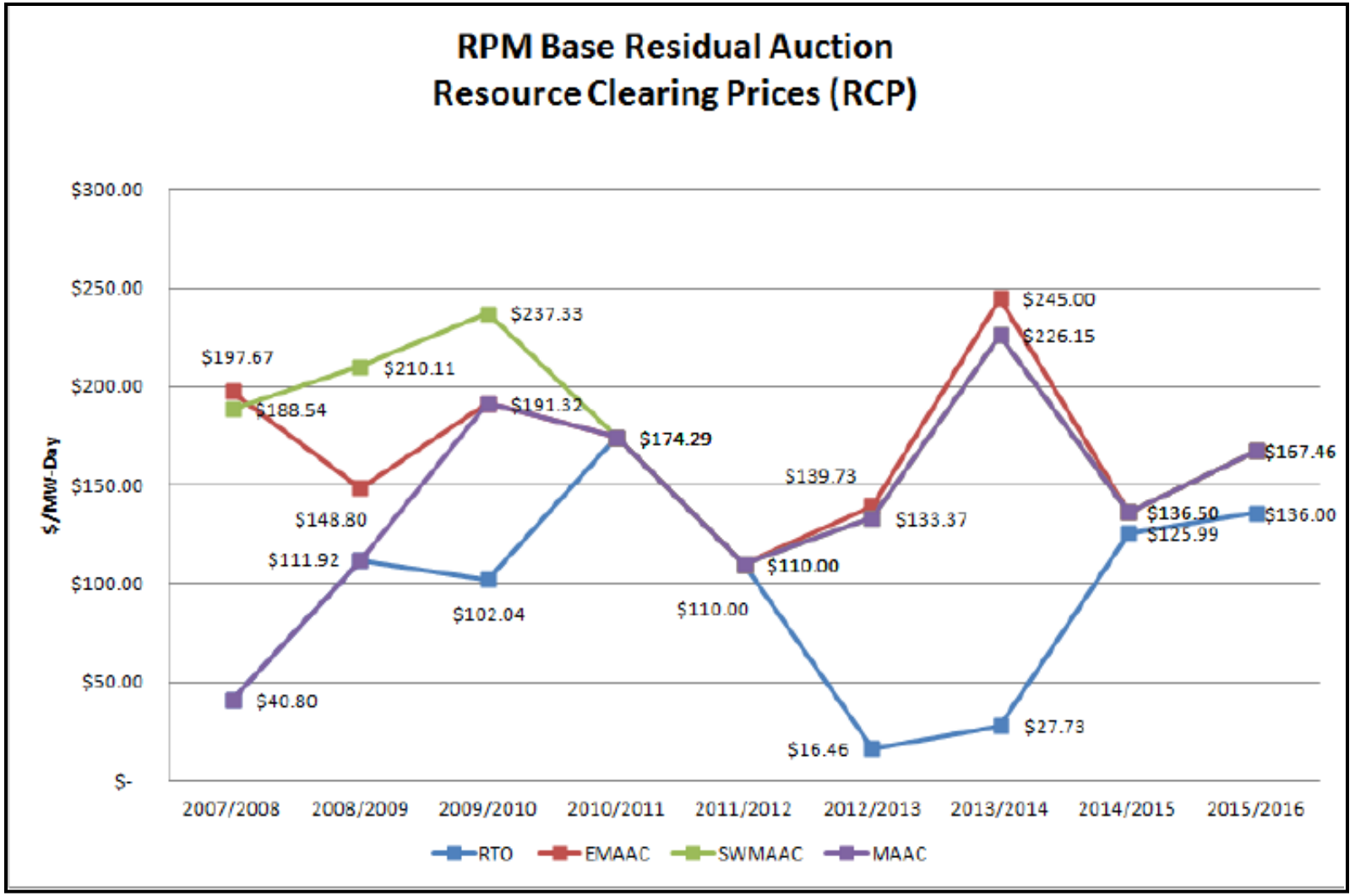
*Locational Price Adder is with respect to the immediate parent LDA

**Annual Resources and Extended Summer DR receive the Extended Summer Price Adder

- **RPM continued to prove to be an effective mechanism for reliable supply of capacity**
- **Strong reserve margins and capacity offers in excess of market need.**

PSEG

RPM Auction - Pricing



Auction results remained moderate in the face of considerable retirements No split in PS North, ATSI split to $357/MW-day

PSEG