Federal Energy Regulatory Commission
June 20, 2013
Commission Meeting

A-3: Capacity Deliverability Across MISO/PJM Seam (AD12-16-000)

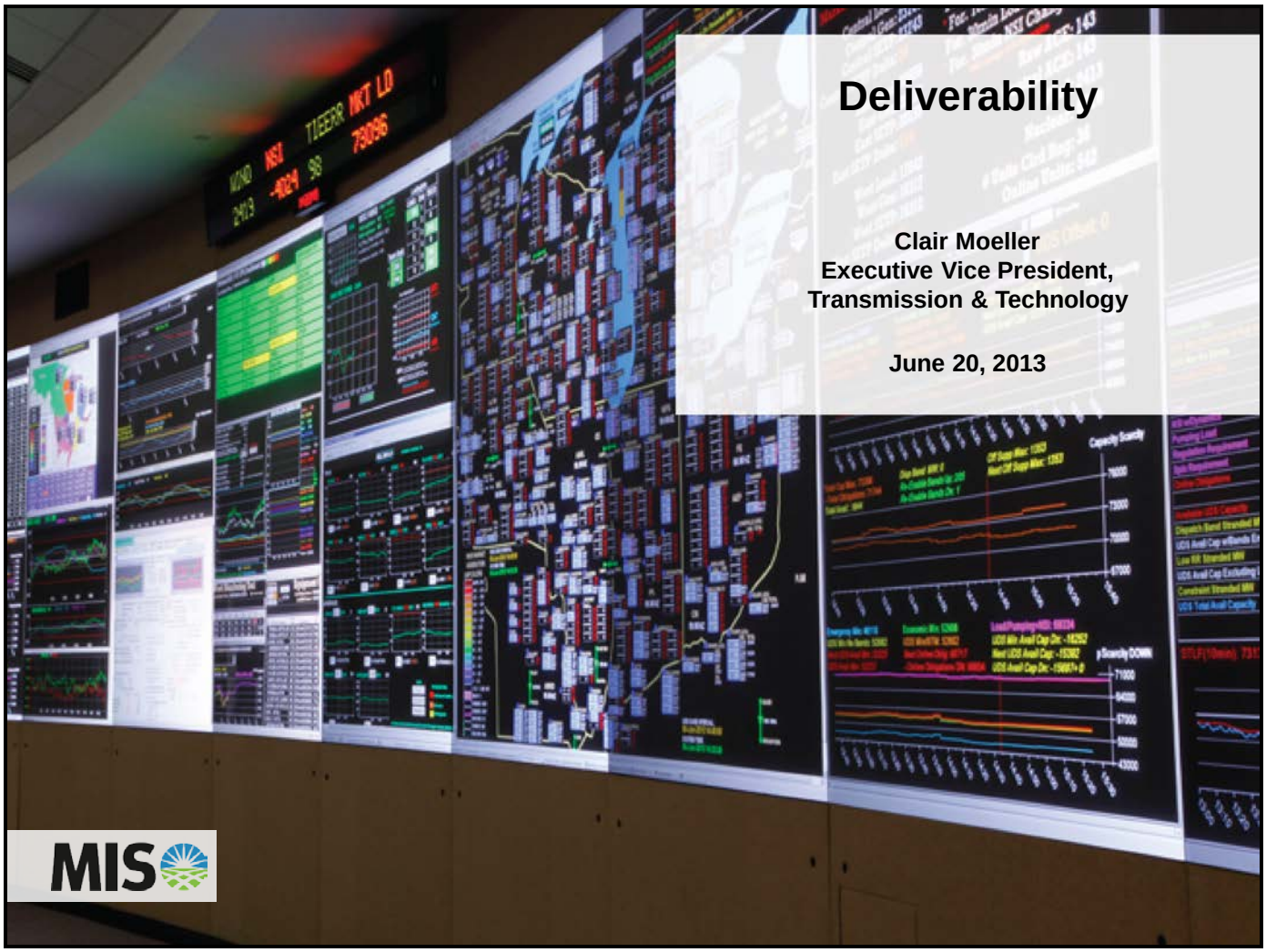
Presenters:

- Mr. Clair Moeller (MISO)*
- Mr. Andrew Ott (PJM)*
- Commissioner Kari Bennett (Opening Statement for OMS-OPSI Jointly)
  (Note: will only be introducing Chairman Montgomery and Commissioner White)
- Chairman Phil Montgomery and Commissioner Greg White (OMS-OPSI Jointly)*
  (Note: Joint written remarks that will be filed are also included in this package)
- Dr. David Patton (MISO Market Monitor)*
- Dr. Joseph Bowring (PJM Market Monitor)*

*PPT

Presentation by: Mr. Clair Moeller (MISO)

Slide 1

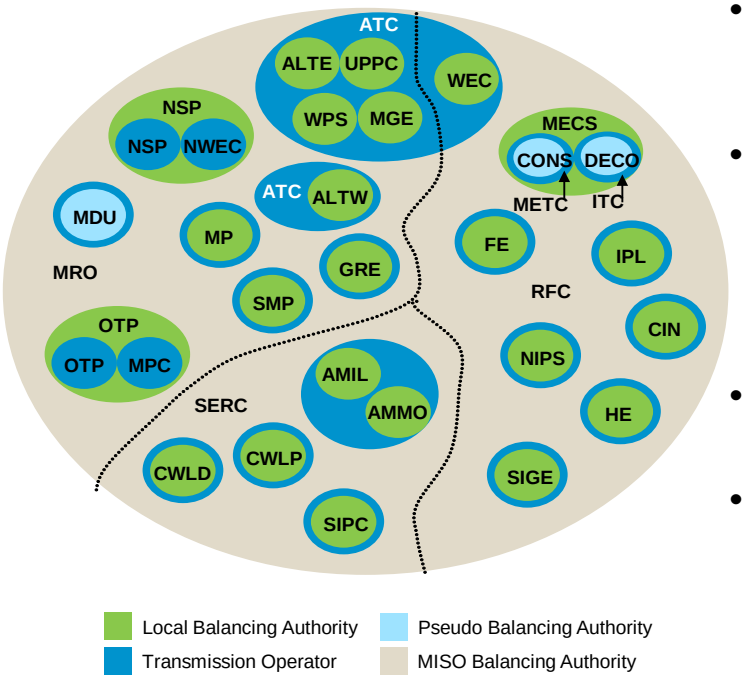


RTOs are designed to provide consumers with reliable, low cost energy through open access to the transmission grid – constrained only by actual physical limits

- MISO and PJM have created significant value by seamlessly integrating the utilities, balancing authorities, and other industry entities within each of the RTOs' borders
- MISO and PJM have also coordinated to produce consumer benefit by reducing barriers to efficient transmission utilization at the MISO/PJM border
- However, additional opportunities to increase consumer benefits have been identified but progress to capture these has been slow
- MISO respectfully requests FERC act to ensure all these opportunities are pursued and realized

RTOs provide benefits by optimizing a complex set of regional assets

Balancing Authority Consolidation



How RTO benefits are achieved

- Improved reliability
  - Modern control computers see the entire system
- More efficient use of existing assets
  - Change from point-to-point to network firm transmission
  - Optimization of regional supply
- Reduced need for new resources
  - Resource sharing
- Regional shared use of assets
  - Fully utilizing the existing transmission system across historic administrative borders

MISO

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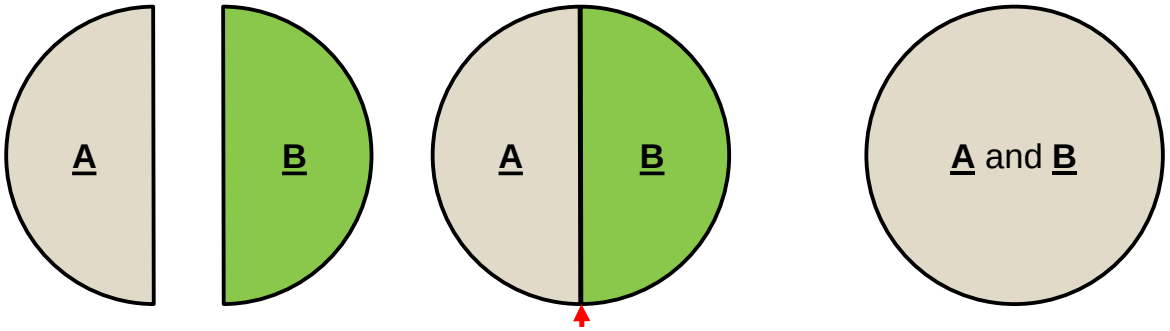
Deliverability is the utilization of the transmission system between RTOs in the same manner it is utilized inside each RTO

	"AS IS"		"SHOULD BE"	
	Within RTO	Between RTOs	Within RTO	Between RTOs
Methodology:	• Network Transmission • Simultaneous Deliverability	• Point-to-Point Transmission • Incremental Deliverability	• Network Transmission • Simultaneous Deliverability	



Transmission Service Border / Seam

All resources within a single RTO (A or B) loaded at the same time	All resources in "A" loaded then incrementally review those in "B"	All resources within AND between RTOs (A and B) loaded at the same time

This is the same change that each RTO made when they consolidated Balancing Authorities

MISO

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Addressing deliverability prior to 2016 will promote efficient and timely resource additions

- Additional benefits include:
  - Order 1000 Consistency: Cross-border transmission analysis is performed on a combined network basis –point to point tariff administration is inconsistent
  - Reliability: All available resources should be used to maintain reliability unless a physical constraint prevents
  - Price transparency: Assist market participants and state regulators as they consider options to efficiently manage resource adequacy challenges
  - Flexibility: Generators can participate in either market
  - Reduce long-term price volatility: broader access means lower capacity price volatility
  - Resource diversity: Facilitates potential generation investment in Marcellus Shale region to enable “gas by wire”

Optimizing deliverability enables the reliable delivery of the lowest-cost energy to consumers

MISO

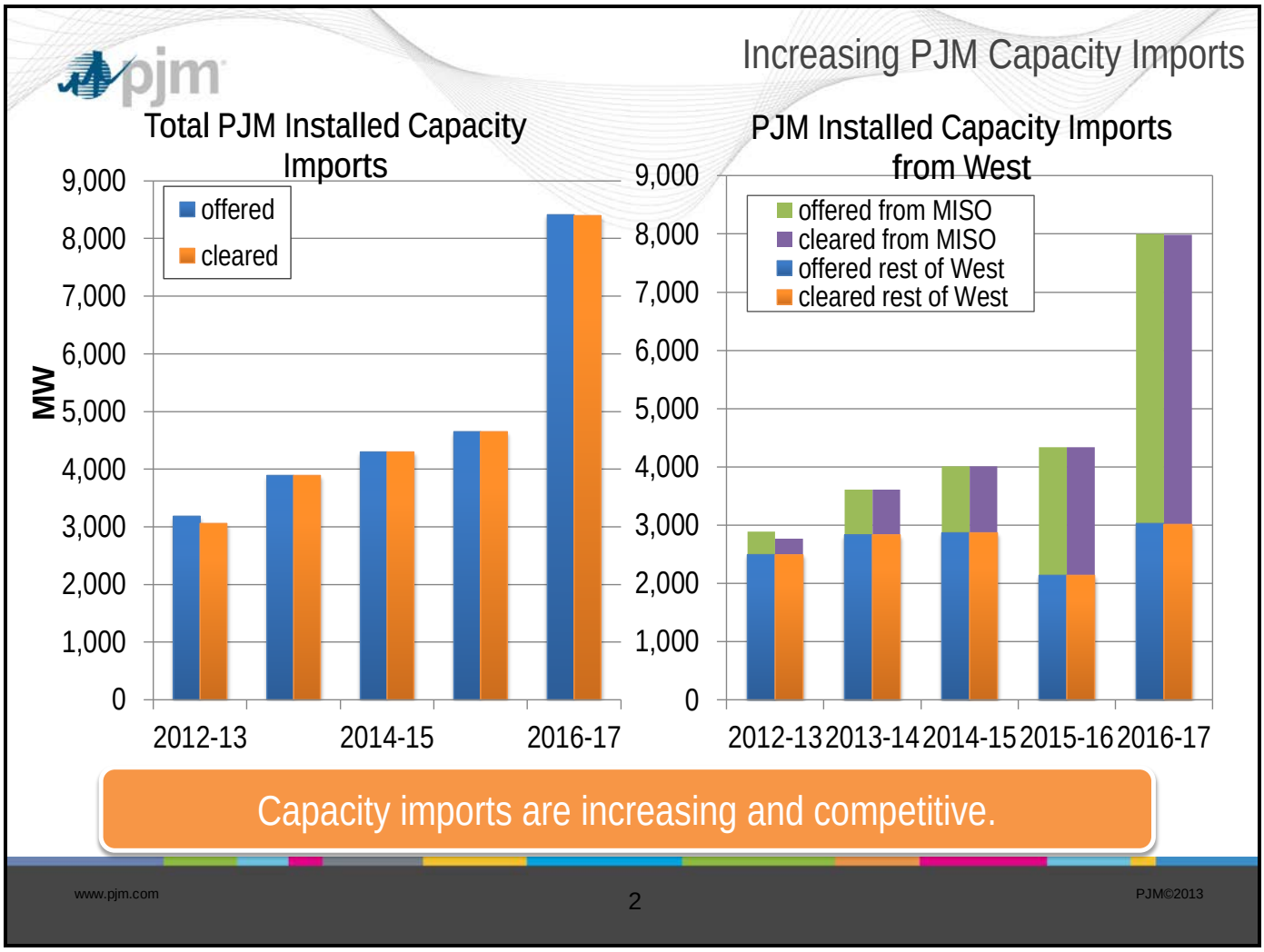
MISO requests the reinvigoration of FERC's oversight of the Joint and Common Market proceeding

- Process should include requirements that ensure:
  - Ongoing participation of state regulatory community (Organization of MISO States and Organization of PJM States)
  - Timely evaluation and removal of barriers to full transmission utilization
    - Dedication of MISO and PJM resources to develop solutions
    - Involvement of MISO and PJM stakeholders
  - Filing of JOA tariff changes necessary to implement solutions
  - A schedule and periodic reports to FERC

Presentation by: Mr. Andrew Ott (PJM)

Slide 1

Slide 2


Increasing PJM Capacity Imports
Total PJM Installed Capacity Imports
MW
9,000
8,000
7,000
6,000
5,000
4,000
3,000
2,000
1,000
0
offered
cleared
2012-13
2014-15
2016-17
PJM Installed Capacity Imports from West
offered from MISO
cleared from MISO
offered rest of West
cleared rest of West
2012-13
2013-14
2014-15
2015-16
2016-17
Capacity imports are increasing and competitive.
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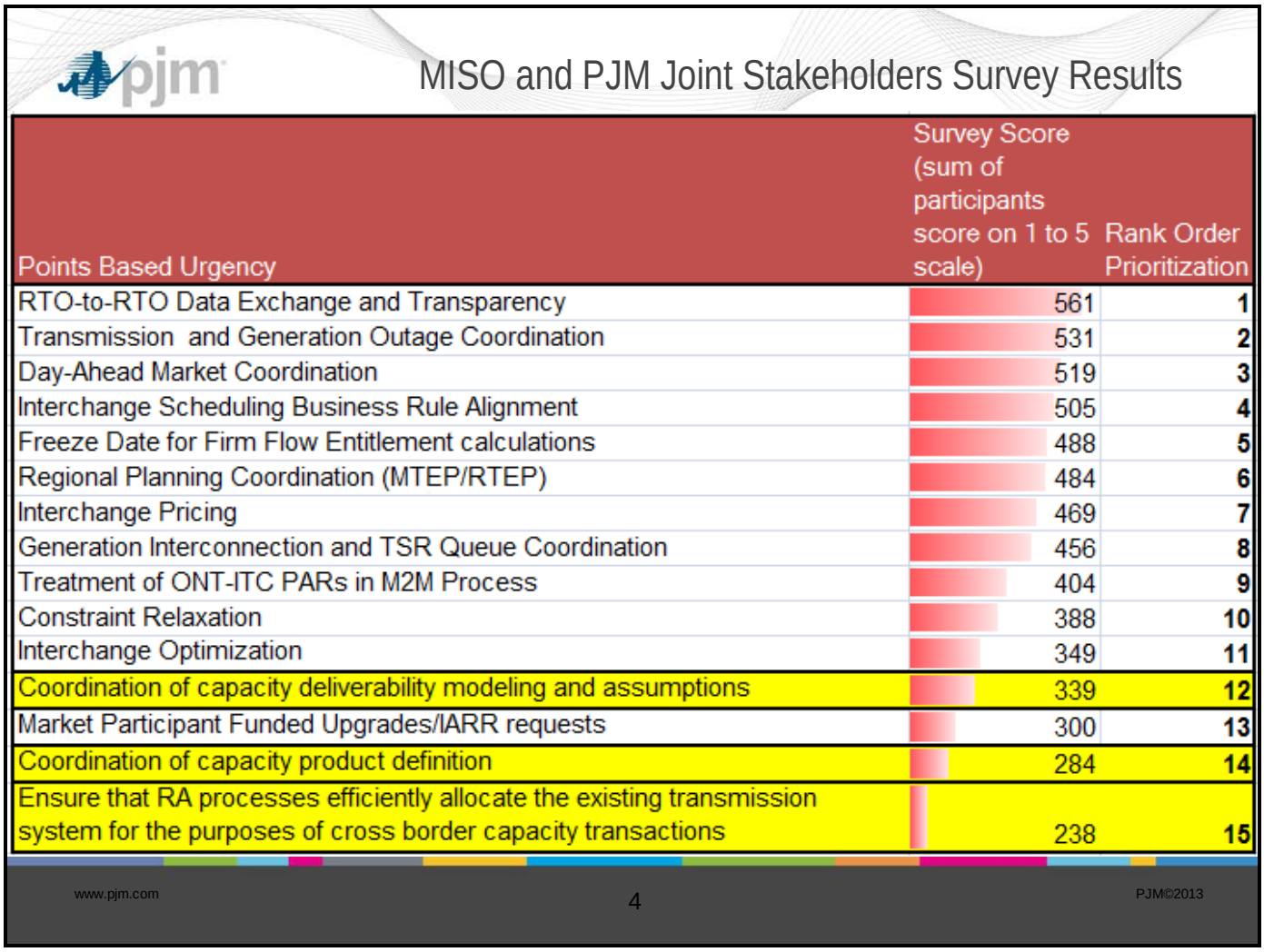
JCM Joint Stakeholder Process

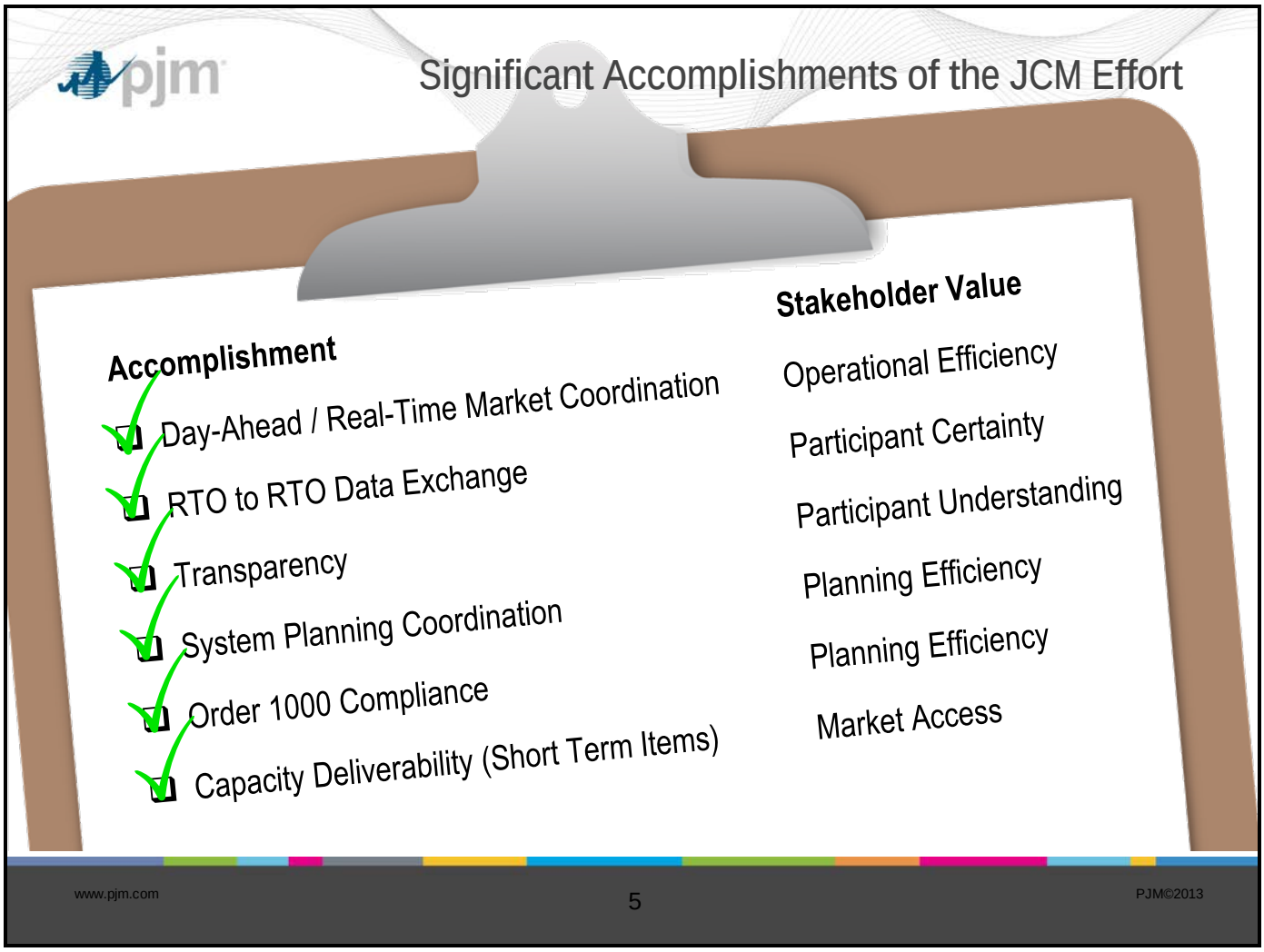
- PJM is committed to efficient and reliable interregional market coordination
- The revitalized JCM process is working well
  - PJM is committed
  - Both PJM and MISO Stakeholders are engaged
  - State Commissioners are engaged
- Stakeholders have established priorities
- Substantial progress has been made

Slide 4



MISO and PJM Joint Stakeholders Survey Results

Points Based Urgency	Survey Score (sum of participants score on 1 to 5 scale)	Rank Order Prioritization
RTO-to-RTO Data Exchange and Transparency	561	1
Transmission and Generation Outage Coordination	531	2
Day-Ahead Market Coordination	519	3
Interchange Scheduling Business Rule Alignment	505	4
Freeze Date for Firm Flow Entitlement calculations	488	5
Regional Planning Coordination (MTEP/RTEP)	484	6
Interchange Pricing	469	7
Generation Interconnection and TSR Queue Coordination	456	8
Treatment of ONT-ITC PARs in M2M Process	404	9
Constraint Relaxation	388	10
Interchange Optimization	349	11
Coordination of capacity deliverability modeling and assumptions	339	12
Market Participant Funded Upgrades/IARR requests	300	13
Coordination of capacity product definition	284	14
Ensure that RA processes efficiently allocate the existing transmission system for the purposes of cross border capacity transactions	238	15


Significant Accomplishments of the JCM Effort
Accomplishment
Day-Ahead / Real-Time Market Coordination
RTO to RTO Data Exchange
Transparency
System Planning Coordination
Order 1000 Compliance
Capacity Deliverability (Short Term Items)
Stakeholder Value
Operational Efficiency
Participant Certainty
Participant Understanding
Planning Efficiency
Planning Efficiency
Market Access
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A Path Forward – Next Steps

- The JCM process identified key priorities to address the seams issues that will have highest value impact from stakeholder perspective.
- PJM is committed to addressing the identified High Priority Items
  - Day-ahead / Real Time Market operations
  - Data Exchange / Transparency Improvements
  - Transmission Outage Scheduling Coordination
  - Transmission Planning Coordination
- Although capacity deliverability received low priority ranking, PJM expects continuing discussion with MISO and stakeholders

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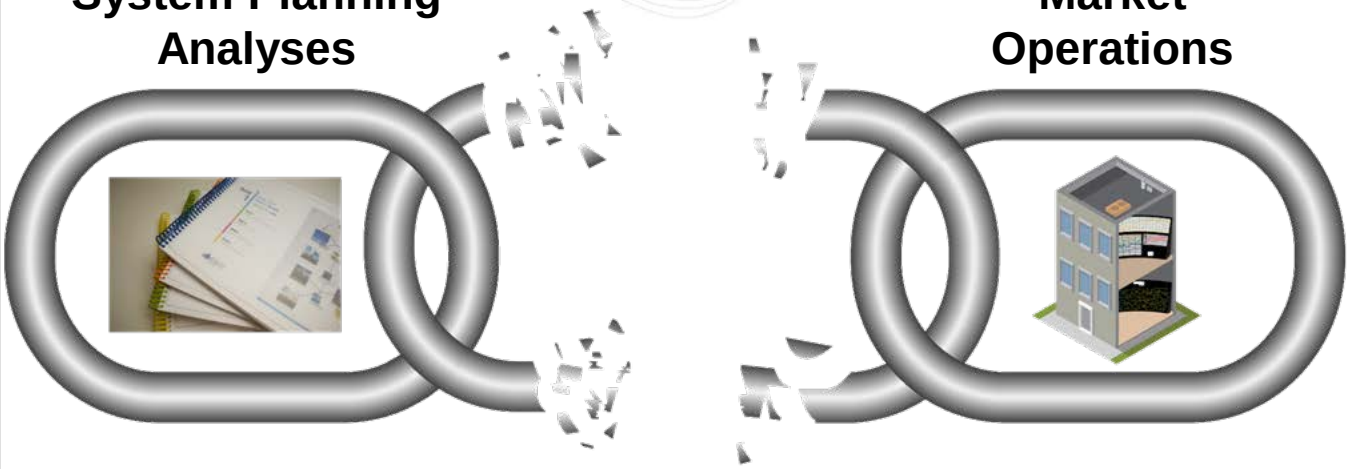
MISO's Proposal Appears to Ignore the Reliability Link

System Planning Analyses

Market Operations



Reliability requires the capacity construct and system planning to be consistent with actual grid operations.

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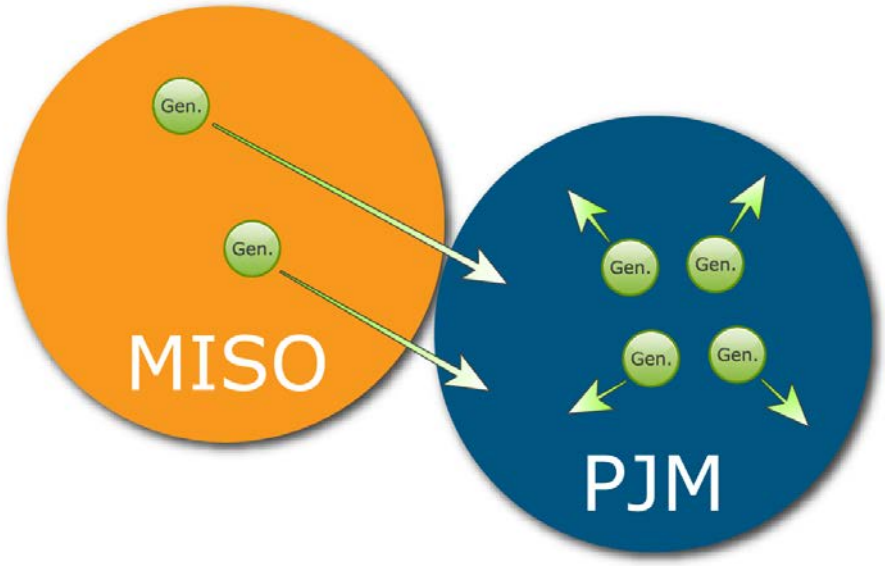
Assessing Deliverability of Capacity Resources



PJM evaluates deliverability from internal and external generators identically.

MISO's Proposal Appears to Ignore Operational Constraints

- Jeopardizes Reliability
- Shifts Costs to PJM Customers

Evaluating deliverability to PJM from a pooled group of generators ignores constraints that exist when generators perform differently in real time than assumed in the planning studies.

Presentation by: Chairman Phil Montgomery and Commissioner Greg White (OMS-OPSI Jointly

Slide 1

Organization of PJM States Inc. (OPSI) and Organization of MISO States (OMS)

Presentation to FERC: Docket No. AD12-16 Capacity Deliverability

Commissioner Greg White
Michigan Public Service Commission

Chairman Phil Montgomery
Public Service Commission of Wisconsin

June 20, 2013

Organization of MISO States

Presentation Outline

- Joint and Common Market (JCM)
- Capacity Deliverability (AD12-16)
- Issues in Proceeding
- OMS and OPSI Recommendation
- Potential Barriers
- Evaluation of Issues

Joint and Common Market (JCM)

- **Two of the nation's leading Regional Transmission Organizations (RTO), PJM and MISO, share a seam with complex issues that have been managed on a case-by-case basis; often resulting in markets and policy outcomes that some stakeholders find disappointing.**
- **Within the last 18 months and at the urging of stakeholders, PJM and MISO renewed combined efforts to address challenges along the seams, through the Joint and Common Market (JCM) initiative.**
- **State regulators, as well as all PJM and MISO stakeholders, participate in the JCM's comprehensive and collaborative process.**

Capacity Deliverability (AD12-16)

- **Capacity deliverability has become a flashpoint JCM issue since MISO first identified their concerns for the need to ensure efficient delivery of capacity between the two RTOs.**
- **MISO circulated a White Paper in support of capacity deliverability; many JCM Participants and PJM did not agree with the paper's conclusion.**
- **The disagreement evolved and eventually became this FERC Docket, No. AD12-16-000; which was opened prior to the reinstatement of the JCM.**

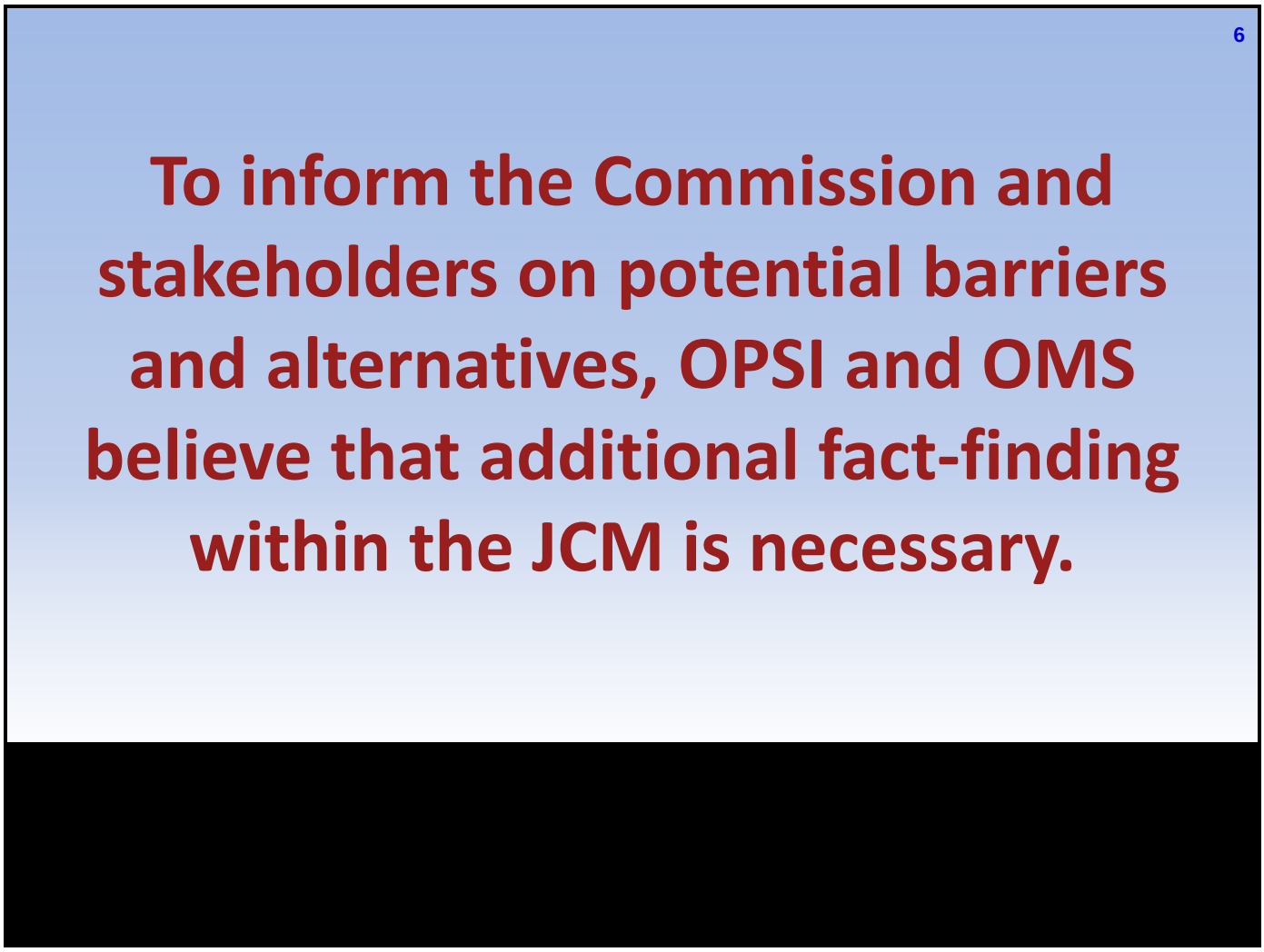
Issues in Proceeding

1. **Identifying the progress of efforts to address whether existing market rules and operating protocols concerning the transfer of capacity between MISO and PJM act as barriers to the delivery of capacity between those markets.**

2. **Identifying any unaddressed barriers to the transfer of capacity between those markets.**

3. **Identifying the measures that the Commission may take to address those barriers that may result in unjust and unreasonable rates.**

Slide 6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To inform the Commission and stakeholders on potential barriers and alternatives, OPSI and OMS believe that additional fact-finding within the JCM is necessary.

Cooperation, Transparency, and Collaboration

Independent Consultant - If it is determined in the JCM process that the RTOs cannot work together to complete the necessary study, OPSI and OMS suggest bringing an independent consultant into the JCM process, to gather the necessary information, with input from the RTOs and stakeholders.

Joint Fact-Finding

Steps in such a fact-finding include:

1. **Identifying an agreed upon methodology for determining transfer capability between MISO and PJM, in both directions.**
2. **Identifying a methodology for determining the magnitude of capacity that can reliably bid into PJM's Capacity Market from MISO and vice versa.**
3. **Identifying and studying the reliability impacts and the feasibility of potential revisions to existing market rules and operating protocols concerning the transfer of capacity between MISO and PJM.**
4. **Identifying a methodology for determining a cost/benefit analysis of implementing any necessary solutions.**

Potential Barriers

OPSI and OMS agree that potential barriers to participation in the MISO and PJM Capacity Markets may exist…

But the paramount question in the proceeding should be the appropriateness or reasonableness of those potential barriers.

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Questions for Consideration

- Are any of the asserted barriers to participation in the Capacity Markets unjust or unreasonable?
- May some of these barriers be characteristics of each RTO's capacity market necessary to maintain the reliability and economics of each or both capacity markets?

Questions for Consideration

- **Would the use of remaining transmission capability between MISO and PJM for long term capacity transfers be discriminatory to other parties' ability to otherwise utilize the remaining transmission capability?**

- **Is there potential discrimination against internal RTO generation or external generators to MISO and PJM that would also desire a similar ability to provide capacity to MISO or PJM?**

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Fact-Finding to Support the Analysis

OPSI and OMS believe the initial fact-finding must be utilized to evaluate and analyze critical issues.

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Evaluation of Issues

1. Determine the possibility and significance of cost shifts between MISO and PJM.

2. Consider the impact of any proposed or revised deliverability scheme on reliability.

3. Consider whether further work on capacity deliverability is cost effective.

Evaluation of Issues (Continued)

4. **Conclude if there is an overall incremental joint deliverability benefit over that currently occurring.**

5. **Consider whether the revisions can be cost-effectively and realistically implemented.**

6. **Determine the long-term rate impact on each RTO's retail customers.**

A fact-finding that provides RTOs and all stakeholders with the requisite information and analysis to take well informed positions is necessary to advance vital coordination, while still allowing RTOs to maintain their unique characteristics.

Without the collaborative involvement from both RTOs the output of any fact finding and subsequent analysis would likely be unreliable.

Prior OPSI and OMS Joint Comments

- **OPSI and OMS filed Joint Comments in AD12-16 on February 5, 2013 and since February, the effectiveness of the JCM process has shown improvement.**
- **State regulators do not want to actively direct or moderate fact finding or technical efforts.**
- **State regulators will continue to be active JCM participants and provide feedback, suggestions and input for the assessment of the capacity deliverability issue, as is expected of all other participants in the JCM.**

OPSI and OMS expect the JCM process to continue to be productive. We also look forward to working with MISO, PJM, and stakeholders in a cooperative examination of capacity deliverability.

Presentation by: Dr. David Patton (MISO Market Monitor)

Slide 1

Capacity Deliverability Issues Between PJM and MISO

Presented to:

Federal Energy Regulatory Commission

David B. Patton, Ph.D.
MISO IMM

POTOMAC ECONOMICS

Introduction

- Capacity deliverability is essential because the boundaries of the RTOs should ideally have no effect on:
  - ✓ The use of the network to dispatch the system in the operating timeframe; or
  - ✓ Decisions regarding where to invest or retire units on the long-run.
- These objectives can only be satisfied if:
  - ✓ Inefficient barriers to trading capacity between areas are eliminated to allow the markets to develop capacity in the lowest-cost areas; *and*
  - ✓ The obligations assigned to external capacity suppliers are reasonable and do not distort the efficient dispatch of the system.
- We have substantial concerns in both of these areas, and have recommended the ISOs work to resolve the issues since 2008.

POTOMAC ECONOMICS

Barriers to Capacity Trading

- The use of transmission to support capacity transactions needed to satisfy the ISOs' planning needs is among the highest value uses of the network (as indicated by capacity price differences).
- We have identified a variety of barriers that prevent full, economic utilization of the transmission capability in the planning horizon:
  - ✓ Understated firm ATC into PJM;
  - ✓ Use of a Capacity Benefit Margin;
  - ✓ Unit-specific deliverability testing; and
  - ✓ Ability of participants to hold firm capability that precludes efficient capacity sales.

POTOMAC ECONOMICS

External Capacity Obligations

- Inefficient operating requirements on external capacity suppliers can raise additional economic barriers to capacity trading.
- Capacity markets should recognize how energy is transferred between the ISO areas in reality.
  - ✓ The ISOs' dispatch in each area is adjusted to effectuate energy transfers (output is not delivered from specific units);
  - ✓ Hence, the ISOs should have operating procedures to ensure external capacity will be delivered on a firm basis
    - → this is both more efficient and reliable than imposing resource-specific dispatch obligations.

POTOMAC ECONOMICS

Next Steps

- Capacity deliverability substantially effects the efficiency of the long-term decisions made to satisfy the ISOs' planning needs.
- We have been raising these issues for five years and virtually no progress has been made.
- Although they have been discussing these issues, the RTOs have not agreed on:
  - ✓ Whether a problem exists;
  - ✓ What potential solutions may be reasonable for addressing it if there is one;
  - ✓ What the priority should be to implement a solution.
- For this reason, I continue to believe these issues will only be resolved if the Commission issue a reasonable deadline for the ISOs to work with their stakeholders on a solution.

POTOMAC ECONOMICS

Presentation by: Dr. Joseph Bowring (PJM Market Monitor)

Slide 1

Capacity Deliverability

Docket No. AD12-16
June 20, 2013

Joseph Bowring
Market Monitor for PJM

Monitoring Analytics

Slide 2

RPM Imports Summary 2007/2008 BRA through 2016/2017 BRA

	UCAP (MW)					
	MISO		Non-MISO		Total Imports	
Base Residual Auction	Offered	Cleared	Offered	Cleared	Offered	Cleared
2007/2008	1,073.0	1,072.9	547.9	547.9	1,620.9	1,620.8
2008/2009	1,149.4	1,109.0	517.6	516.8	1,667.0	1,625.8
2009/2010	1,189.2	1,151.0	518.8	518.1	1,708.0	1,669.1
2010/2011	1,194.2	1,186.6	539.8	539.5	1,734.0	1,726.1
2011/2012	1,862.7	1,198.6	3,560.0	3,557.5	5,422.7	4,756.1
2012/2013	1,415.9	1,298.8	1,036.7	1,036.7	2,452.6	2,335.5
2013/2014	1,895.1	1,895.1	1,358.9	1,358.9	3,254.0	3,254.0
2014/2015	2,104.5	2,104.5	1,948.8	1,948.8	4,053.3	4,053.3
2015/2016	1,538.7	1,538.7	2,396.6	2,396.6	3,935.3	3,935.3
2016/2017	4,723.1	4,723.1	2,770.6	2,759.6	7,493.7	7,482.7

Impact of capacity imports: 2016/2017 RPM Base Residual Auction

		Actual Auction Results		Reduce Imports by 25 Percent	
LDA	Product Type	Clearing Prices ($ per MW-day)	Cleared UCAP (MW)	Clearing Prices ($ per MW-day)	Cleared UCAP (MW)
RTO	Limited	$59.37	9,849.5	$77.51	10,399.5
	Extended Summer	$59.37	2,470.0	$77.82	2,712.4
	Annual	$59.37	156,840.2	$77.82	155,799.8
MAAC	Limited	$119.13	4,264.3	$119.12	4,238.1
	Extended Summer	$119.13	1,053.4	$119.43	1,078.4
	Annual	$119.13	61,228.7	$119.43	61,229.6
PSEG	Limited	$219.00	550.4	$218.69	550.4
	Extended Summer	$219.00	61.8	$219.00	61.8
	Annual	$219.00	5,686.4	$219.00	5,686.9
ATSI	Limited	$94.45	1,004.1	$95.71	1,001.6
	Extended Summer	$114.23	799.3	$114.23	799.1
	Annual	$114.23	6,868.8	$114.23	6,869.0

Impact of capacity imports: 2016/2017 RPM Base Residual Auction

		Actual Auction Results		Reduce Imports by 75 Percent	
LDA	Product Type	Clearing Prices ($ per MW-day)	Cleared UCAP (MW)	Clearing Prices ($ per MW-day)	Cleared UCAP (MW)
RTO	Limited	$59.37	9,849.5	$117.18	9,537.9
	Extended Summer	$59.37	2,470.0	$124.00	4,063.0
	Annual	$59.37	156,840.2	$124.00	154,449.2
MAAC	Limited	$119.13	4,264.3	$117.18	3,441.8
	Extended Summer	$119.13	1,053.4	$124.00	1,854.1
	Annual	$119.13	61,228.7	$124.00	61,417.4
PSEG	Limited	$219.00	550.4	$212.18	443.6
	Extended Summer	$219.00	61.8	$219.00	168.6
	Annual	$219.00	5,686.4	$219.00	5,697.9
ATSI	Limited	$94.45	1,004.1	$117.18	1,207.2
	Extended Summer	$114.23	799.3	$124.00	623.1
	Annual	$114.23	6,868.8	$124.00	8,366.9

Impact of capacity imports: 2016/2017 RPM Base Residual Auction

		Actual Auction Results		Exclude Imports without Firm Transmission	
LDA	Product Type	Clearing Prices ($ per MW-day)	Cleared UCAP (MW)	Clearing Prices ($ per MW-day)	Cleared UCAP (MW)
RTO	Limited	$59.37	9,849.5	$89.68	10,134.5
	Extended Summer	$59.37	2,470.0	$90.23	3,034.5
	Annual	$59.37	156,840.2	$90.23	155,477.7
MAAC	Limited	$119.13	4,264.3	$119.01	4,134.1
	Extended Summer	$119.13	1,053.4	$119.56	1,162.1
	Annual	$119.13	61,228.7	$119.56	61,250.8
PSEG	Limited	$219.00	550.4	$218.45	529.6
	Extended Summer	$219.00	61.8	$219.00	82.6
	Annual	$219.00	5,686.4	$219.00	5,687.3
ATSI	Limited	$94.45	1,004.1	$95.56	1,001.9
	Extended Summer	$114.23	799.3	$114.23	799.1
	Annual	$114.23	6,868.8	$114.23	6,869.0

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