OMA Energy Group

Agenda
OMA Energy Group Meeting
September 5, 2012

Welcome and Introductions		**Barry McClelland** **Chairman, OMA Energy Group** **Honda of America Manufacturing** **Eric L. Burkland** **President** **The Ohio Manufacturers' Association**
10:00 a.m.	**Mr. Andrew Ott**	**Senior Vice President - Markets, PJM**
	Mr. Steve Herling	**Vice President of Planning, PJM**
	Mr. Kerry Stroup	**Manager of Legislative and Regulatory Affairs, PJM**
11:30 a.m.	**Chairman Todd Snitchler**	**Public Utilities Commission of Ohio**
12:30 p.m.	**Lunch**	
1:00 p.m.	**Discussion**	
2:00 p.m.	**Adjourn**	

Chairman Todd A. Snitchler
Term expires, April 10, 2014

Chairman Todd A. Snitchler was appointed to the Public Utilities Commission of Ohio by Governor John Kasich in March 2011.

As chairman of the PUCO, Snitchler is the head of a 350-person agency that works to oversee the regulation of electric, natural gas, telecommunications, water, and commercial transportation in the state of Ohio. He is also the chairman of the Ohio Power Siting Board that reviews, evaluates, and approves the siting of electric generation plants and electric and natural gas transmission lines. Snitchler is a member of the National Association of Regulatory Utility Commissioners and serves as co-vice chair of the association's committees on gas, as well as serving on the committee on International Relations.

Before joining the Commission, Snitchler was elected to two terms in the Ohio House of Representatives, where he represented the 50th House District including parts of Stark County. In addition to serving in the Ohio Legislature, Snitchler was also an attorney in private practice. Snitchler is also a member of the Grove City College Alumni Council.

Chairman Snitchler received his bachelor's degree in history and secondary education/social science from Grove City College and his law degree from the University of Akron School of Law, where he served as executive editor of the *Akron Law Review*. He is a graduate of Leadership Stark County's 20th Class and an active member of The Chapel in North Canton.

Snitchler lives in Uniontown with his wife Melanie, with whom he has two children.

Andrew L. Ott

Sr. Vice President – Markets

Andrew L. Ott is senior vice president of Markets for PJM Interconnection. He also serves as a board member for PJM Technologies and PJM Environmental Information Services. Mr. Ott has been with PJM for more than 15 years and is responsible for executive oversight of PJM's Market Operations, Market Strategy, Member Training, State Relations, Customer Relations and Performance Compliance divisions. He was responsible for design and implementation of PJM's wholesale electricity markets including the PJM Locational Marginal Pricing, Financial Transmission Rights, Day-Ahead Energy Market and Capacity Market systems.

Mr. Ott has extensive experience in energy market restructuring, including electricity market design and implementation issues, and in power-system engineering applications. Mr. Ott serves on the board of directors on the Wholesale Electricity Quadrant of the North American Energy Standards Board. He serves as the US representative and working group chair for the CIGRE (International Council on Large Electric Systems) C5 Study Committee on Electricity Markets and Regulation.

Prior to joining PJM, Mr. Ott was employed by GPU for 13 years in transmission planning and operations.

Mr. Ott received a Bachelor of Science in Electrical Engineering from Pennsylvania State University. He also received a Master of Science in Applied Statistics from Villanova University.

PJM Interconnection, founded in 1927, ensures the reliability of the high-voltage electric power system serving 58 million people in all or parts of Delaware, Illinois, Indiana, Kentucky, Maryland, Michigan, New Jersey, North Carolina, Ohio, Pennsylvania, Tennessee, Virginia, West Virginia and the District of Columbia. PJM coordinates and directs the operation of the region's transmission grid, which includes 61,000 miles of transmission lines; administers a competitive wholesale electricity market; and plans regional transmission expansion improvements to maintain grid reliability and relieve congestion. Visit PJM at www.pjm.com.

An Introduction to PJM: Focus on its Markets, Planning, and Their Implications for Ohio *for* The Ohio Manufacturers' Association

PJM and Its Markets

Andrew Ott
Sr. Vice President, Markets
PJM Interconnection
September 5, 2012

S

What is a Regional Transmission Organization?

- An independent entity that is responsible for:
  - Operating competitive wholesale markets
  - Administering transmission tariff
  - Safe and reliable operation of regional power grid
  - Ensuring competitive open access to transmission where no member or member group has undo influence
- RTO owns no transmission or generation assets and has no financial interest in the wholesale market or in any of the market participants

PJM' Role

PJM operates the regional transmission grid to ensure reliability in a cost-effective manner and operates the world's largest competitive wholesale electricity market.

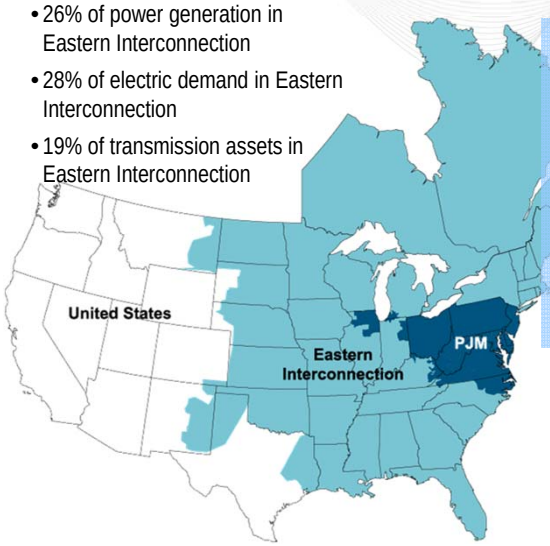
PJM's long-term Regional Transmission Planning Process ensures reliability and economic benefits on a system wide basis.

Vision: *To be the electric industry leader – today and tomorrow – in reliable operations, efficient wholesale markets, and infrastructure development.*

Elements of A Regional Transmission Organization

PJM Wholesale Electric Power Market

- 26% of power generation in Eastern Interconnection
- 28% of electric demand in Eastern Interconnection
- 19% of transmission assets in Eastern Interconnection

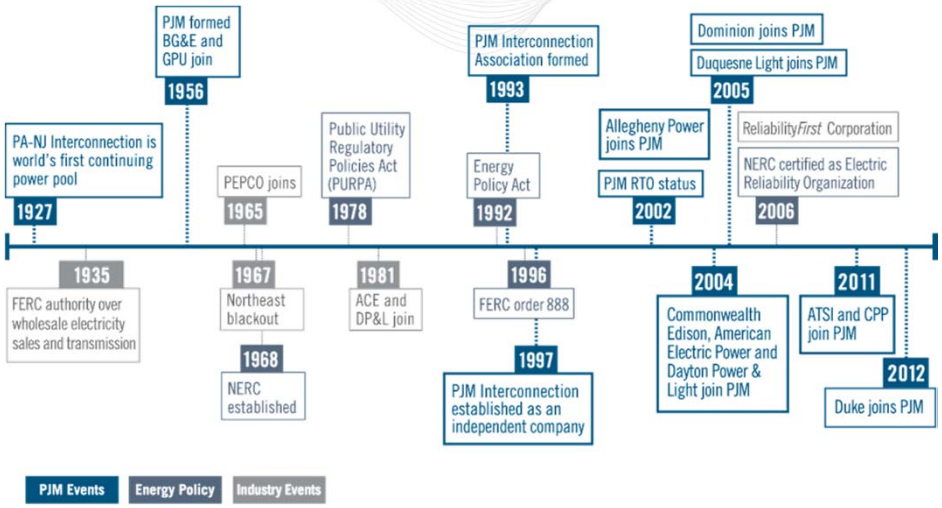


KEY STATISTICS	
PJM member companies	800
millions of people served	60
peak load in megawatts	163,848
MWs of generating capacity	185,600
miles of transmission lines	62,591
GWh of annual energy	832,331
generation sources	1,365
square miles of territory	214,000
area served	13 states + DC
Internal/external tie lines	142

21% of U.S. GDP produced in PJM

As of 6/2012

The History of PJM




PJM 10-Year Growth
MEMBERS: 200
BILLINGS: $4.7
CAPACITY: 72,400
02
MEMBERS: 250
BILLINGS: $6.9
CAPACITY: 76,000
03
MEMBERS: 342
BILLINGS: $8.7
CAPACITY: 143,420
04
MEMBERS: 390
BILLINGS: $22.6
CAPACITY: 164,634
05
MEMBERS: 450
BILLINGS: $20.1
CAPACITY: 164,905
06
MEMBERS: 500
BILLINGS: $30.5
CAPACITY: 163,498
07
MEMBERS: 550
BILLINGS: $34.3
CAPACITY: 164,895
08
MEMBERS: 565
BILLINGS: $26.6
CAPACITY: 167,326
09
MEMBERS: 670
BILLINGS: $34.8
CAPACITY: 167,362
10
MEMBERS: 750
BILLINGS: $35.9
CAPACITY: 185,600
11
PJM 10-YEAR GROWTH
BILLINGS = Billions
CAPACITY = Megawatts
www.pjm.com
7
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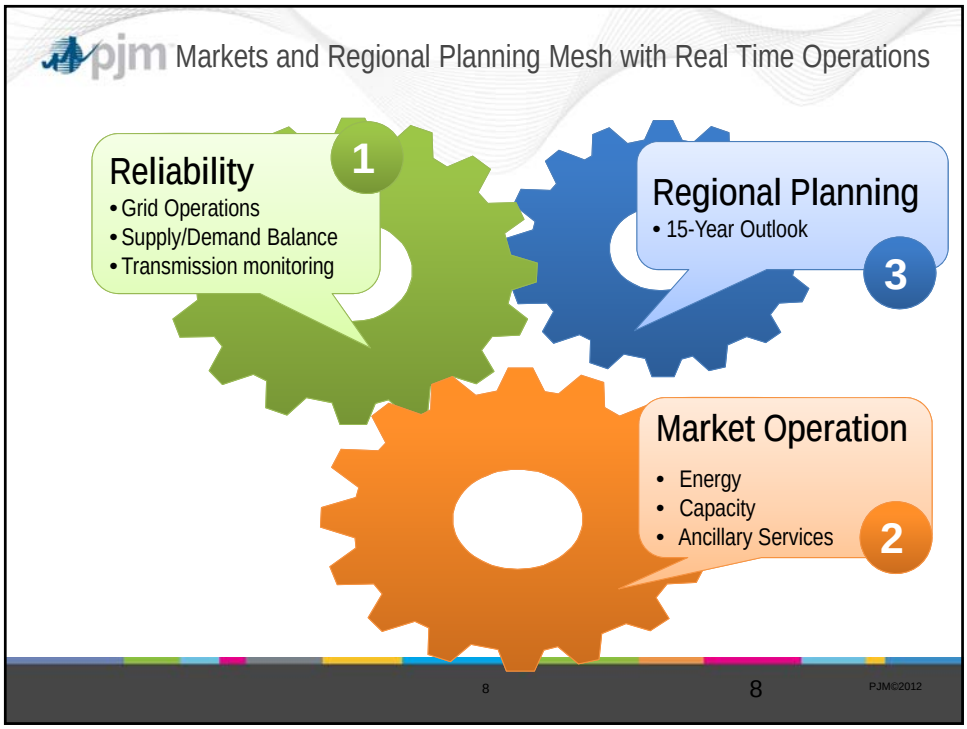
Markets and Regional Planning Mesh with Real Time Operations
Reliability
1
• Grid Operations
• Supply/Demand Balance
• Transmission monitoring
Regional Planning
• 15-Year Outlook
3
Market Operation
• Energy
• Capacity
• Ancillary Services
2
8
8
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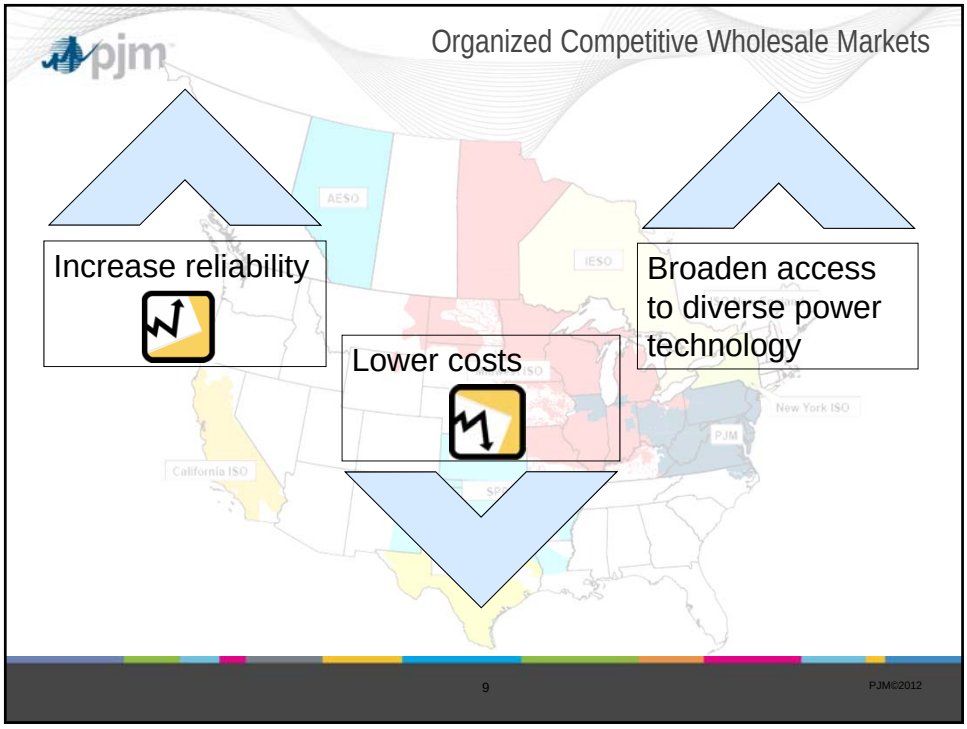
Organized Competitive Wholesale Markets
Increase reliability
Lower costs
Broaden access to diverse power technology
9
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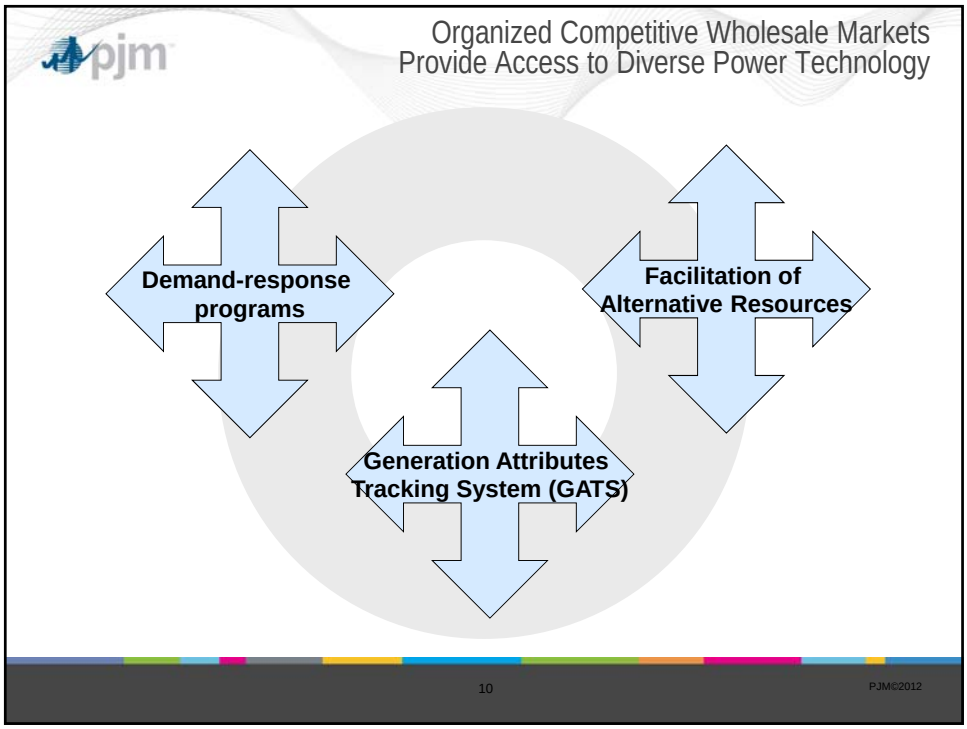

Organized Competitive Wholesale Markets
Provide Access to Diverse Power Technology
Demand-response programs
Facilitation of Alternative Resources
Generation Attributes Tracking System (GATS)
10
PJM©2012

Regional Market Benefits

Reliability – resolving constraints and economic efficiency– **from $470 million to $490 million in annual savings**

Generation investment – decreased need for infrastructure investment – from $640 million to $1.2 billion in annual savings

Energy production cost – efficiency of centralized dispatch over a large region – from $340 million to $445 million in annual savings

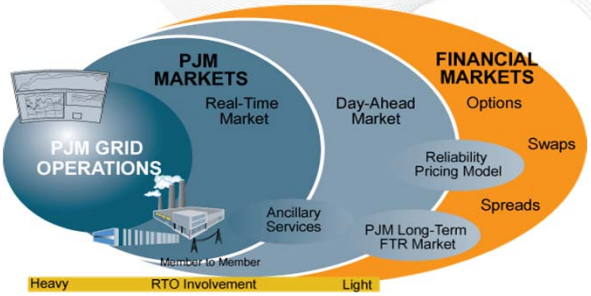
Grid services – cost-effective procurement of synchronized reserve, regulation – from $134 million to $194 million in annual savings

$2.2 billion in annual savings

Market Benefits

- Information and price transparency
- Seams elimination
  - Elimination of pancaking
- Reduced prices
- Operational efficiency
- Market liquidity
- Increased system reliability
- Regional transmission planning
  - Transmission investment
  - Generation investment
- Increased demand response
- Support innovation and renewable energy development

Market Evolution



- Day-Ahead Energy Market
- Real-Time Energy Market
- Capacity Market
- Financial Transmission Rights Auctions
- Gas/Electric Market Coordination

Ancillary Services Markets

- Regulation
- Synchronized Reserves
- Day-ahead Scheduling Reserves
- Black Start Services
- Reactive Services

Industry Evolution

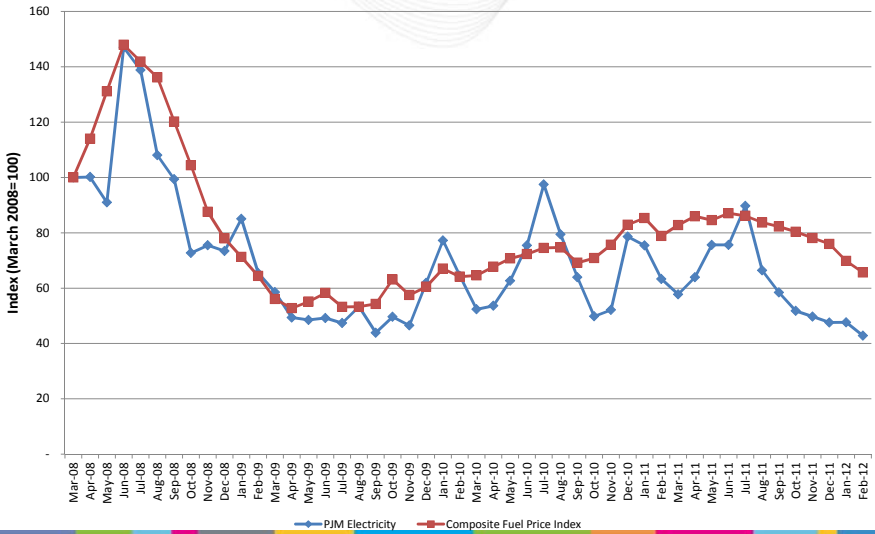
Evolution of Supply	Evolution of Demand	Market Evolution
• Traditional resources → *Less flexible*	• Technology enabled flexibility	• Improvement in optimization and control systems
• Renewable resources → *Intermittent*	• Alternative resource growth	• More real-time markets to reward consumer flexibility
• Less capability to provide power grid services	• Enhanced capability to provide grid services	•Development of Forward Demand Response Control Signals

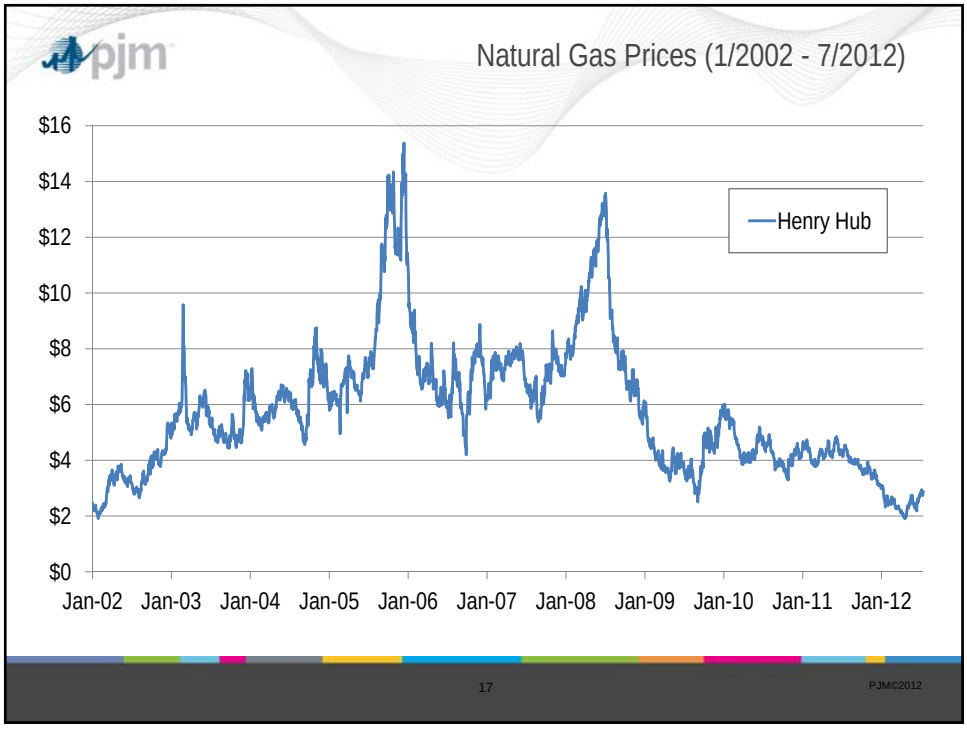
Evolution of Alternative Resources

- Storage
  - Stationary Battery
    - Ancillary Service supply
    - Integration with intermittent resources
  - Water Heaters
  - Compressed Air
  - Electric Vehicles
- Integrated renewable resource and building management systems
- Integrated distributed resources

PJM LMP vs. Composite Fuel Price Index

(70% Coal, 25% Natural Gas, 5% Petroleum; March 2008=100)




Natural Gas Prices (1/2002 - 7/2012)
$16
$14
$12
$10
$8
$6
$4
$2
$0
Henry Hub
Jan-02
Jan-03
Jan-04
Jan-05
Jan-06
Jan-07
Jan-08
Jan-09
Jan-10
Jan-11
Jan-12
17
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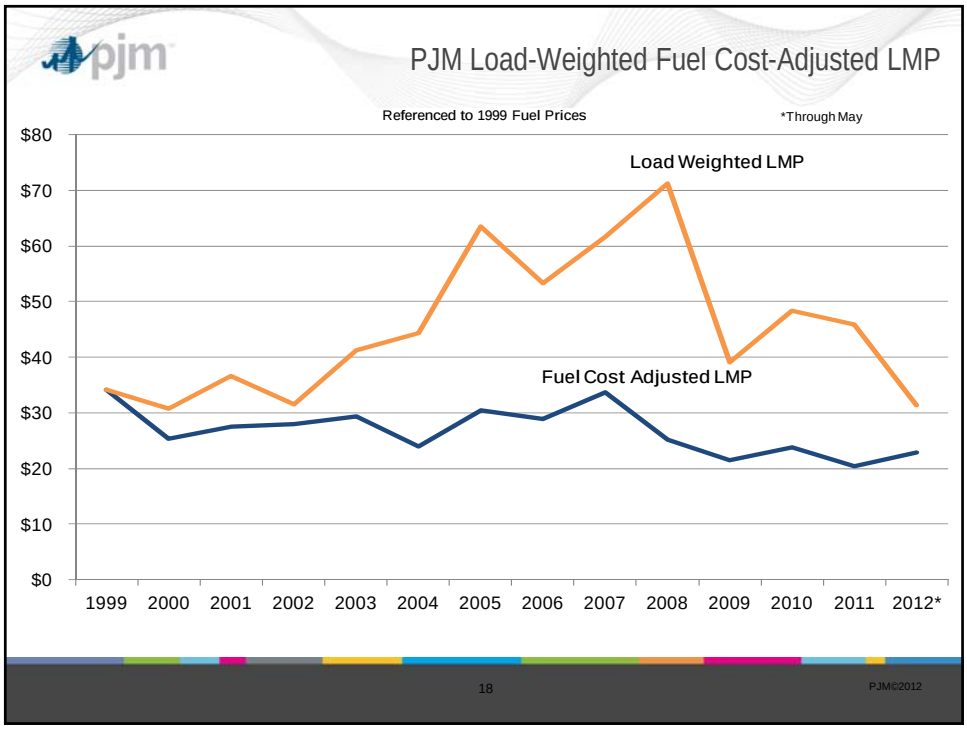
PJM Load-Weighted Fuel Cost-Adjusted LMP
Referenced to 1999 Fuel Prices
*Through May
$80
$70
$60
$50
$40
$30
$20
$10
$0
Load Weighted LMP
Fuel Cost Adjusted LMP
1999
2000
2001
2002
2003
2004
2005
2006
2007
2008
2009
2010
2011
2012*
18
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Capacity vs. Energy

Capacity

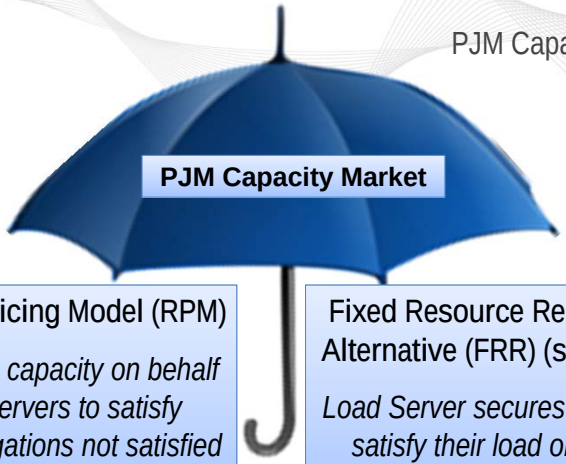
- A commitment of a resource to provide energy during PJM emergency.
- Capacity revenues paid to committed resource whether or not energy is produced by resource.
- Long-term commitment
- Daily product

Energy

- Generation of electric power over a period of time
- Energy revenues paid to resource based on participation in Day-Ahead or Real-Time energy market
- Daily / hourly commitment
- Hourly or real-time product
- $1000 / MWh offer cap

Capacity, energy & ancillary services revenues are expected, in the long term, to meet the fixed and variable costs of generation resources to ensure that adequate generation is maintained for reliability of the electric grid.

PJM Capacity Market



80%

Reliability Pricing Model (RPM)

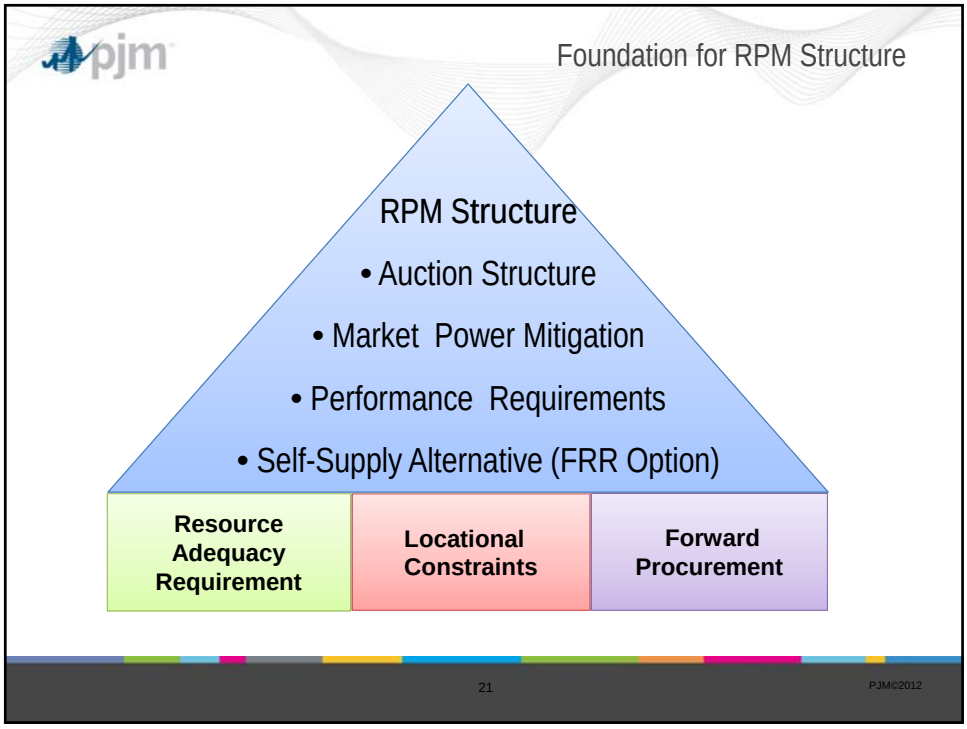
PJM secures capacity on behalf of Load Servers to satisfy capacity obligations not satisfied through self-supply.

20%

Fixed Resource Requirement Alternative (FRR) (self-supply)

Load Server secures capacity to satisfy their load obligation.

PJM Capacity Market is designed to ensure adequate availability of resources that can be called upon to ensure the reliability of the electric grid.


Foundation for RPM Structure
RPM Structure
• Auction Structure
• Market Power Mitigation
• Performance Requirements
• Self-Supply Alternative (FRR Option)
Resource Adequacy Requirement
Locational Constraints
Forward Procurement
21
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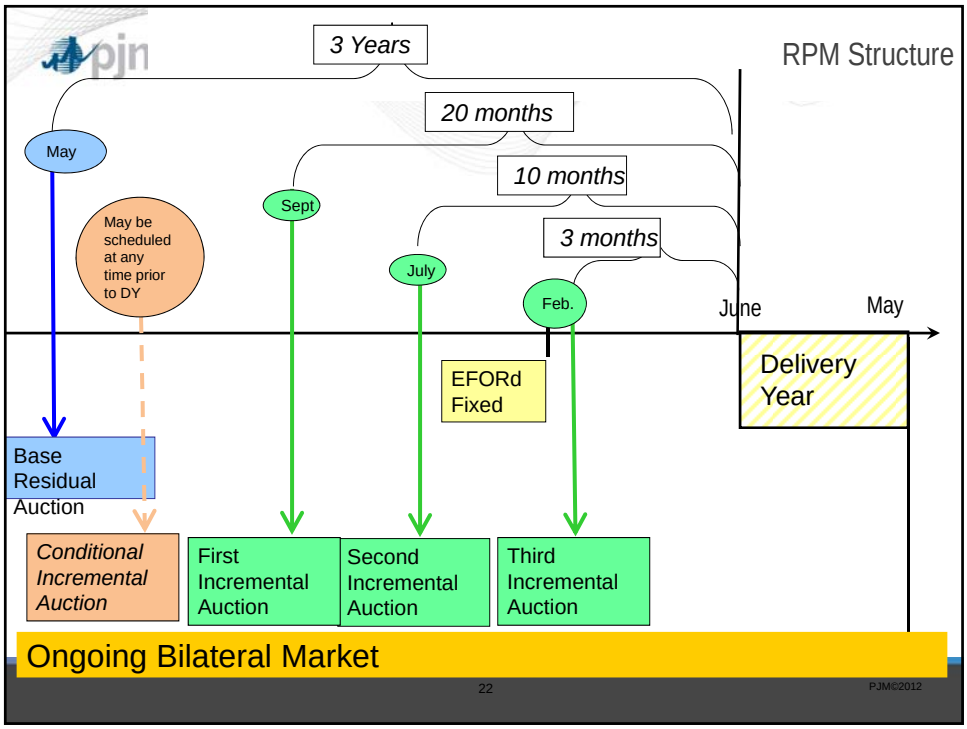
RPM Structure
3 Years
20 months
10 months
3 months
May
Sept
July
Feb.
May be scheduled at any time prior to DY
June
May
EFORd Fixed
Delivery Year
Base Residual Auction
Conditional Incremental Auction
First Incremental Auction
Second Incremental Auction
Third Incremental Auction
Ongoing Bilateral Market
22
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Locational Constraints

Resources in the unconstrained area can help meet the Reliability Requirement of the constrained area

Unconstrained Locational Delivery Area (LDA)
RCP = $16.46/MW-day

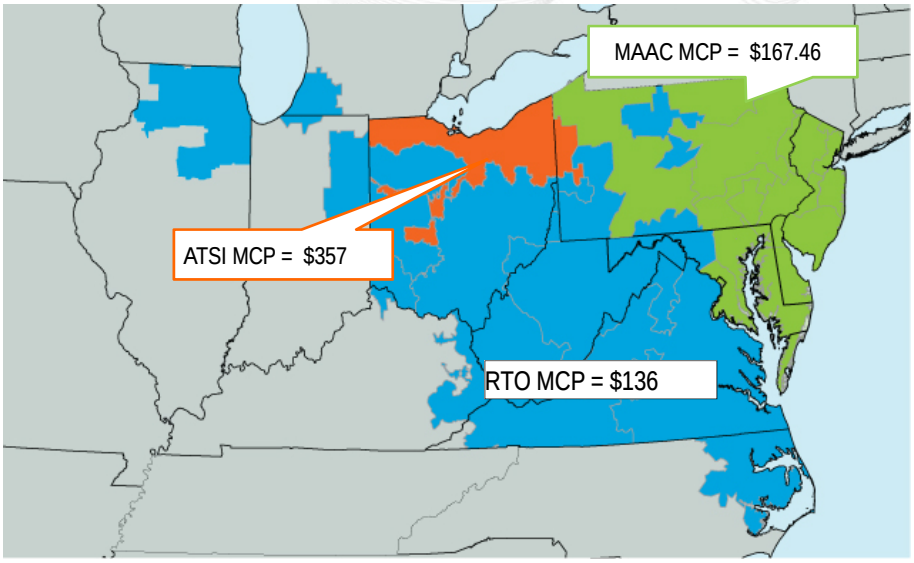
Import

Constrained Area
RCP = $198.42/ MW-day

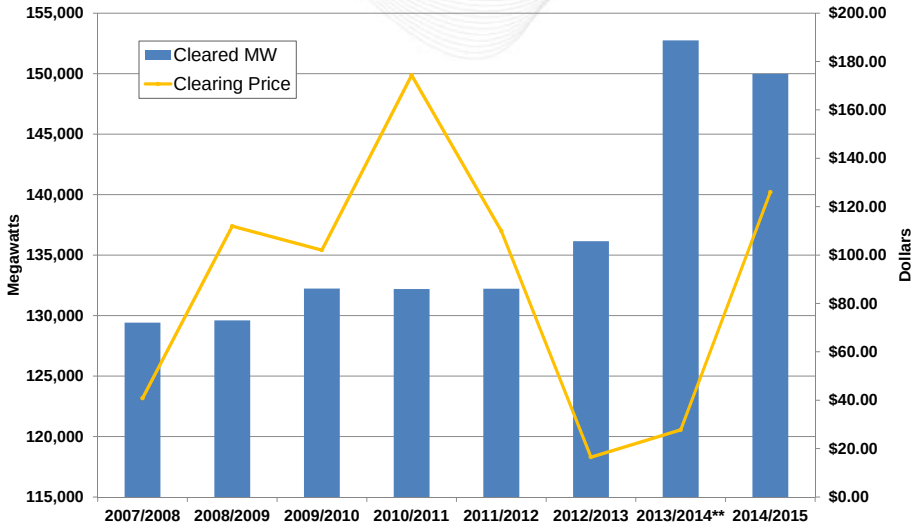
In the event the import limit is reached, more expensive capacity located within the constrained area needs to be committed to meet the local Reliability Requirement

The amount of resources in the unconstrained area that can help meet the constrained area is limited by the actual transfer limit as calculated by PJM Planning Engineers.

2015/2016 Base Residual Auction Clearing Prices ($/MW-Day)

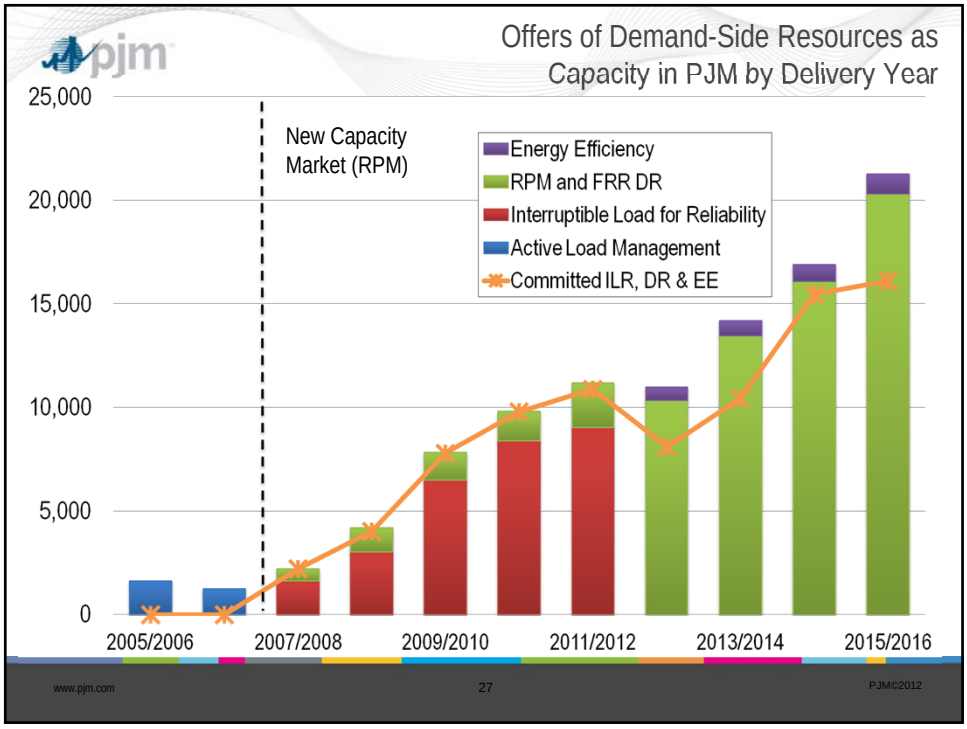


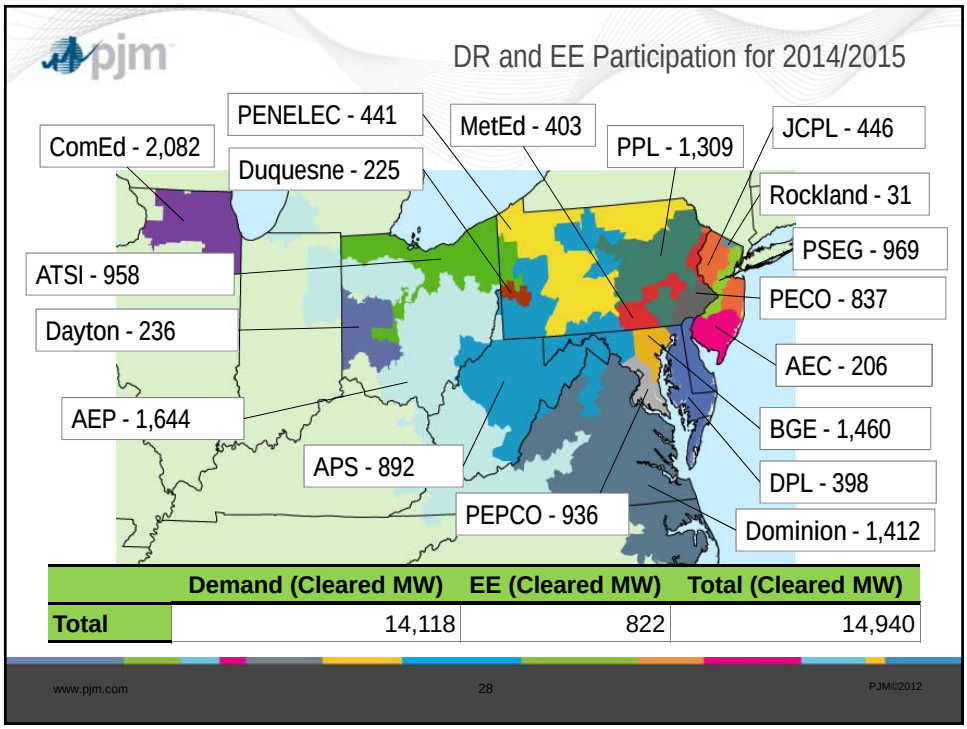
Reliability Pricing Model Auction Results for PJM



Capacity Resources

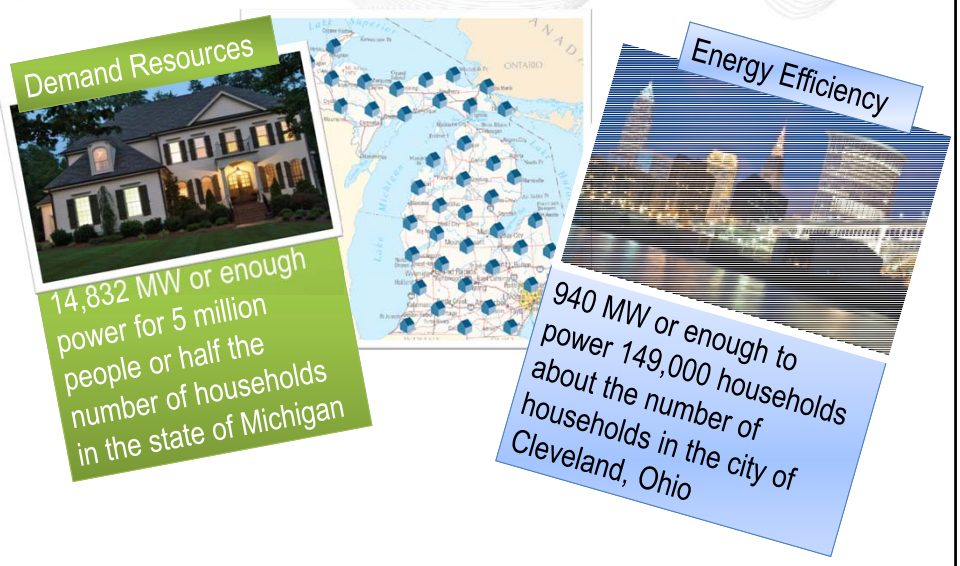
- Generation
- Transmission
- Demand Response (DR)
- Energy Efficiency



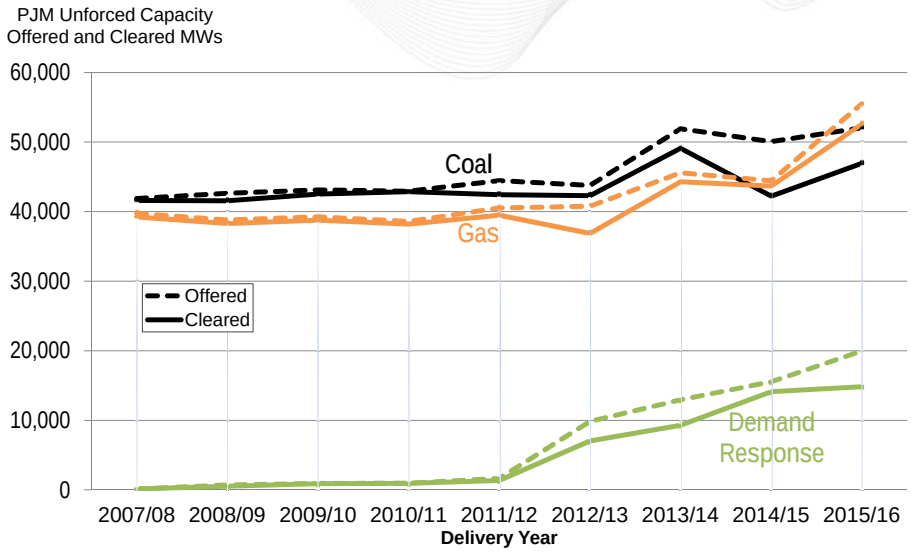


	Demand (Cleared MW)	EE (Cleared MW)	Total (Cleared MW)
Total	14,118	822	14,940

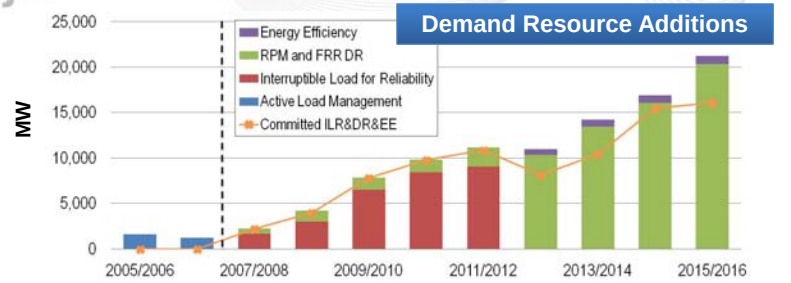
Demand Resources in the Capacity Market-2015/2016

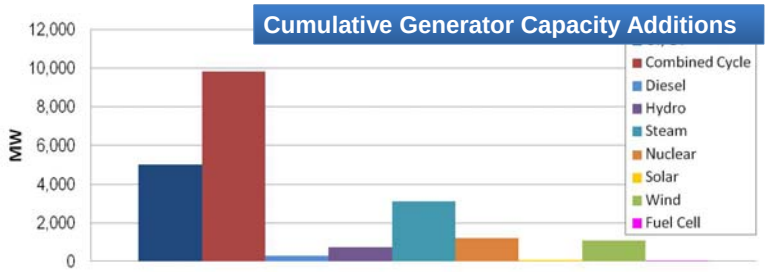


Changing Fuel Mix in PJM Market

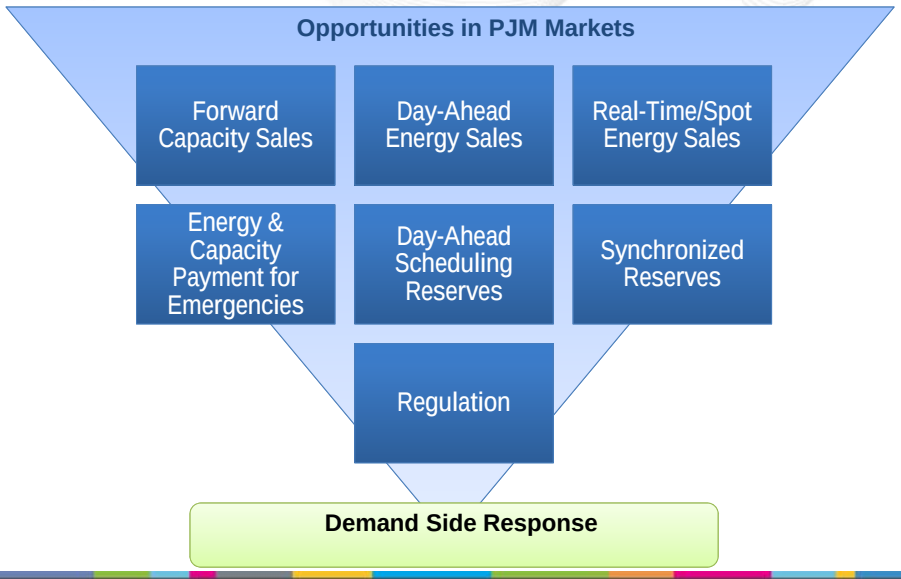


PJM Forward Capacity Market, 2007 - 2015





Current Opportunities for Demand Side Response



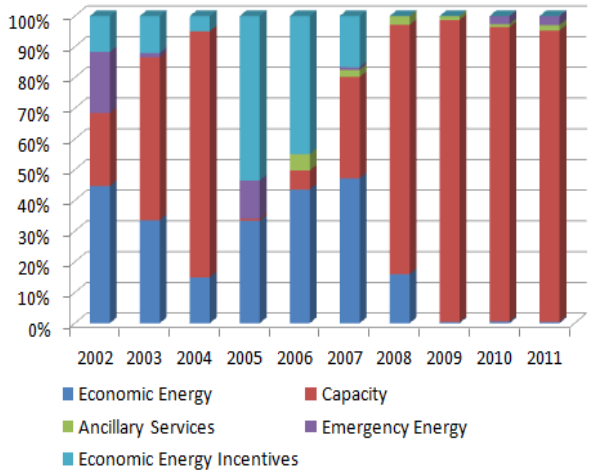
PJM Demand Response

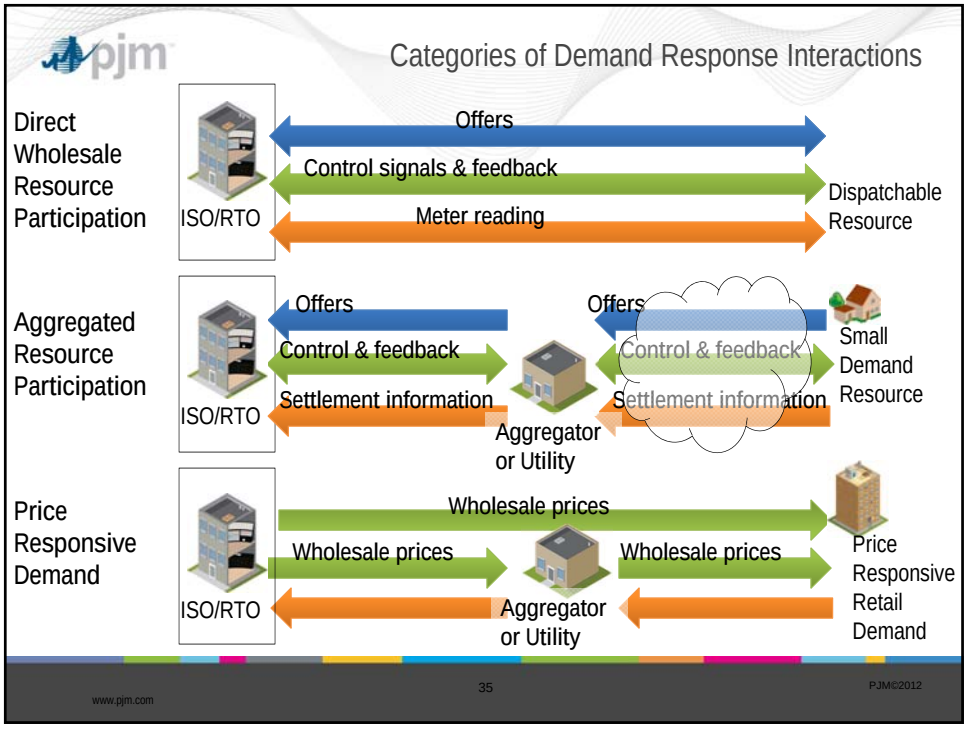
EMERGENCY	ECONOMIC
Designed to provide a method by which end-use customers may be compensated by PJM for reducing load during an emergency event.	Designed to provide an incentive to customers or curtailment service providers to reduce consumption when PJM LMP prices are high.

Load Response = Demand Side Response (DSR)

Demand Response Evolving Revenue Streams

- Nearly 25% of synchronous reserves are provide by DR
- DR revenues grew from around $1.4 million in 2002 to over $500 million annually




Categories of Demand Response Interactions
Direct Wholesale Resource Participation
ISO/RTO
Offers
Control signals & feedback
Meter reading
Dispatchable Resource
Aggregated Resource Participation
ISO/RTO
Offers
Control & feedback
Settlement information
Aggregator or Utility
Offers
Control & feedback
Settlement information
Small Demand Resource
Price Responsive Demand
ISO/RTO
Wholesale prices
Wholesale prices
Aggregator or Utility
Wholesale prices
Price Responsive Retail Demand
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35
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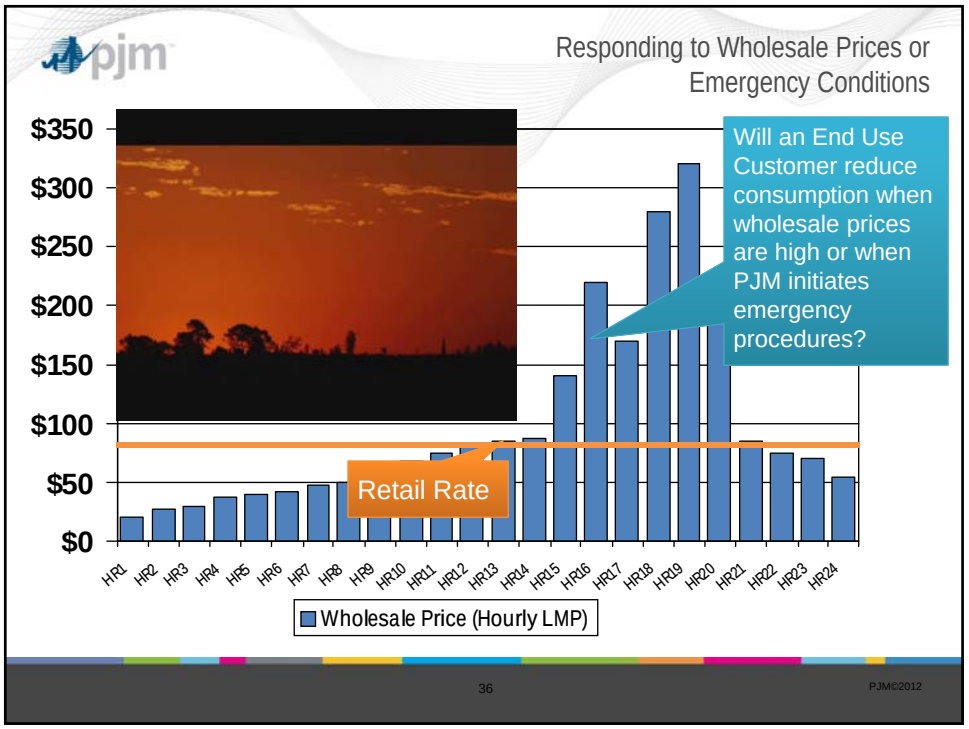
Responding to Wholesale Prices or Emergency Conditions
$350
$300
$250
$200
$150
$100
$50
$0
Will an End Use Customer reduce consumption when wholesale prices are high or when PJM initiates emergency procedures?
Retail Rate
HR1 HR2 HR3 HR4 HR5 HR6 HR7 HR8 HR9 HR10 HR11 HR12 HR13 HR14 HR15 HR16 HR17 HR18 HR19 HR20 HR21 HR22 HR23 HR24
Wholesale Price (Hourly LMP)
36
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Steven R. Herling

Steven R. Herling is Vice President of Planning at PJM Interconnection. He is responsible for the oversight of the System Planning Division which includes Transmission Planning, Interregional Planning, Interconnection Projects, Interconnection Analysis, and Resource Adequacy Planning.

Mr. Herling has been involved extensively in the development of PJM's regional transmission expansion planning process and resource adequacy planning process. Recently, he has been actively involved in the development of a number of new backbone transmission projects on the PJM system as well as efforts to enhance coordination of planning activities across ISO/RTO boundaries.

Prior to joining PJM, Mr. Herling worked for the General Public Utilities Service Corporation in systems operations and the American Electric Power Service Corporation in bulk transmission planning. Mr. Herling earned a bachelor of science degree in electric power engineering and a master of engineering degree in electric power engineering, both from Rensselaer Polytechnic Institute. He is a licensed professional engineer in the state of Ohio.

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An Introduction to PJM: Focus on Markets, Planning, and Their Implications for Ohio

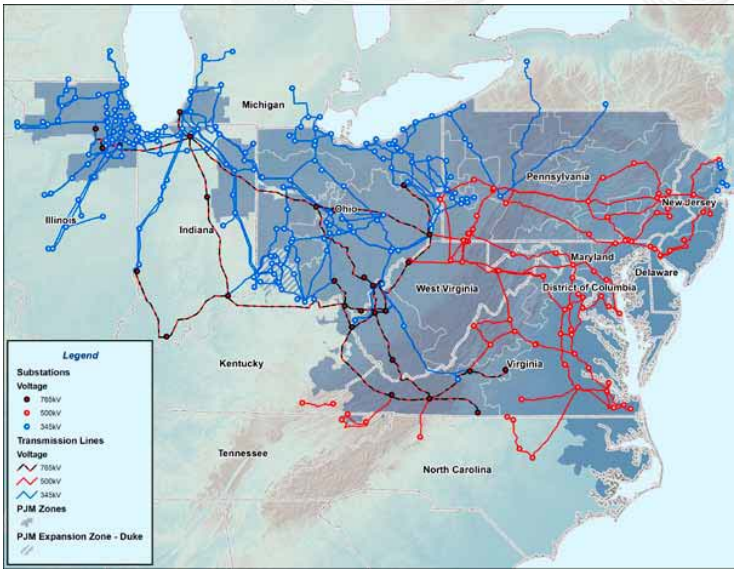
for

The Ohio Manufacturers' Association

PJM Regional Transmission Expansion Plan (RTEP) Overview

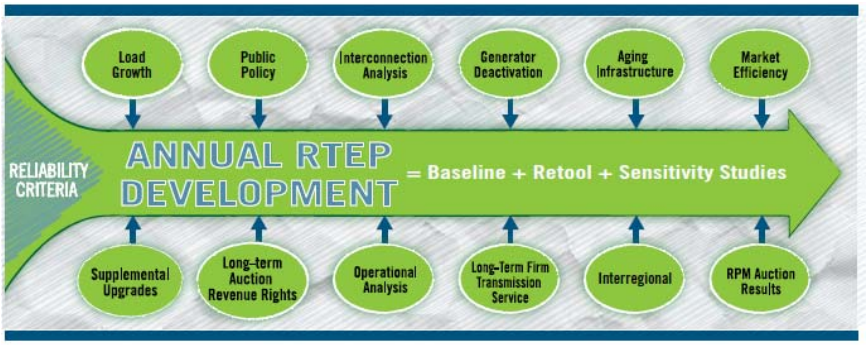
Steve Herling
Vice President, Planning
PJM Interconnection
September 5, 2012

Scope - PJM Backbone Transmission System



RTEP Process Characteristics

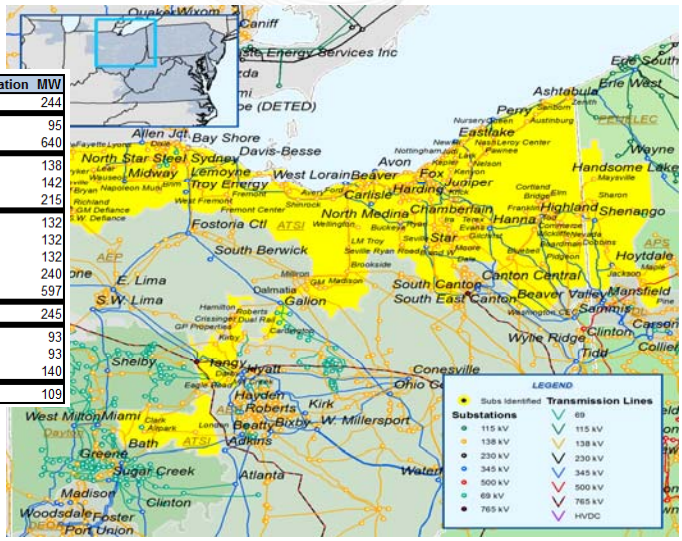
- Ongoing and cyclical
- 15 year planning horizon
- Comprehensive and Holistic
- Collaborative
- NERC, RFC, PJM compliance
- FERC-approved



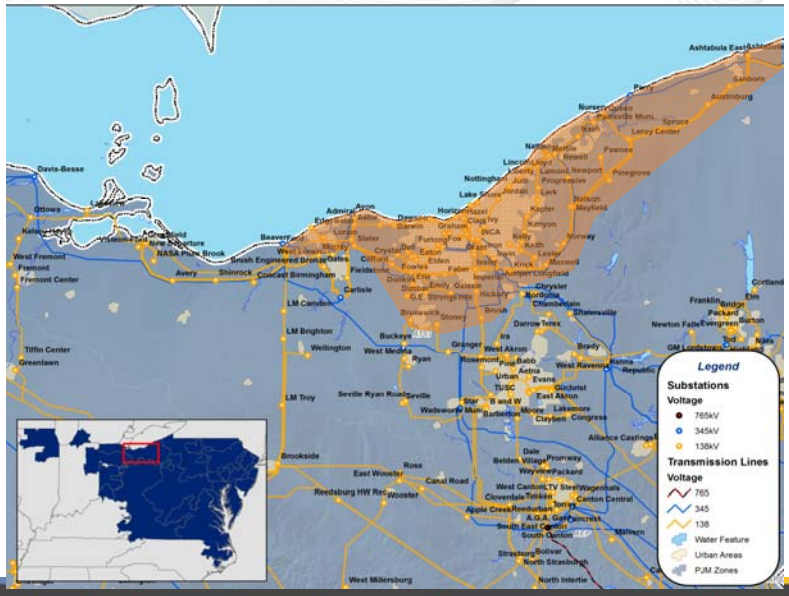
LDA Evaluation – Cleveland Area

Existing ASTI LDA

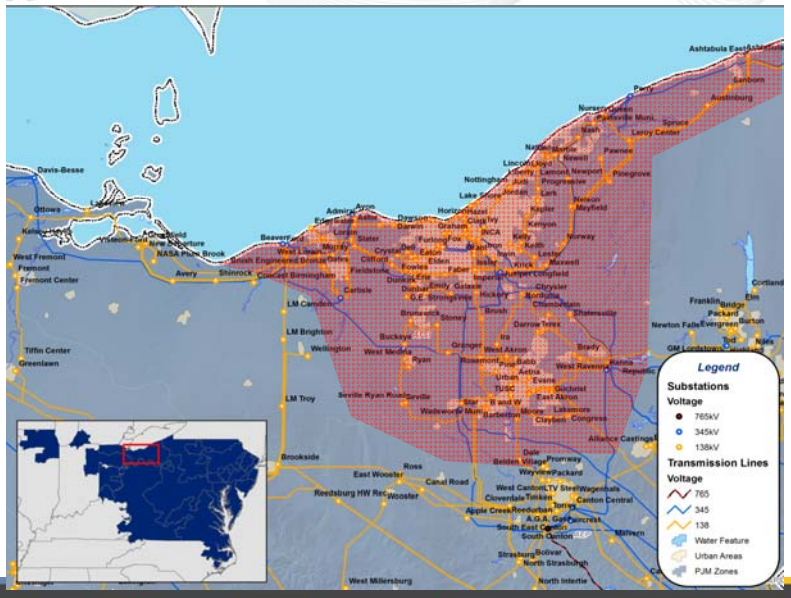
Deactivation Notification	MW
Ashtabula 5	244
Avon Lake 7	95
Avon Lake 9	640
Bay Shore 2	138
Bay Shore 3	142
Bay Shore 4	215
Eastlake 1	132
Eastlake 2	132
Eastlake 3	132
Eastlake 4	240
Eastlake 5	597
Lake Shore 18	245
New Castle 3	93
New Castle 4	93
New Castle 5	140
Niles 1	109



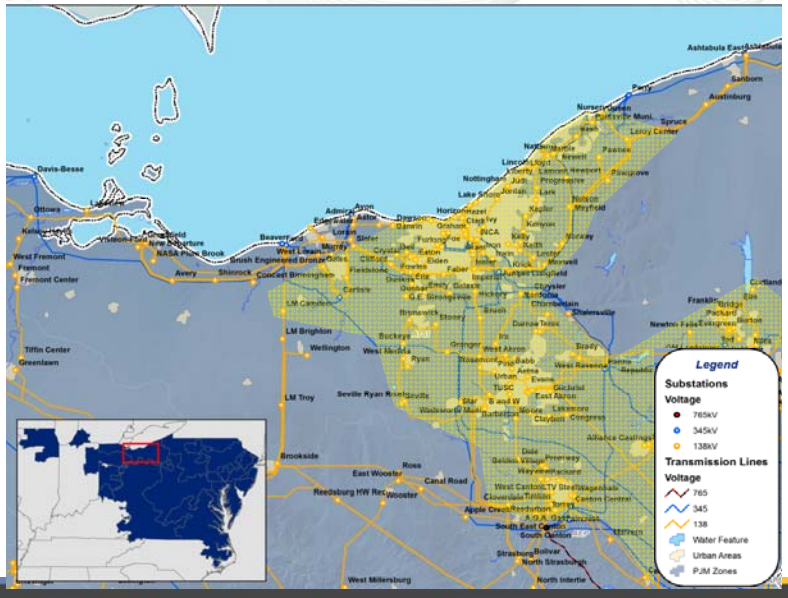
Approximate Cleveland Reactive Operational Interface



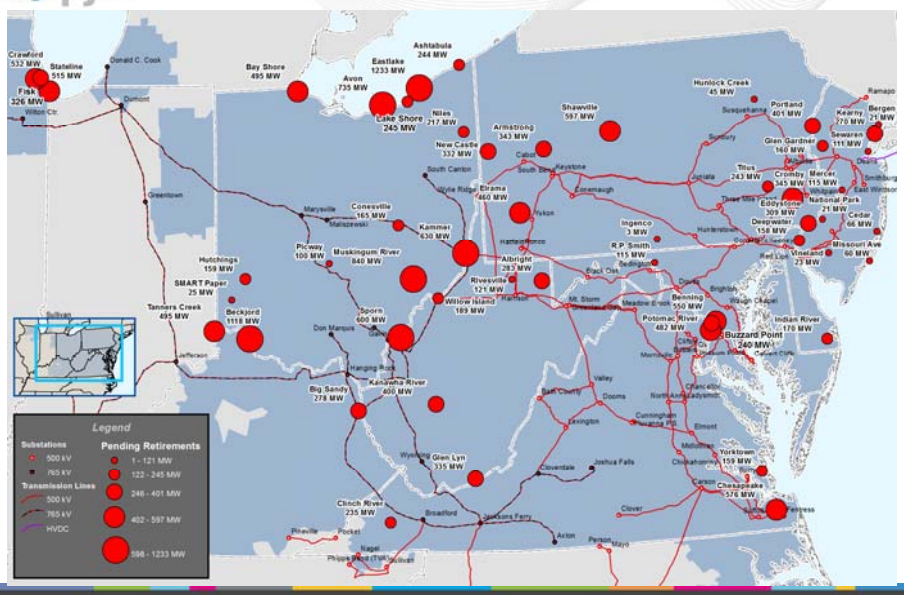
Greater Cleveland LDA



South Canton DFAX LDA



Generation Retirements



Generator Deactivation Process

Covered under Part V of the PJM tariff

- Generator provides PJM with a notice of their intent to deactivate
- Within 30 days of the deactivation notification PJM notifies the generation owner if deactivating the unit will adversely effect reliability
- Within 60 days the generation owners notifies PJM if they will operate beyond their intended deactivation date
- Within 75 days PJM provides an updated estimate of when the required transmission upgrades will be completed
- Within 90 days PJM posts a report on the web

Deactivation Status

Unit	Trans Zone	Requested Deactivation Date	PJM Reliability Status
Chesapeake 1 & 2, Yorktown 1	DOM	12/31/2014	Reliability Analysis complete. Impacts identified. Upgrades expected to be completed by June 2015.
Chesapeake 3 & 4	DOM	12/31/2015	Reliability Analysis complete. Impacts identified. Upgrades expected to be completed by June 2016.
Bergen 3; Burlington 8; National Park 1; Mercer 3; Sewaren 6	PSEG	6/1/2015	Reliability Analysis Complete. Impacts identified and expected to be resolved in three - four years. Working with affected TO to finalize upgrade schedule.
Armstrong 1 & 2; Bayshore 2-4; Eastlake 4-5; R Paul Smith 3 & 4	ATSI/AP	9/1/2012	Reliability analysis complete. Impacts identified and expected to be resolved by June 2016. Further refinement of the reliability analysis, required upgrades, and generator deactivation schedule continues. Unit will deactivate as scheduled. See posting - FE Generator Deactivation Study Results and Required Upgrades.
Ashtabula 5; Eastlake 1-3; Lake Shore 18	ATSI	9/1/2012	Reliability analysis complete. Impacts identified and expected to be resolved by June 2016. Further refinement of the reliability analysis, required upgrades, and generator deactivation schedule continues. Unit will continue to operate as upgrades to transmission system are constructed - estimated till June 1, 2015. See posting - FE Generator Deactivation Study Results and Required Upgrades
Walter C Beckjord 1	DEOK	5/1/2012	Reliability Analysis complete - no impacts identified.
Walter C Beckjord 2-6	DEOK	4/1/2015	Reliability Analysis complete - impacts identified - upgrades scheduled to be completed by June 2014

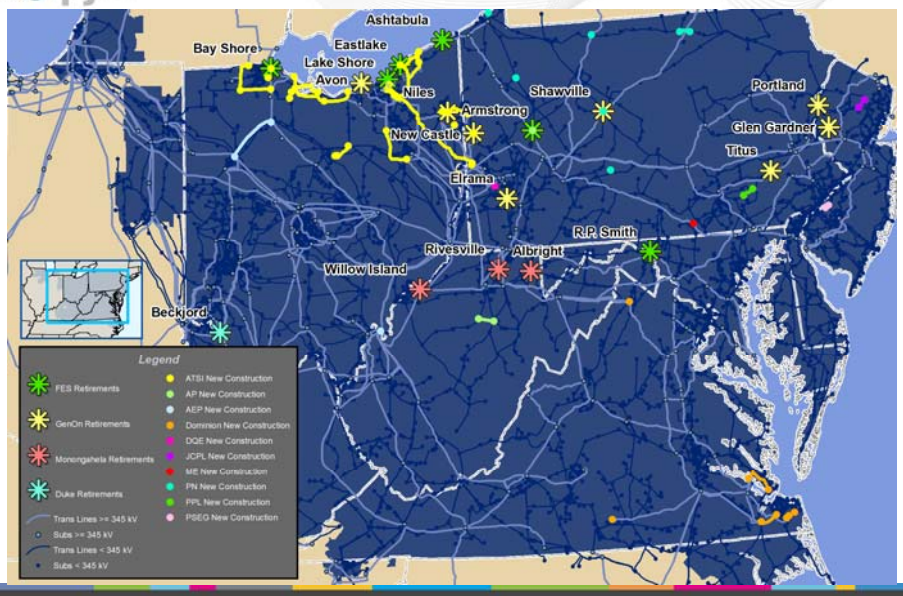
Deactivation Status

Unit	Trans Zone	Requested Deactivation Date	PJM Reliability Status
Albright 1-3; Rivesville 5 & 6; Willow Island 1 & 2	APS	9/1/2012	Reliability Analysis complete - impacts identified - upgrades scheduled to be completed by May 2013. Thus generator can be allowed to deactivate as scheduled on 9/1/2012 assuming all upgrades are still on track to be completed as scheduled.
New Castle 3-5; New Castle Diesels A & B	ATSI	4/16/2015	Reliability Analysis complete - impacts identified - upgrades scheduled to be completed by June 2015. Thus generator can be allowed to deactivate as scheduled.
Portland 1 & 2; Glen Gardner CT 1-8	MetEd	1/7/2015	Reliability Analysis complete - impacts identified - upgrades and operating procedures expected to be in place by May 2015 to allow generators to deactivate as scheduled.
Elrama 1-3	DUQ	6/1/2012	Reliability Analysis complete - impacts identified - upgrades scheduled to be completed by June 2014. Unit deactivated on June 1, 2012.
Elrama 4	DUQ	6/1/2012	Reliability Analysis complete - impacts identified - upgrades scheduled to be completed by June 2014. Evaluating options. Unit to be kept in service until October 1, 2012, pending analysis of outages required to implement required system upgrades
Shawville 1-4; Titus 1-3	PenElec	4/16/2015	Reliability Analysis complete - impacts identified - upgrades and operating procedures expected to be in place by May 2015 to allow generators to deactivate as scheduled.
Niles 1	ATSI	6/1/2012	Reliability Analysis complete - impacts identified - upgrades scheduled to be completed by June 2014. Evaluating options. Unit to be kept in service until October 1, 2012, pending analysis of outages required to implement required system upgrades

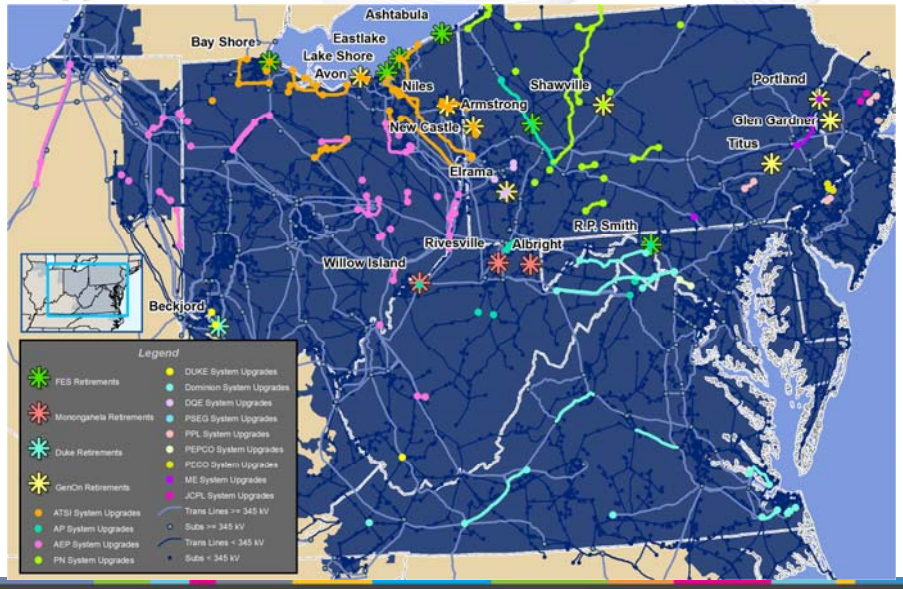
Deactivation Status

Unit	Trans Zone	Requested Deactivation Date	PJM Reliability Status
Niles 2	ATSI	6/1/2012	Reliability Analysis complete - impacts identified - upgrades scheduled to be completed by June 2014. Unit deactivated on June 1, 2012.
Fisk Street 19, Crawford 7 & 8	ComEd	12/31/2012	Reliability Analysis Complete. No impacts identified.
Conesville 3	AEP	12/31/2012	Reliability Analysis complete - impacts identified - upgrades scheduled to be completed by June 2014. PJM continues to finalize details of required upgrades and completion dates.
Big Sandy 1; Clinch River 3; Glen Lyn 5 & 6; Kammer 1-3; Kanawha River 1 & 2; Muskingum River 1-4; Pickway 5; Sporn 1-4; Tanner Creek 1-3	AEP	6/1/2015	Reliability Analysis complete - impacts identified - upgrades scheduled to be completed by June 2015.
Avon Lake 7 & 9	ATSI	4/16/2015	Reliability Analysis complete - impacts identified - upgrades scheduled to be completed by May 2015
Sewaren 1-4	PSEG	6/1/2015	Reliability Analysis complete. No impacts expected with PSEG contemplating re-use of Capacity Rights for a new generation project
Cedar 1 & 2; Deepwater 1 & 6; Missouri Ave CT B, C & D	AE	5/31/2015	Reliability Analysis complete - impacts identified - upgrades scheduled to be completed by May 2015
Hutchings 1 & 2	Dayton	6/1/2015	Reliability Analysis complete. No impacts identified
Smart Paper (St. Clair)	DEOK	8/10/2012	Reliability Analysis complete. No impacts identified
Hutchings 4	Dayton	6/1/2013	Reliability Analysis Underway

PJM Board Approved – New Lines



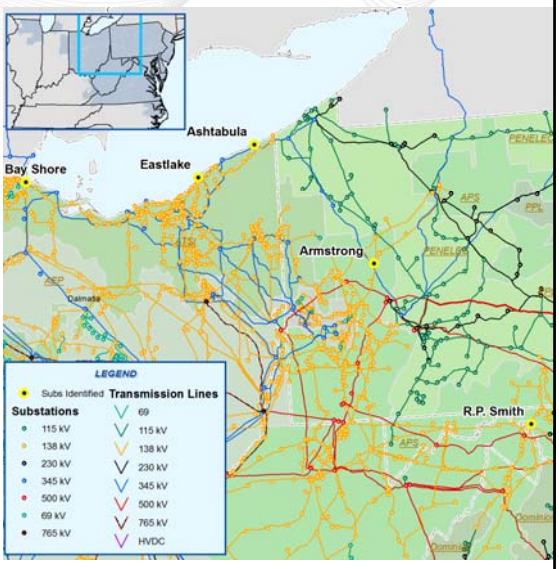
PJM Board Approved – Major Upgrades



Ohio Area Upgrades

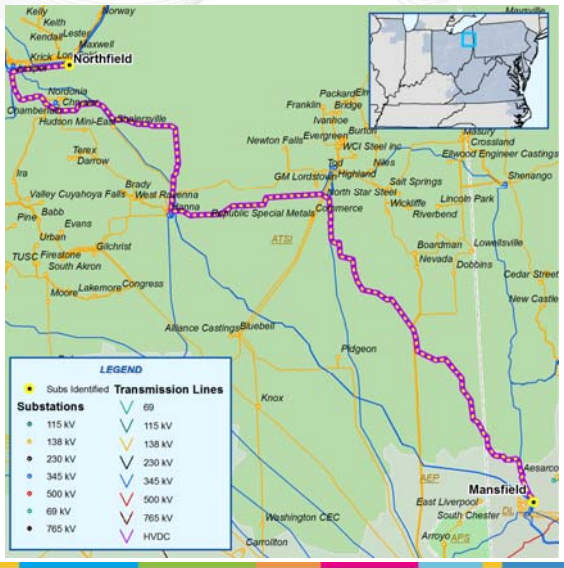
ATSI Transmission Zone Summary

- Significant thermal and reactive problems (39 projects)
- Required upgrades include new 345 kV lines, new 345/138 kV substations, reactive
- Eastlake 1-5 and Lakeshore 18 converted to synchronous condensers
- RMR for Eastlake 1-3, Ashtabula 5 and Lake Shore 18
- Niles and Elrama



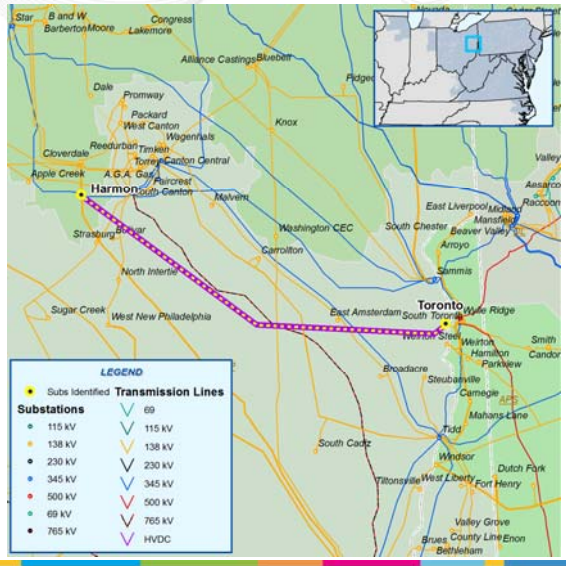
ATSI Transmission Zone Reinforcement

- Load Deliverability
- Create a new Northfield Area 345 kV switching station by looping in the Eastlake – Juniper 345 kV line and the Perry - Inland 345 kV line.
- Estimated Project Cost: $37.5M
- Build a new Mansfield - Northfield Area 345 kV line.
- 115 miles - ~80 miles will use open position on a DCTL, remaining line to follow existing 345 kV line on new DCTL structures
- Estimated Project Cost: $184.5M
- Projected in-service date: 6/1/2015.



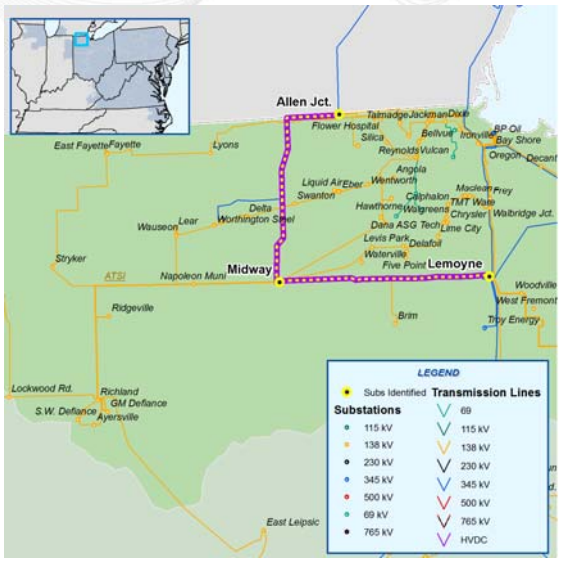
ATSI Transmission Zone Reinforcement

- Build new Toronto 345/138 kV substation by looping in the Sammis – Wylie Ridge 345 kV line and tie in four 138 kV lines
- Estimated Project Cost: $41.8M
- Build a new Toronto-Harmon 345kV line
- ~56 miles; all new ROW
- Estimated Project Cost: $218.3M
- Projected in-service date: 6/1/2017.



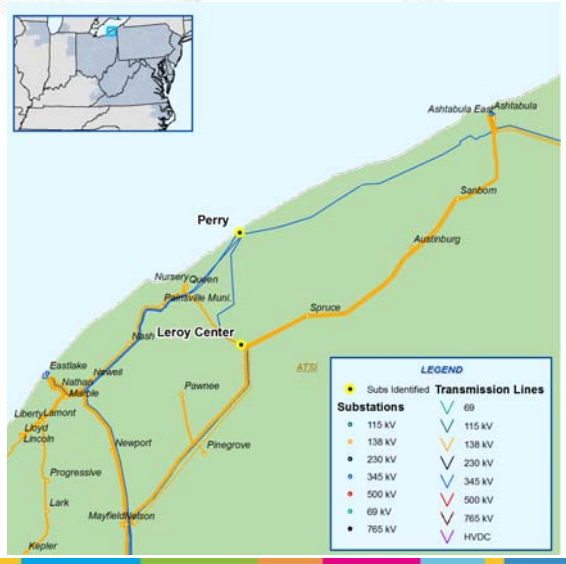
ATSI Transmission Zone Reinforcement

- N-1-1 Thermal: Loss of Allen Junction-Lulu 345kV + Lemoyne-Five Points 345kV results in 102% overload on Lemoyne-BG Tap 138kV
- Build new Allen Junction - Midway - Lemonye 345kV line (48 miles of open tower position)
- Estimated Project Cost: $86.3M
- Proposed in-service date: 6/1/2016



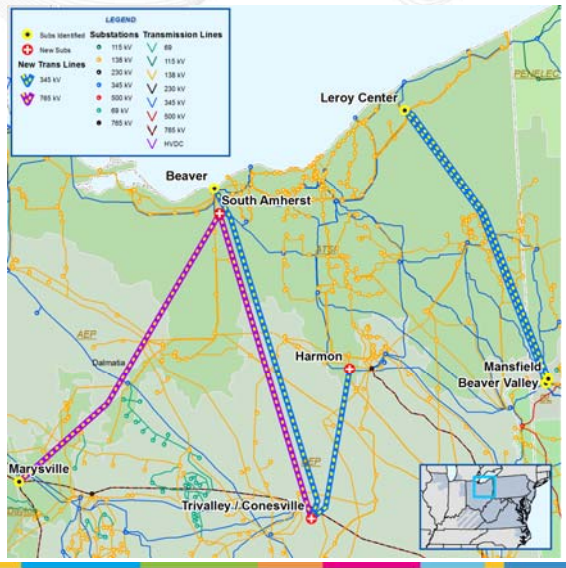
ATSI Transmission Zone Reinforcement

- Build a new Leroy Center 345/138 kV substation by looping in the Perry – Harding 345 kV line.
- Estimated Project Cost: $46 M
- Projected in-service date: 6/1/2016.
- Two new 345 kV lines from Leroy Center to Mansfield / Beaver Valley area under consideration
- ~115 miles; all new ROW
- Estimated cost $393 million



Retirement Upgrade Alternative Analysis

- Marysville – South Amherst 765 kV
  - Also includes 2-5 miles of 345 kV from South Amherst – Beaver 345 kV
- Trivalley – South Amherst 765 kV
  - Trivalley will intersect Kammer – Vassell 765 kV near Conesville 345 kV
  - Also includes 2-5 miles of 345 kV from South Amherst – Beaver 345 kV
- Conesville – Beaver 345 kV
- Conesville – Harmon 345 kV
- Beaver Valley - Leroy Center 345kV + Mansfield – Leroy Center 345kV line



AEP Deactivations

Conesville 3

Requested deactivation date: 12/31/2012

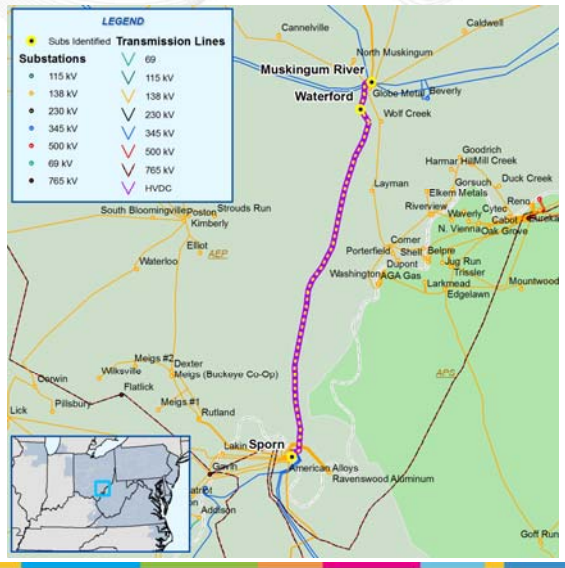
Big Sandy 1; Clinch River 3; Glen Lyn 5 & 6; Kammer 1-3; Kanawha River 1 & 2; Muskingum River 1-4; Pickway 5; Sporn 1-4; Tanner Creek 1-3

Requested deactivation date: 6/1/2015

AEP Deactivations - Conesville 3; Big Sandy 1; Clinch River 3; Glen Lyn 5 & 6; Kammer 1-3; Kanawha River 1 & 2; Muskingum River 1-4; Pickway 5; Sporn 1-4; Tanner Creek 1-3

AEP Transmission Zone

- Overload on Waterford – Muskingum River 345 kV line in generation deliverability and N-1-1 analysis involving a combination of outages including loss of Belmont – Kammer 765 kV and/or Marysville – Flatlick 765 kV line
- Proposed Solution: Reconductor or rebuild Sporn – Waterford – Muskingum River 345 kV line
- Estimated Project Cost: $200M
- Expected in-service date: 6/1/2015



AEP Deactivations - Conesville 3; Big Sandy 1; Clinch River 3; Glen Lyn 5 & 6; Kammer 1-3; Kanawha River 1 & 2; Muskingum River 1-4; Pickway 5; Sporn 1-4; Tanner Creek 1-3

AEP Transmission Zone

- Address several overloads for various contingencies under generation deliverability and N-1-1 analysis including:
  - Carbondale – Carbondale Tap 138 kV
  - Amos – Dalewood 138 kV
  - Chemical #1 – Ortin 138 kV
  - Amos – Poca 138 kV
  - Chemical #1 – Ortin 138 kV
  - Amos – Tackett Creek 138 kV
  - Cabin Creek – South Ridge 138 kV
  - Capitol – Chemical #2
  - Amos – Turner #2
- Proposed Solution: Rebuild Amos – Kanawah River 138 kV corridor
- Estimated Project Cost: $150M
- Expected in-service date: 6/1/2015