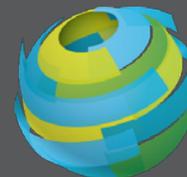


Federal Energy Regulatory Commission
Docket No. AD14-14 - Uplift Workshop
September 8, 2014
Panel #2: Impacts on Market Participants
Panelist: John Rohrbach

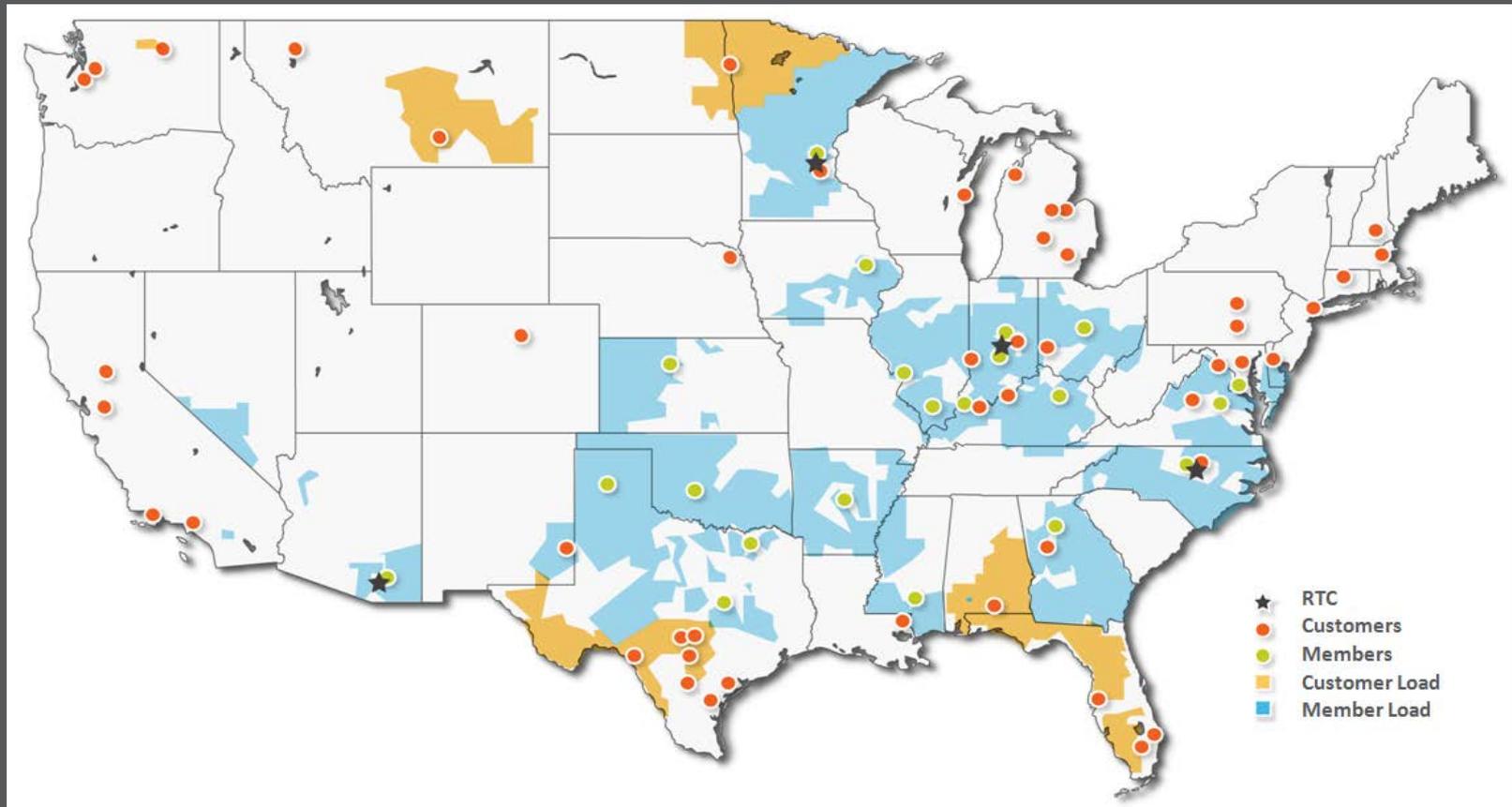


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ACES' Footprint – Member G&T Cooperatives and Customers



ACES serves its Electric Cooperative Members & Customers in five RTOs/ISOs (four jurisdictional), managing 50,000 MW of load and resources and scheduling up to 3 Bcf/day of natural gas for electric generating resources. This presentation focuses on PJM uplift.



Presentation Topics



- Three broad topics (below) were suggested for Panel # 2 in the August 14, 2014 Supplemental Notice. Sub-issues were added.
- Four Summary conclusions are made in the next set of slides.
 1. Uplift transparency provided by RTOs/ISOs (RTOs) and market monitoring units (MMUs).
 - What is the purpose of uplift data generated by RTOs and the MMU?
 - What is the quality, transparency and usefulness of this RTO/MMU data?
 2. Price distortions resulting from out-of-market payments.
 - How does uplift distort RTO market outcomes?
 - Which uplift charges are likely candidates for capturing in markets vs. when is uplift preferable to remain as-is?
 3. Level and volatility or unpredictability of uplift charge(s).
 - Is there a predictable pattern in uplift charges?
 - Are spikes in uplift predictable, and if so, can an LSE manage such uplift?

1). Value of RTO/MMU Uplift Data:

- RTO/MMU uplift data can be valuable in uncovering the causes of two types of uplift:
 - Extreme Uplift: January 2014-type uplift
 - Persistent Uplift: Reactive and Black Start, etc.
- Extreme Uplift vs. Persistent uplift: is relatively easier to explain, whereas Persistent Uplift appears shrouded in confidentiality, making it less subject to reform either through transmission planning, via new entry or member concern.
- This leads to the next conclusion.

2). Transparency:

- RTOs and MMUs should release energy market uplift data with as much detail as is possible to enable an RTO's market participants to evaluate and propose uplift solutions.
- In this regard, the PJM Market Monitor's most recent State of the Market report (2Q 2014) states :

“Current confidentiality rules prevent the publication of detailed data concerning the reasons and locations of these [uplift] payments, making it difficult for other participants to compete with the resources receiving energy uplift payments. The confidentiality rules were implemented in order to protect competition. The application of confidentiality rules in the case of energy uplift information does exactly the opposite.”

(Emphasis Added) (2nd Quarter PJM State of the Market, Sec. 4, p. 153)

3). Uplift Distortions:

- For load, uplift charged on a reliability basis is an “after the fact” basis so it cannot be avoided.
- For uplift charged on a deviations basis the LSE has greater control over what it is charged but this charge is also unhedgeable if RT load deviates +/- from its DA schedule.
- Even if an some uplift charges are correlated with the weather or LMP, uplift assignment is complicated.
- For generating resources, make-whole payments present a mitigated, cost-based investment signal that is inferior to revenue streams channeled through than an RTO’s markets.
- However, as indicated in an example below, changes to PJM market to eliminate uplift can cost more than uplift itself.

4). Uplift Unpredictability:

- Uplift in January 2014 jumped by as much as 3697% (as compared to an average January) for uplift incurred for Reliability purposes.
- Aggregate January 2014 uplift increased by 850% as compared to an average month pre-and-post January 2014.
- Despite this January 2014 uplift, uplift as a % of PJM aggregate charges is relatively stable at 2.7% in January 2014, 3% for 2013, and 1.6% to 1.9% for 2010 – 2012.
- What this statistic does not address is how uplift is charged to various customer loads under current uplift allocation rules.
- Proposals to simplify the cost allocation process to a “single rate” is currently under review at the PJM stakeholder level.

1. Uplift Transparency



Example of “Extreme Uplift” transparency: Below is a table showing Uplift allocated as BOR for Reliability for gas units committed in the January 2014 Polar Vortex and Winter Storms on a Conservative Operations basis. The table was created with content from the 2014 1Q PJM State of the Market Report. Note ~ \$171 MM in uplift for off-peak hours; ~ \$61 MM in on-peak hours:

Date:	8 On-Peak Hours (HE 8-11, 18-21)			16 Off-Peak Hours			c
	MW		Make-Whole	MW		Make-Whole	
January 8	2400	\$	5,326,080	2200	\$	15,466,880	\$ 20,792,960
January 22	5800	\$	12,871,360	5000	\$	35,152,000	\$ 48,023,360
January 23	5100	\$	11,317,920	5000	\$	35,152,000	\$ 46,469,920
January 24	4300	\$	9,542,560	4100	\$	28,824,640	\$ 38,367,200
January 25	2300	\$	5,104,160	2100	\$	14,763,840	\$ 19,868,000
January 28	7700	\$	17,087,840	5900	\$	41,479,360	\$ 58,567,200
Totals		\$	61,249,920		\$	170,838,720	\$ 232,088,640

Source: Panelist calculations using Data from PJM State of the Market Report for 1st Quarter 2014 published by Monitoring Analytics, Section 4, page 173 (stating that PJM units receiving uplift were non-economic by an average of \$277.4/MWh in on-peak and by an average of \$439.4/MWh during off peak and indicating in Figure 4-9 capacity committed for conservative ops. Jan. 8, 22-25 and 28).

2. Uplift Price Distortions



- Price distortions resulting from uplift payments can pressure an RTO into trying to reflect uplift charges in an RTO's markets.
- Eliminating uplift, especially episodic spikes in uplift, can be more costly than uplift itself.
- As an example, to eliminate the \$171 MM in off-peak generator uplift costs incurred on 6-days in January in previous slide, the pipeline inflexibility and ratable take requirement issues that prevented these gas units from reducing output during off-peak periods (thus causing the uplift) would need to be remedied.
- Specifically, new gas pipeline investment, with Firm Transport or enhanced marketer services might be needed.
- If such demand charges were reflected these costs in the PJM Market, what would the cost and benefits look like?

2. Uplift Price Distortions



Pipeline Operator Name	Status	Yr. in Service	State(s)	Region(s)	Cost (millions)	Miles	Add'nl. Capacity (MMcf/d)
Constitution Pipeline Co	Filed	2015	PA,NY	Northeast	683	121	650
Iroquois Pipeline Co	Announced	2014	NJ,NY	Northeast	500	66	500
Dominion Transmission	Completed	2012	WV,PA	Northeast	635	110	484
Equitrans	Completed	2012	WV,PA	Northeast	272	50	314
Empire Pipeline	completed	2011	PA,NY	Northeast	47	15	350
Millennium Pipeline	Completed	2008	NY	Northeast	664	182	525
PNGTS/Maritimes & Northeast	Completed	1999	ME,NH,MA	Northeast	175	100	632

- The above northeast gas pipeline projects can be used as an indicator of new pipeline infrastructure. The cost, escalated to 2018 DY dollars is \$3.66B; on a revenue requirement basis the demand charge would be \$.606 Dth-day (depreciation, return on rate base, taxes, O&M, A&G).
- This demand charge could also be used to represent upper bound of the incremental cost of a marketer arrangement for a shipper with FT where delivery of fuel is assured and marketer assumes a ratable take requirement risk.

Source: EIA Pipeline Projects Database.

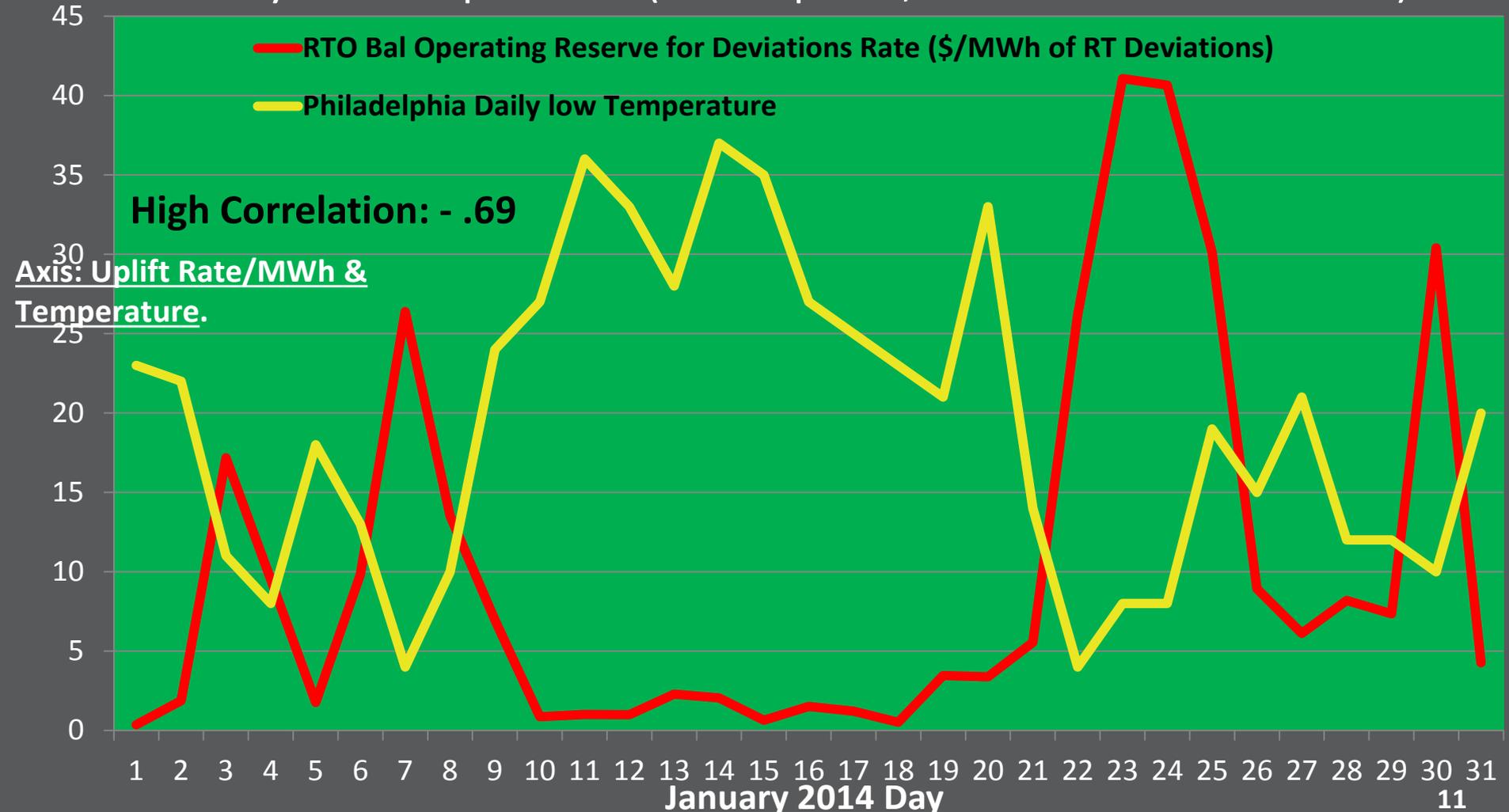
2. Uplift Price Distortions



- Recall that a max. of 6,000 MW of gas generation rec'd. \$171 MM in uplift for off-peak operations on six days in January 2014. This generating capacity was unable to flex down due to a pipeline ratable take requirement or similar pipeline restriction.
- If new pipeline capacity were built (or a service reserved with a marketer), ~ 1,584,000 Dth-day of capacity would need to be reserved (6000 MW * 11 Heat Rate* 24 hours/day).
- This would result in ~ \$350.2 MM/year in new demand charges (\$.606 Dth-day * 1,584,000 Dth per day requirement).
- Assuming recovery via PJM OATT Attachment DD Section 6.8, RPM charges would increase by ~ \$350 MM. Thus, to eliminate \$171 MM in off-peak uplift occurring once every ten years (Jan. 2014 was a '1 in 10 event'), each year PJM load would pay ~ 2x incurred uplift (perhaps higher if the CTs set the price in the BRA).

3. Uplift Unpredictability

PJM January 2014 Daily BOR Deviations Rate: correlated with Philadelphia daily low temperature (as temp. fell, BOR dev. rate increased)



3. Uplift Unpredictability



January 2014 Uplift was significant and presented load with challenges that could not be hedge in advance (\$ in Millions)

Uplift Charge Category	Avg. mo. uplift charge Jan. 2013 - June 2014 (excl. Jan. 2014)	Jan-14	Jan-13	Jan-12	Jan-11	Jan-10	Typical Jan. (Jan. 2010-Jan .2013 Avg.)	% Increase in Jan. 2014 vs. "typical January"	% Increase in Jan. 2014 vs. Avg. month pre-& post Jan. 2014 (12 prior, 5 post)
DA Operating Reserve	\$6.83	\$35.80	\$11.10	\$8.31	\$12.37	\$10.28	\$10.52	240%	424%
Balancing Op. Reserve - Reliability	\$6.24	\$386.90	\$13.83	\$7.29	\$11.95	\$7.69	\$10.19	3697%	6099%
Balancing Op. Reserve-Deviations	\$25.75	\$177.04	\$65.33	\$19.33	\$34.83	\$29.41	\$37.23	376%	588%
Reactive	\$19.39	\$3.80	\$23.60	\$2.93	\$1.55	-	\$9.36	-59%	-80%
Black Start & Synch. Condensing	\$5.73	\$4.10	\$10.32	\$0.03	\$0.11	\$0.05	\$2.63	56%	-28%
Totals	\$63.95	\$607.70	\$124.18	\$37.89	\$60.81	\$47.43	\$71.59	769%	850%

Source: PJM MMU 2010-2013 Annual PJM State of the Market Reports, 2014 Quarterly State of the Market Report and August 25th 2014 BOR charge summary document.

3. Uplift Unpredictability



PJM Uplift charge allocation “Cheat Sheet”

Uplift charge type	Charged to RTO Load	Charged to East Load	Charged to West Load
<u>DA Operating Reserves:</u>			
DA OR Rate paid to generating resources, imports and economic DR:	DA Load DA Exports Dec. Bids	n/a (all charged RTO basis)	n/a (all charged RTO basis)
<u>Balancing Operating Reserves</u> (Committed in Reliability Analysis or RT):	<u>MWh in Deviations denominator:</u> LSE’s positive or negative changes from its DA-schedule. <u>MWh in Reliability denominator:</u> RTO, East or West RT load and exports		
Balancing OR rate paid to generating resources:	Deviations or Reliability	Deviations or Reliability	Deviations or Reliability
BOR allocation to Deviations vs. Reliability:	<u>Allocated to Reliability if:</u> a.) in RA need is Conservative Operations or b). RT need is due to 345 kV (and above) transmission constraint. <u>Allocated to Deviations if:</u> a.) need in RA period is for Load plus reserves or b.) in RT if need is due to a constraint at 345 kV (and lower voltages).		
Lost Opportunity Credits, cancelled resources, certain imports, quick start:	Deviations	Deviations	Deviations

Sources: Adapted from PJM BORCA chart, PJM MMU 2nd Quarter State of the Market Report.

3. Uplift Unpredictability



Persistent Uplift can be volatile:
Monthly average uplift charges for
Reactive and Black Start services

Category	2014	2013	2012
Reactive	\$1,850,611	\$28,290,170	\$6,334,000
Black Start	\$1,193,213	\$7,216,146	\$698,721*

2012 – only 1 month of Black start charges as
Black start was in separate uplift categories.

Source: PJM MMU 2012-2013 Annual PJM State of the Market Reports
and 2014 Quarterly State of the Market Reports.

3. Uplift Unpredictability



For Persistent Uplift:

- In PJM’s RTEP transmission planning process, projects are separated as to “reliability” and “market efficiency” projects.
- Market Efficiency projects are evaluated comparing savings in energy and capacity benefits including congestion.
- However, generating units that receive uplift typically depress energy prices and therefore reduce congestion. Energy uplift is thus not taken into account in this analysis.
- PJM’s market efficiency planning process should be reformed to include an analysis that evaluates transmission projects that reduce the need to run resources out of merit.

Source: Adapted from PJM Energy Market Uplift Senior Task Force, MMU recommendation.

3. Uplift Unpredictability



However, PJM Uplift as whole (inclusive of the 1st six months of January 2014) as a % of total billings, is relatively stable.

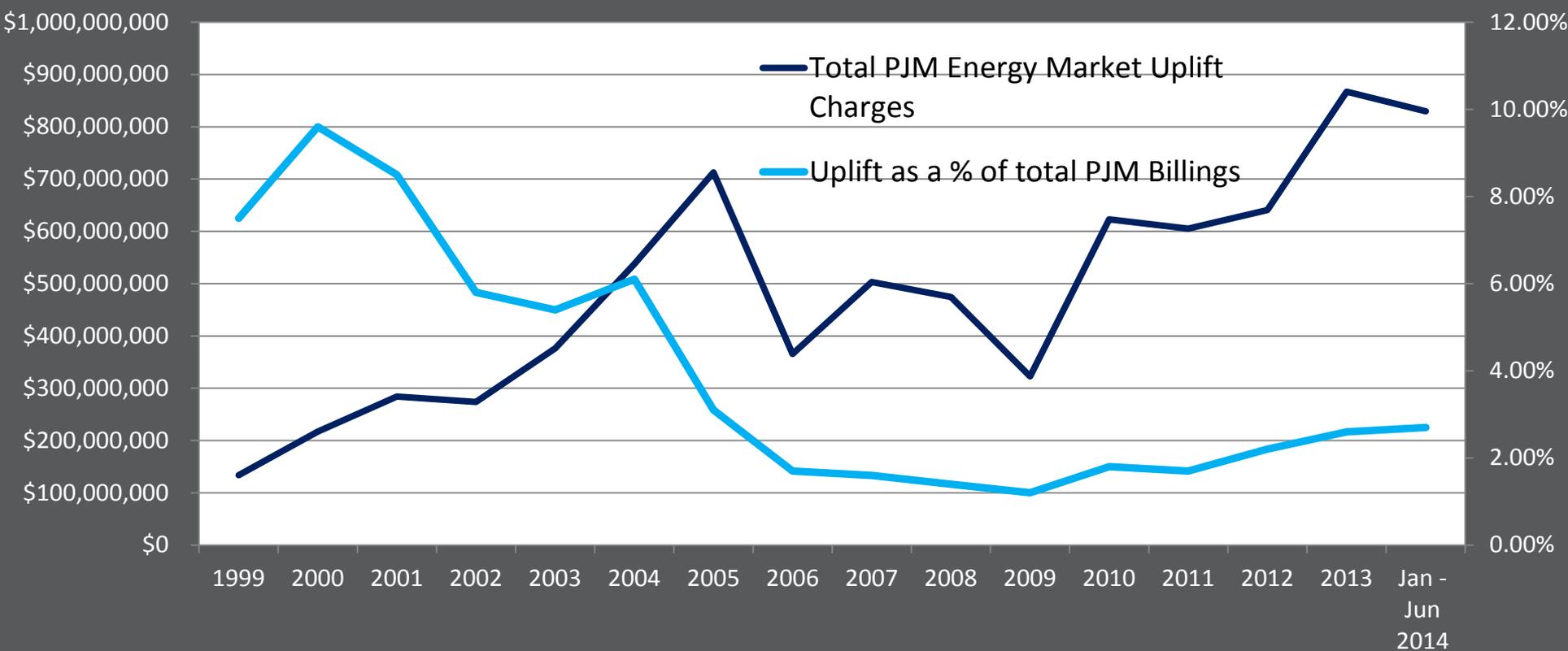
Period	2014 (6 mos.)	2013	2012	2011	2010
Total Billings (\$Bil.)	\$31.06	\$29.18	\$33.86	\$35.9	34.77
Uplift (\$Bil.)	\$.8295	\$.8822	\$.6508	\$.5781	\$.5477
Uplift as a % of total Billings	2.671%	3.023%	1.922%	1.610%	1.575%

Source: PJM MMU 2010-2013 Annual PJM State of the Market Reports and 2014 Quarterly State of the Market Report.

3. Uplift Unpredictability



Over the long term, PJM uplift has substantively improved.



Source: August 28, 2014 PJM Energy Market Uplift Senior Task Force (using MMU data).

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