Energy Markets

National Association of Regulatory Utility Commissioners

Energy Regulatory Partnership Program

between

The National Agency for Energy Regulation of Moldova

and

The Missouri Public Service Commission

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Public Utilities Commission of Ohio
Executive Director, Ohio Power Siting Board

National Association of Regulatory Utility Commissioners

USAID FROM THE AMERICAN PEOPLE

Why Regulation?

- Electricity has historically been considered a "natural monopoly"
- Entry into this market required huge investments in infrastructure
- Electricity was considered a "public good"
- Electric Infrastructure is very capital intensive, which creates barriers to entry for potential investors

FEDERAL

vs.

STATE

JURISDICTION

and

MARKET STRUCTURES

ELECTRIC WHOLESALE

Federal Energy Regulatory Commission Order 888 (1996) and Order 2000 (1999)

- Determined the public interest would be best served by a competitive wholesale market
- FERC asserts jurisdiction over transmission (pricing)
- Code of Conduct
- Same Time Information System
- Provided for non-discriminatory and open-access on the transmission system/Open Access Transmission Tariff
- Required transmission owners to join an Independent System Operator

  ISO: "An independent, Federally regulated entity established to coordinate regional transmission in a non-discriminatory manner and ensure the safety and reliability of the electric system."

FERC Oversight - Wholesale

- No direct jurisdiction over generation
- PJM administered capacity market
- PJM administered energy market
- Administrative Market Construct
- Sales for Resale
- Bulk Power System
- Transmission Tariffs
- Market Monitoring
- Reliability Assurance (North American Electric Reliability Council and Standards)

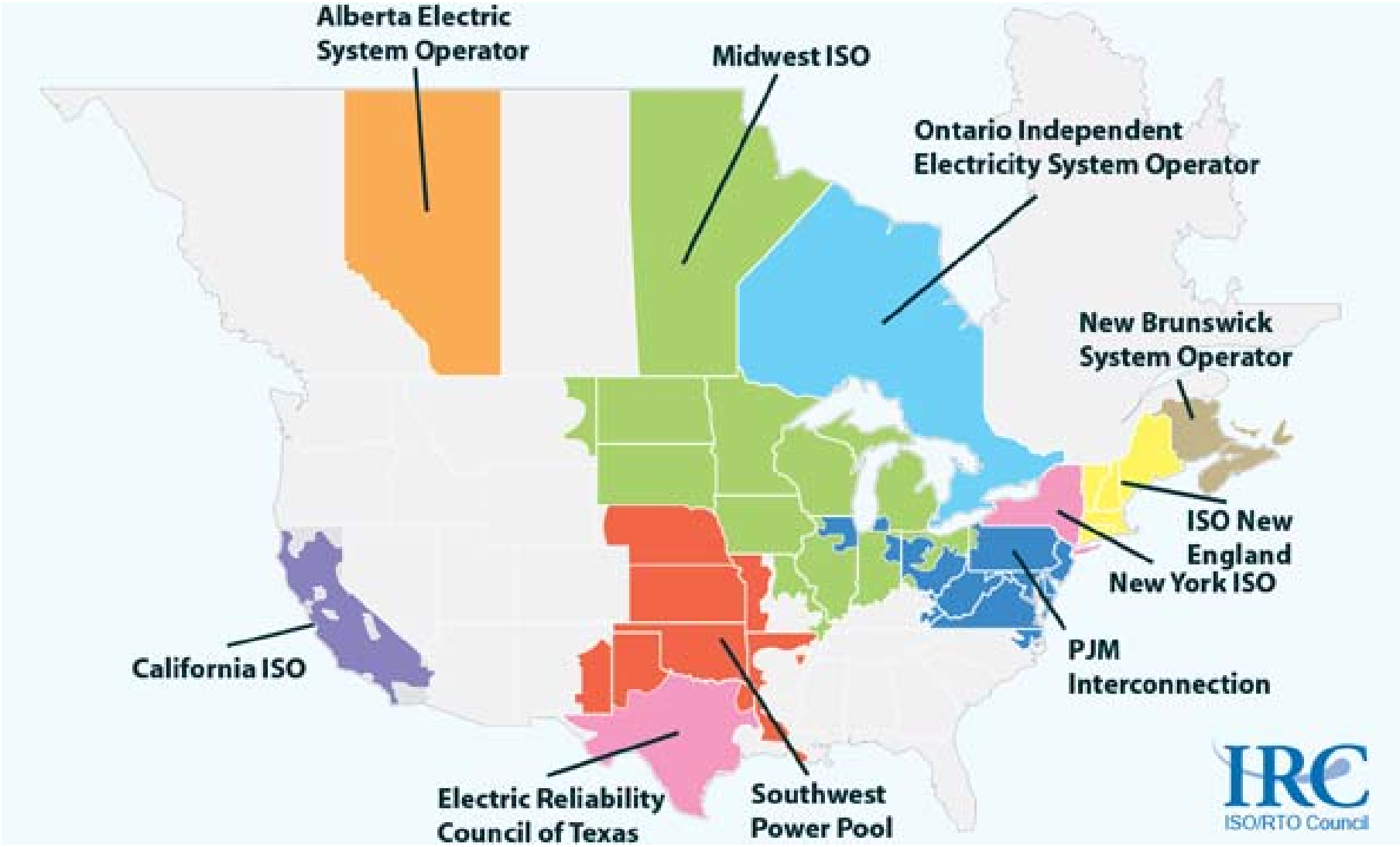
Regional Transmission Organization (RTO) is:

- Independent from market participants
- Responsible for grid operations and reliability
- Responsible for transmission service within region

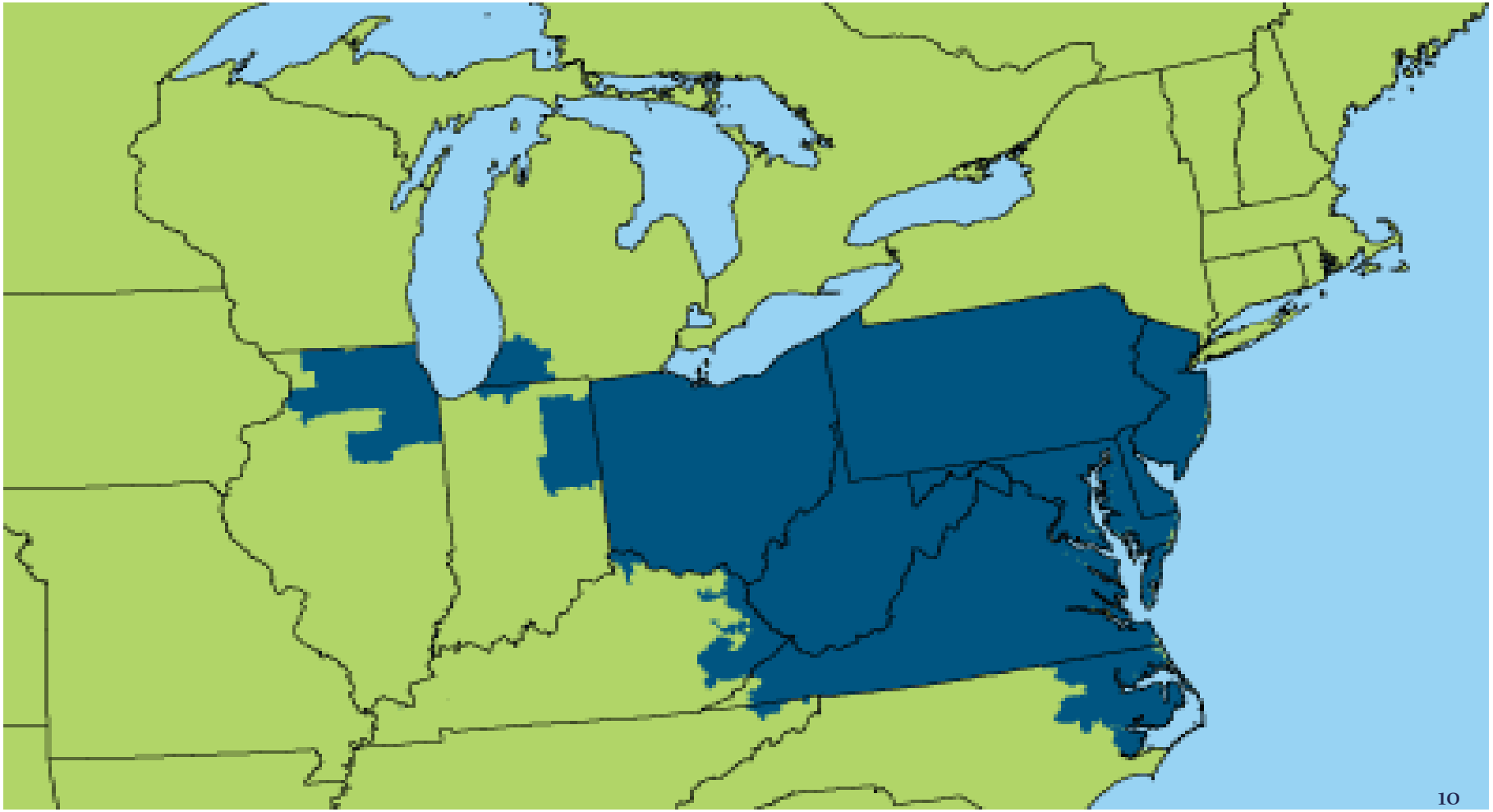
RTO Functions

- Grid Operation
  - Non-discriminatory treatment
  - Monitoring transmission system
  - Reliability of the system
  - Generation and load balance responsibilities
- Market Operation
  - Capacity
  - Energy
  - Ancillary Services
- Regional Transmission Planning and Expansion
  - Reliability requirements
  - Operational
  - Economic

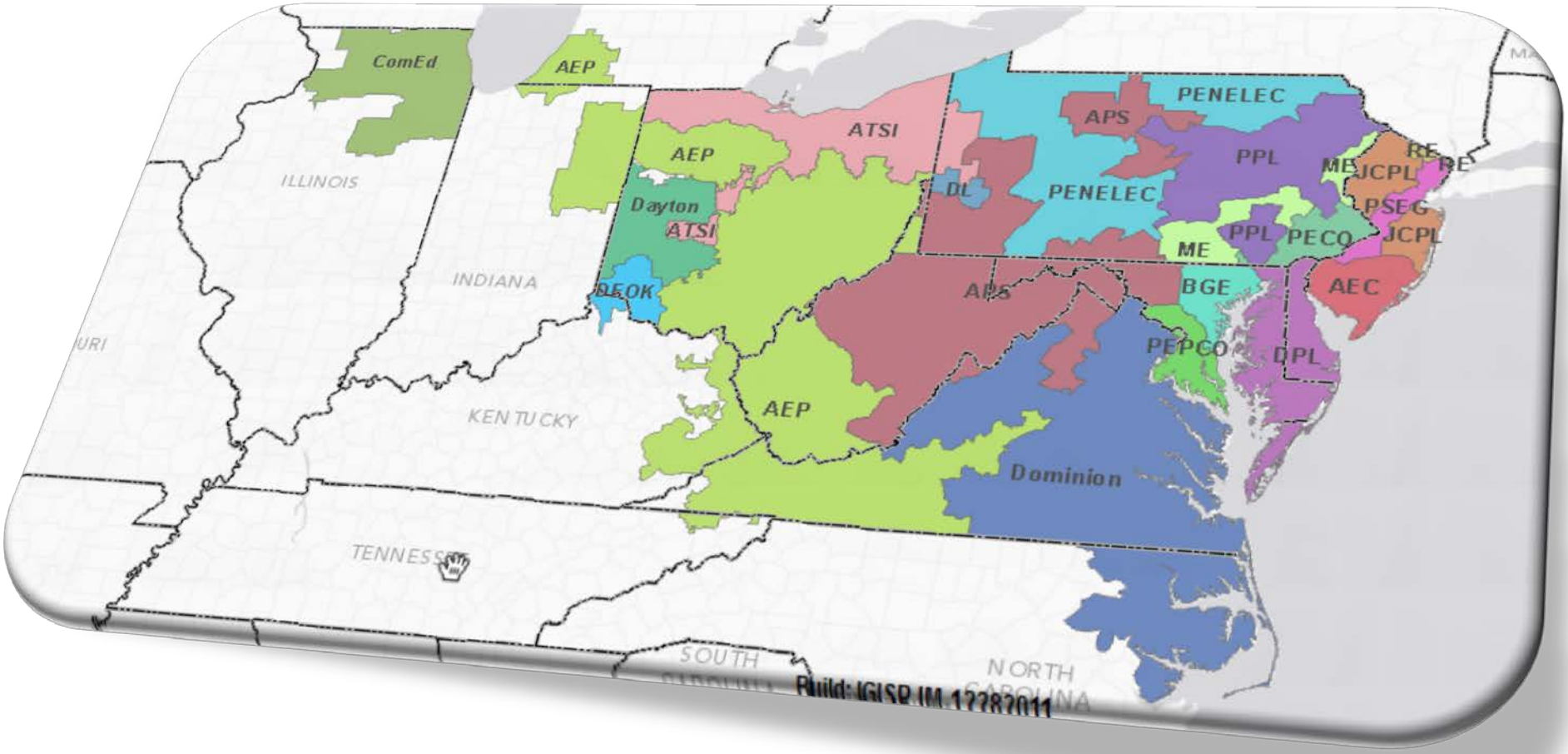
Nine Major North American RTOs / ISOs



PJM Regional Transmission Organization



Transmission Owner Zones



Dos and Don'ts

Regional Transmission Organization

- Operation of the assets
- Maintenance scheduling and coordination
- Match load and generation
- Non-profit

Local Utility

- Owns assets
- Performs maintenance
- Directly serves end use customers
- Publicly traded company

Regional Transmission Organization

Pricing

and

Planning

Capacity vs. Energy

Capacity

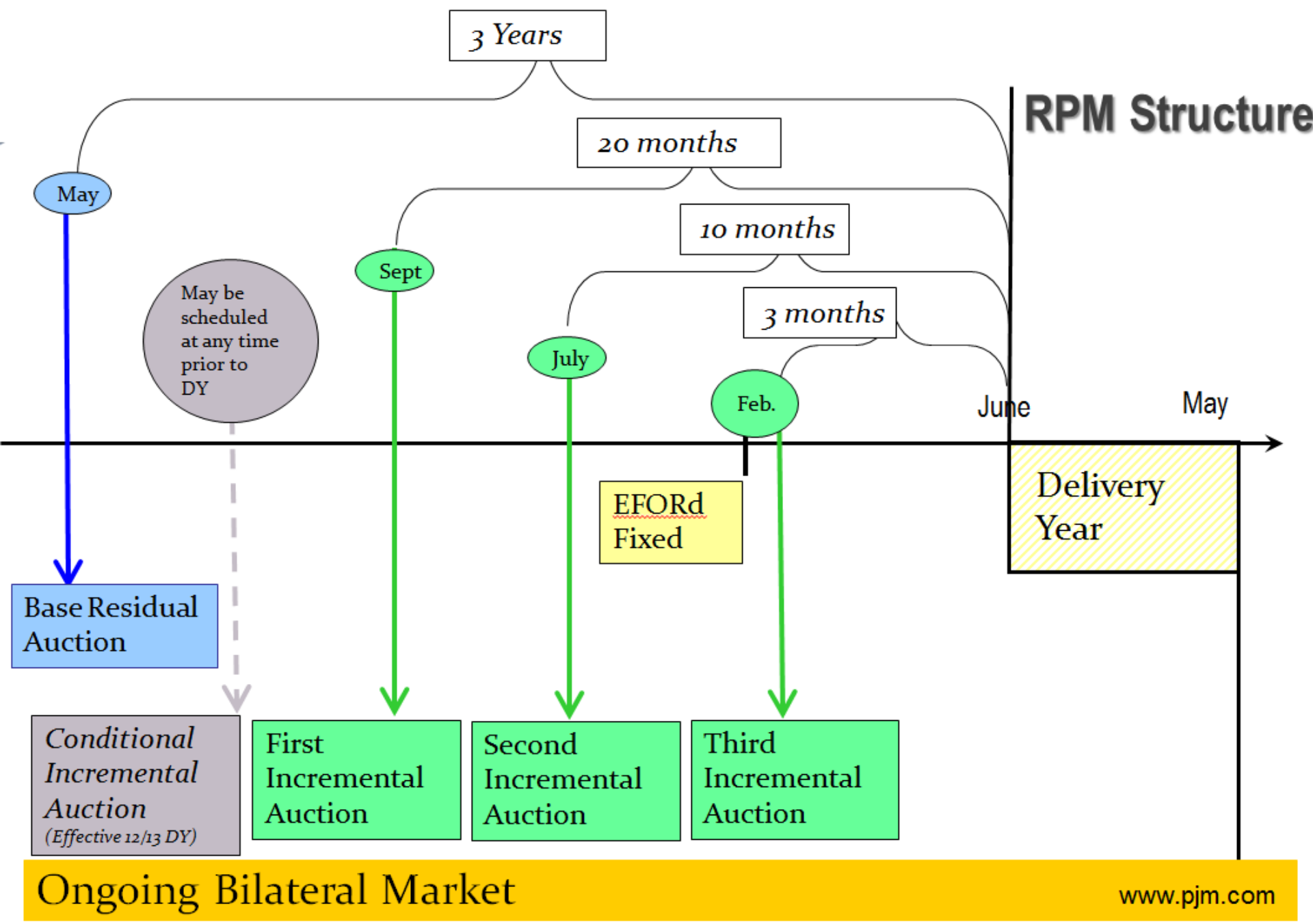
- A resource commitment to provide energy
- Capacity revenues paid to committed resource whether or not energy is produced by resource
- Participation in Reliability Pricing Model Auction
- Daily product

Energy

- Generation of electrical power over a period of time
- Energy revenues paid to resource based delivery
- Participation in Day-Ahead & Real-Time Energy Markets
- Hourly product

Wholesale Capacity Markets Reliability Pricing Model (RPM)

- Bid Based Auction Process
- Annual Product
- Three years in advance resource commitment to meet future peak load
- Capacity Bids
  - Generation
  - Demand Response
  - Energy Efficiency
- Transparency of information
- Places value on capacity resources


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
(Effective 12/13 DY)
First Incremental Auction
Second Incremental Auction
Third Incremental Auction
Ongoing Bilateral Market
www.pjm.com

RPM Auctions

Activity	Purpose	Cost of Procurement
Base Residual Auction	Procurement of Regional Transmission Operator Obligation less an amount reserved for short lead time resources, less Fixed Resource Requirement Obligation	Allocated to Load Serving Entities through Locational Reliability Charge
1st Incremental Auction 2nd Incremental Auction 3rd Incremental Auction	Allows for: (1) replacement resource procurement (2) increases and decreases in resource commitments due to reliability requirement adjustments; and (3) deferred short-term resource procurement	Allocated to resource providers that purchased replacement resources and Load Serving Entities through Locational Reliability Charge
Conditional Incremental Auction	Procurement of additional capacity in a Locational Deliverability Area (constrained area) to address reliability problem that is caused by a significant transmission line delay	Allocated to Load Serving Entities through Locational Reliability Charge

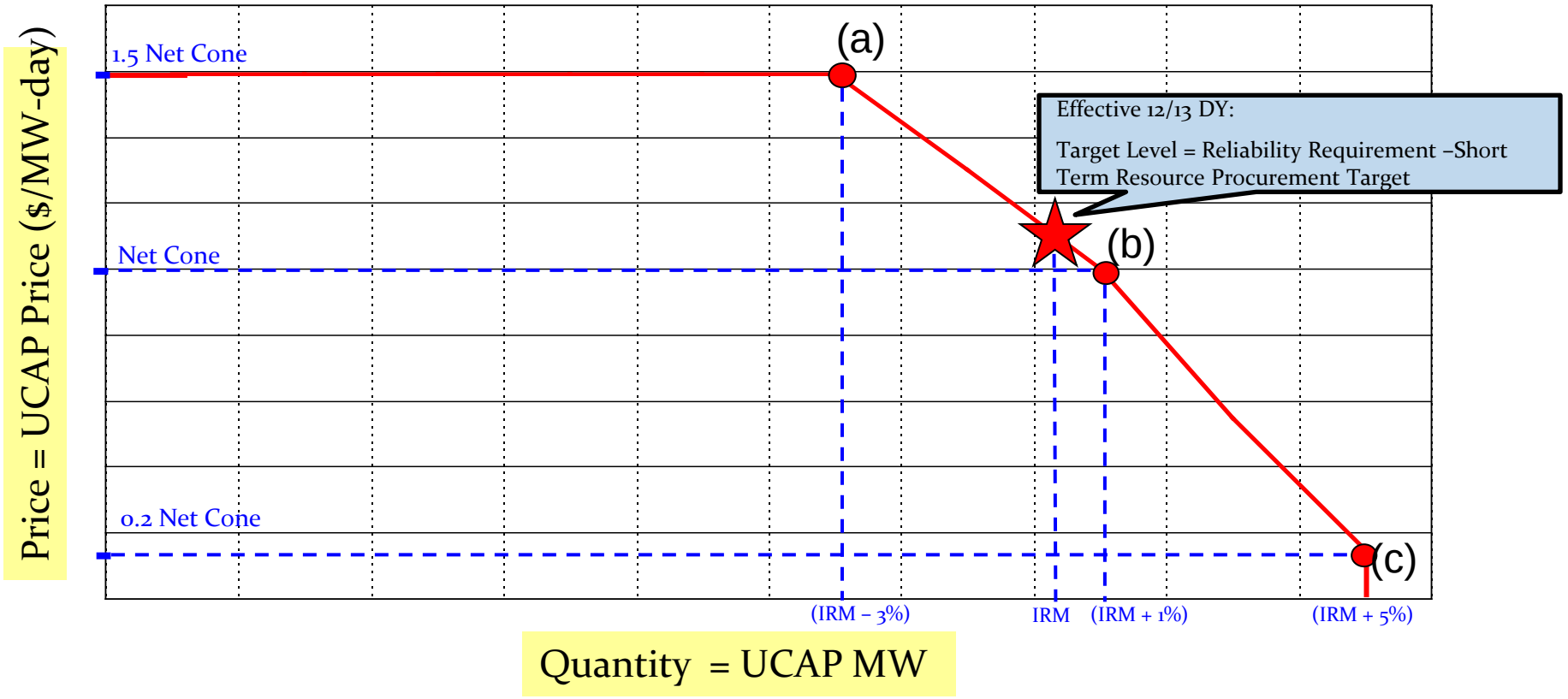
Resource Adequacy Requirement

- Determines the amount of capacity resources required to serve the forecast peak load taking into consideration the reliability criterion
- The reliability criterion is based on Loss of Load Expectation (LOLE) not exceeding one event in ten years
- An Installed Reserve Margin (IRM) satisfies the reliability criterion, adjusted annually, currently 15.2%
- Resource Adequacy Requirement = Forecast Peak Load * (1+ IRM)

- PJM determines pricing sub-regions (i.e., locational deliverability areas) to be included in RPM Auctions to recognize and quantify the locational value of capacity
- These would be considered constrained areas due to import capability limitations

- The Variable Resource Requirement (VRR) Curve is a downward sloping demand curve that relates the maximum price for a given level of capacity resource commitment relative to reliability requirements
- If resources are less than the reliability requirement, the price is higher and lower when the resources are in excess
- VRR Curves are determined for the PJM RTO and for each constrained Locational Deliverability Area (LDA) within the PJM region

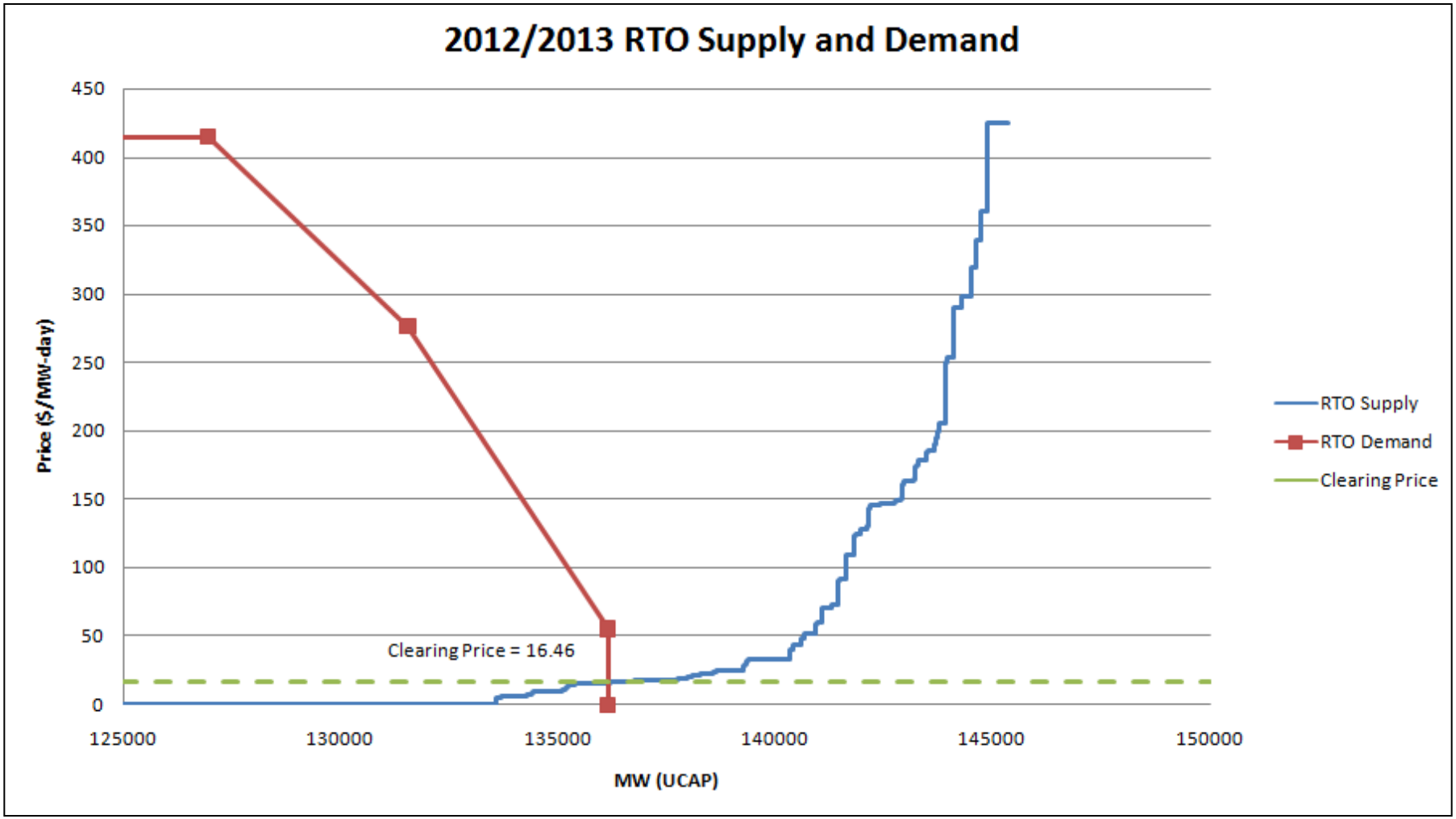
Illustrative Example of a VRR Curve



A VRR Curve is defined for the PJM Region.

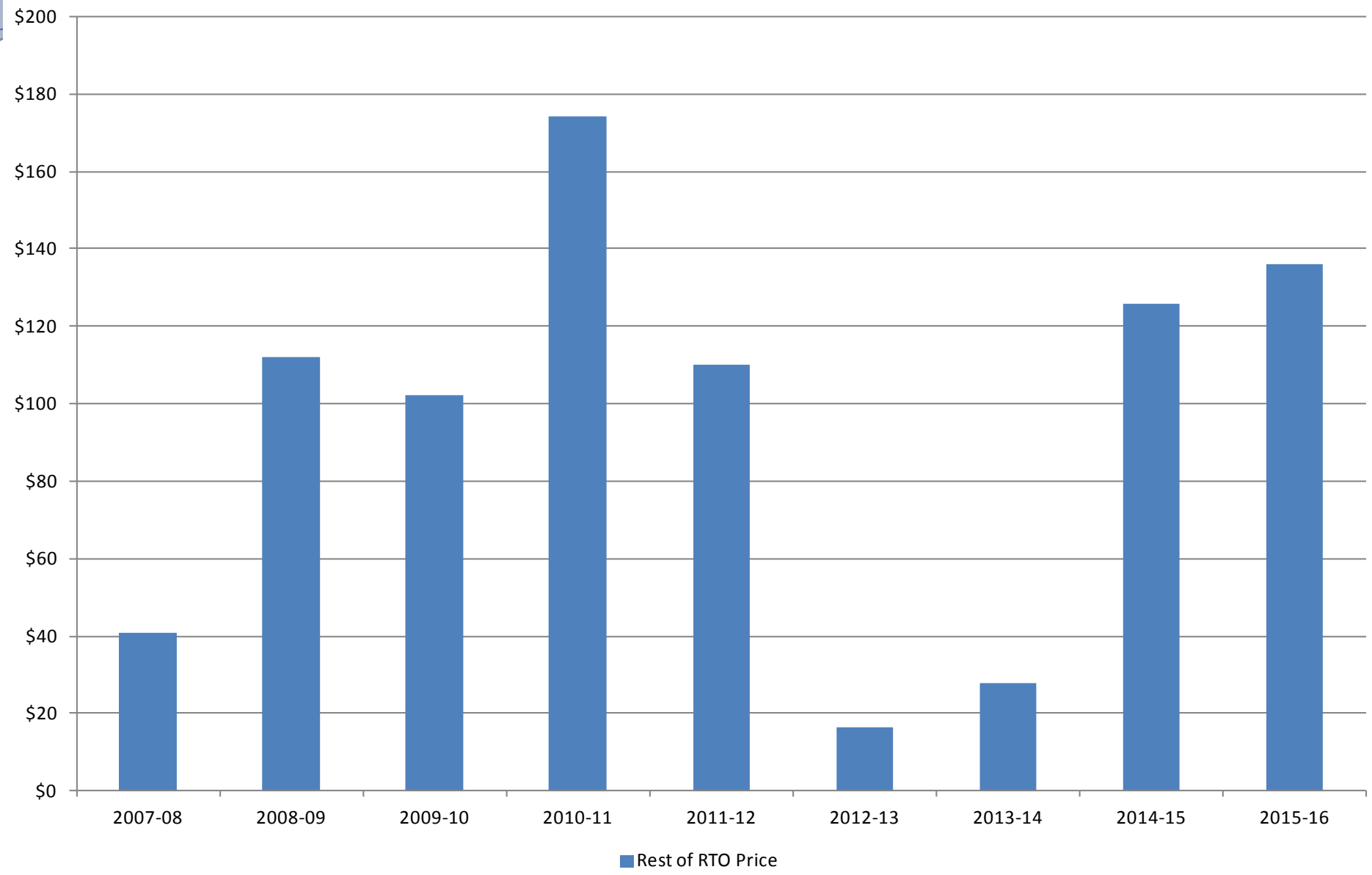
Individual VRR Curves are defined for each Constrained LDA.

Clearing 2012/2013 Base Residual Auction



Clearing determined by the intersection of the supply and the demand curves.

Rest of RTO Capacity Prices in $/MW-Day



PJM Energy Markets

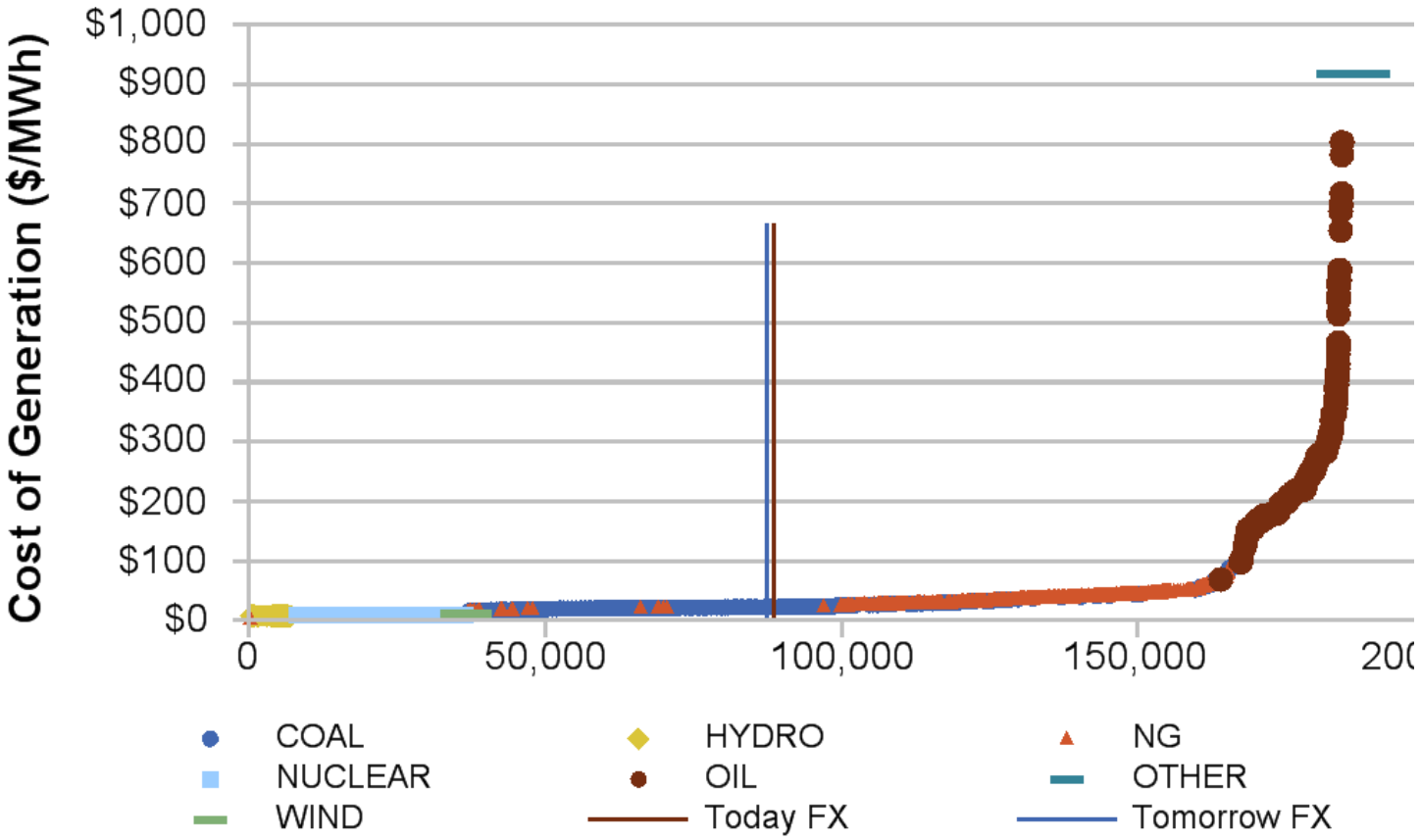
- Day Ahead
- Hour Ahead
- Bid Based
- Security Constrained Dispatch of all Generating Plants in Footprint

Security Constrained Economic Dispatch

- Ensure sufficient ***generation*** is available to satisfy the demand at any hour of the day

- Monitor, operate and control the high voltage ***transmission*** system in a reliable manner

PJM Dispatch Curve by Fuel Type: 10/06/11



Locational Marginal Pricing

- Cost of serving the next MW of load at a given location
- Lowest production cost of generation available
- Recognizes physical transmission limitations
- Physical flow, not contract path

Generation Marginal Cost

+

Transmission Congestion Cost

+

Cost of Marginal Losses

=

LMP

Energy Price

- System-wide price
- Optimal dispatch (no congestion or losses taken into account)
- Intersection of the Supply and Demand Curve
- Day ahead and real time calculations

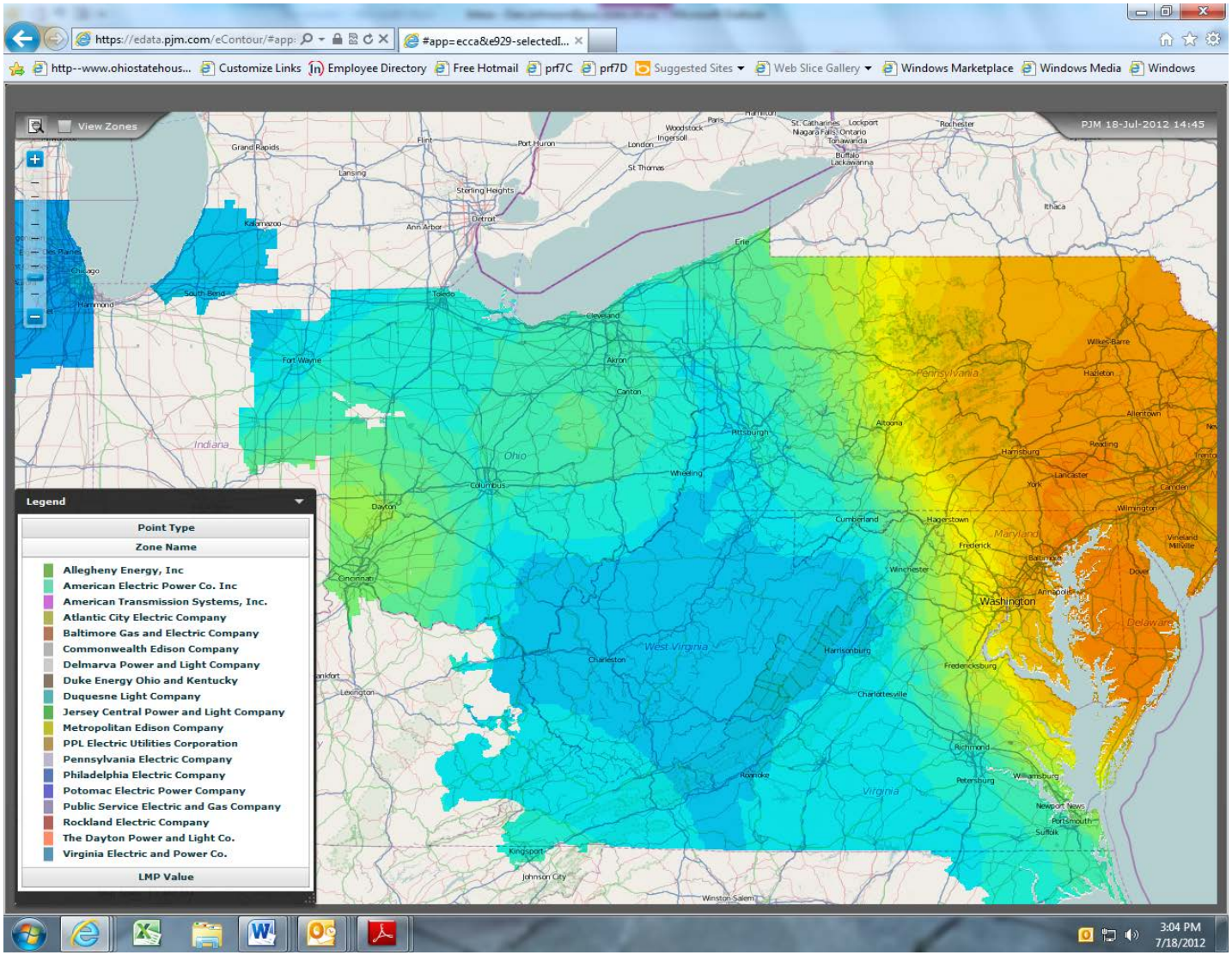
Transmission Congestion Price

- Price of congestion/constraints taken into account, calculated using cost of marginal units on a bus by bus basis
- No constraints = no cost assigned to congestion
- Day ahead and real time calculations

Transmission Losses

- Price of marginal losses reflected
- Location by location basis, calculated using penalty factors
  - Distance
  - Voltage
  - Thermal rating
- Day-ahead and real-time calculations

PJM Energy Market



LMP
7/18/2012,
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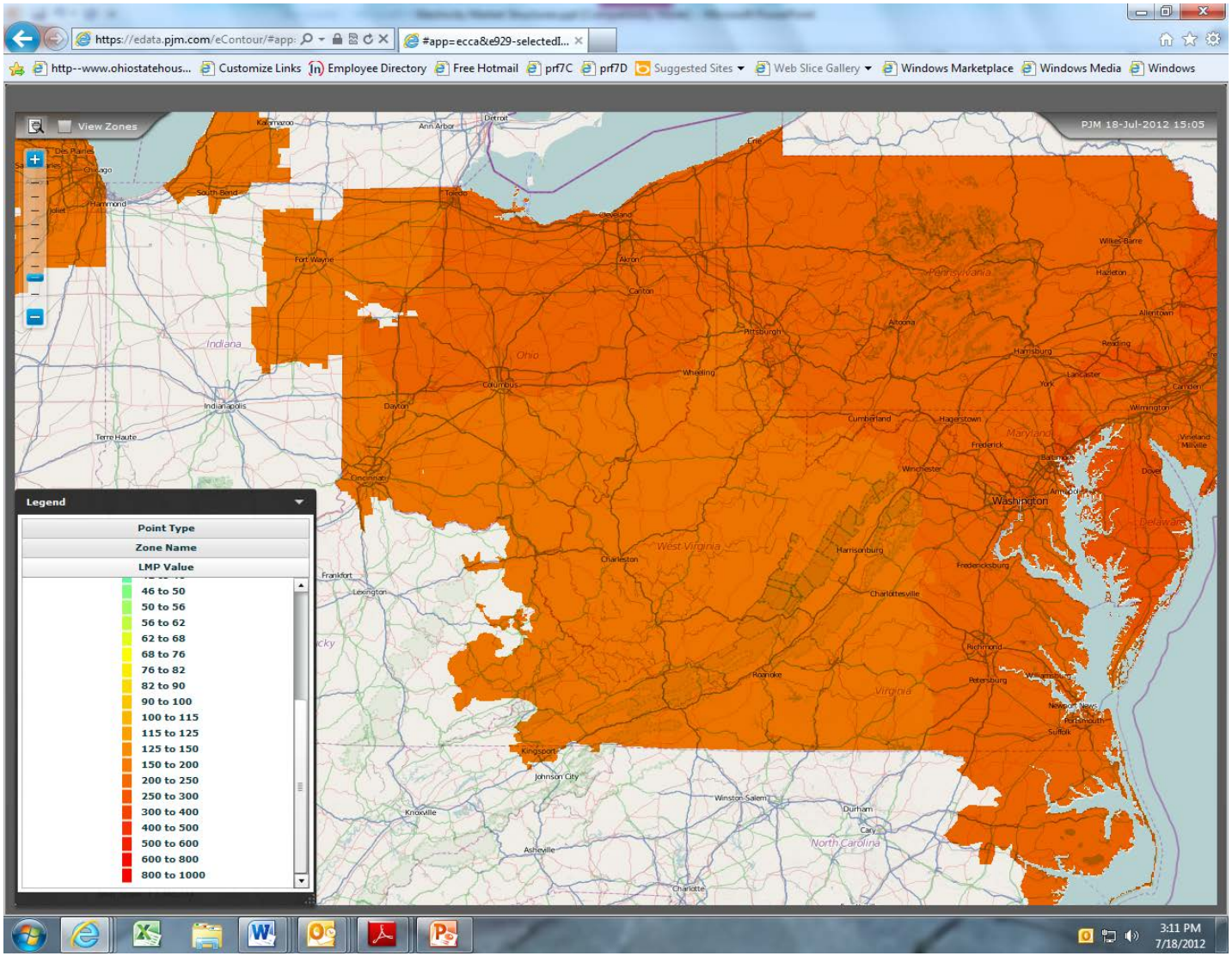
PJM Energy Market



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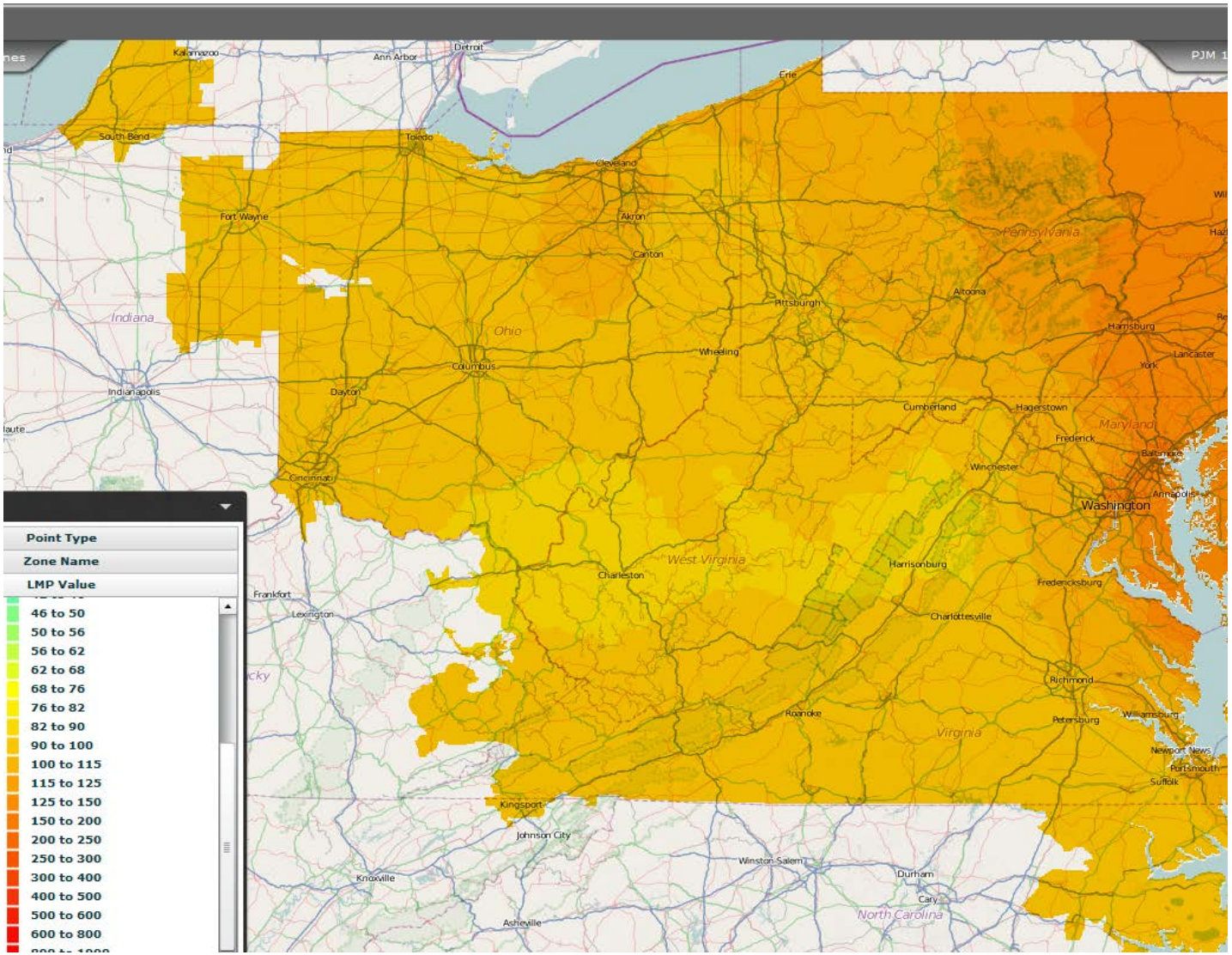
PJM Energy Market



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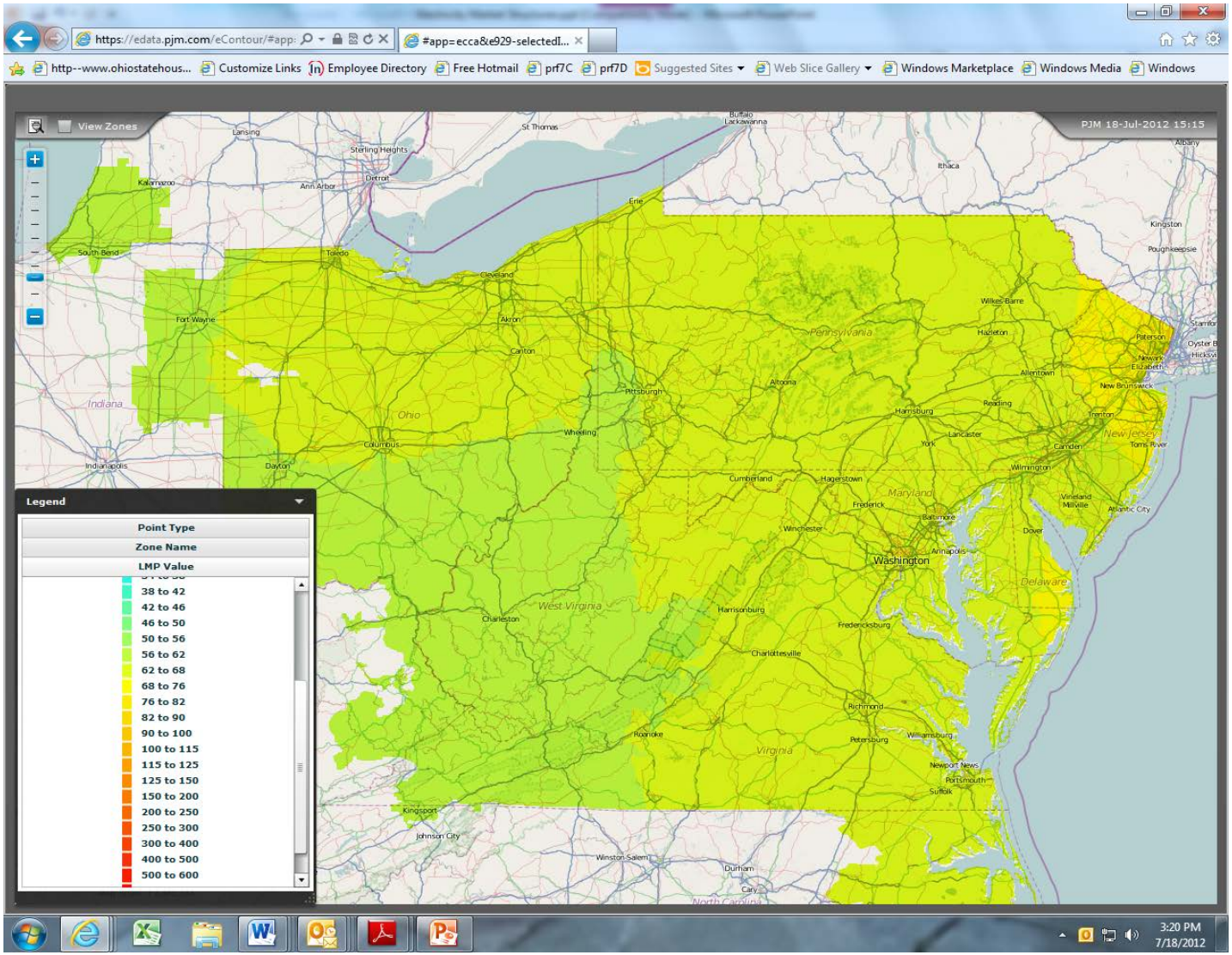
PJM Energy Market



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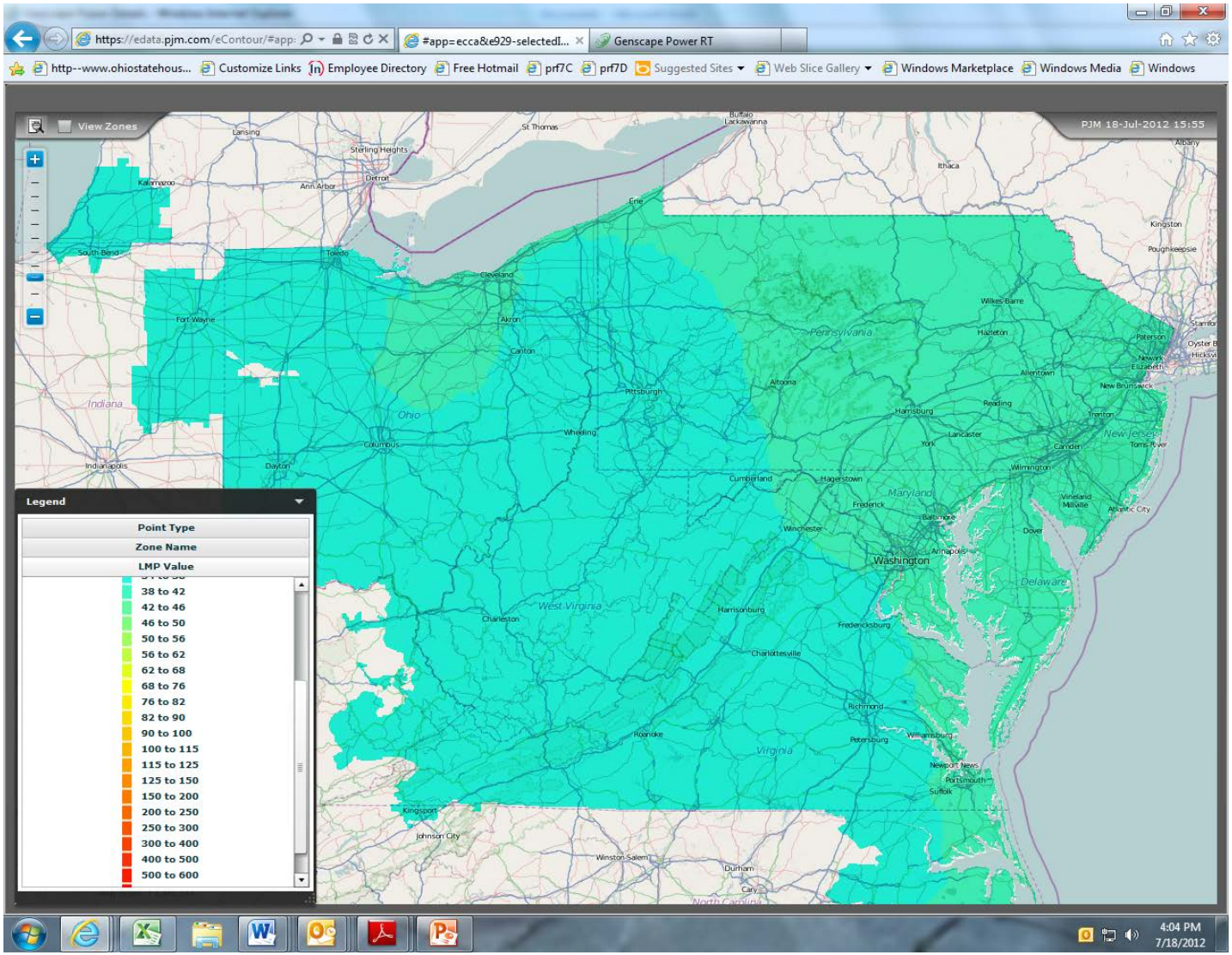
PJM Energy Market



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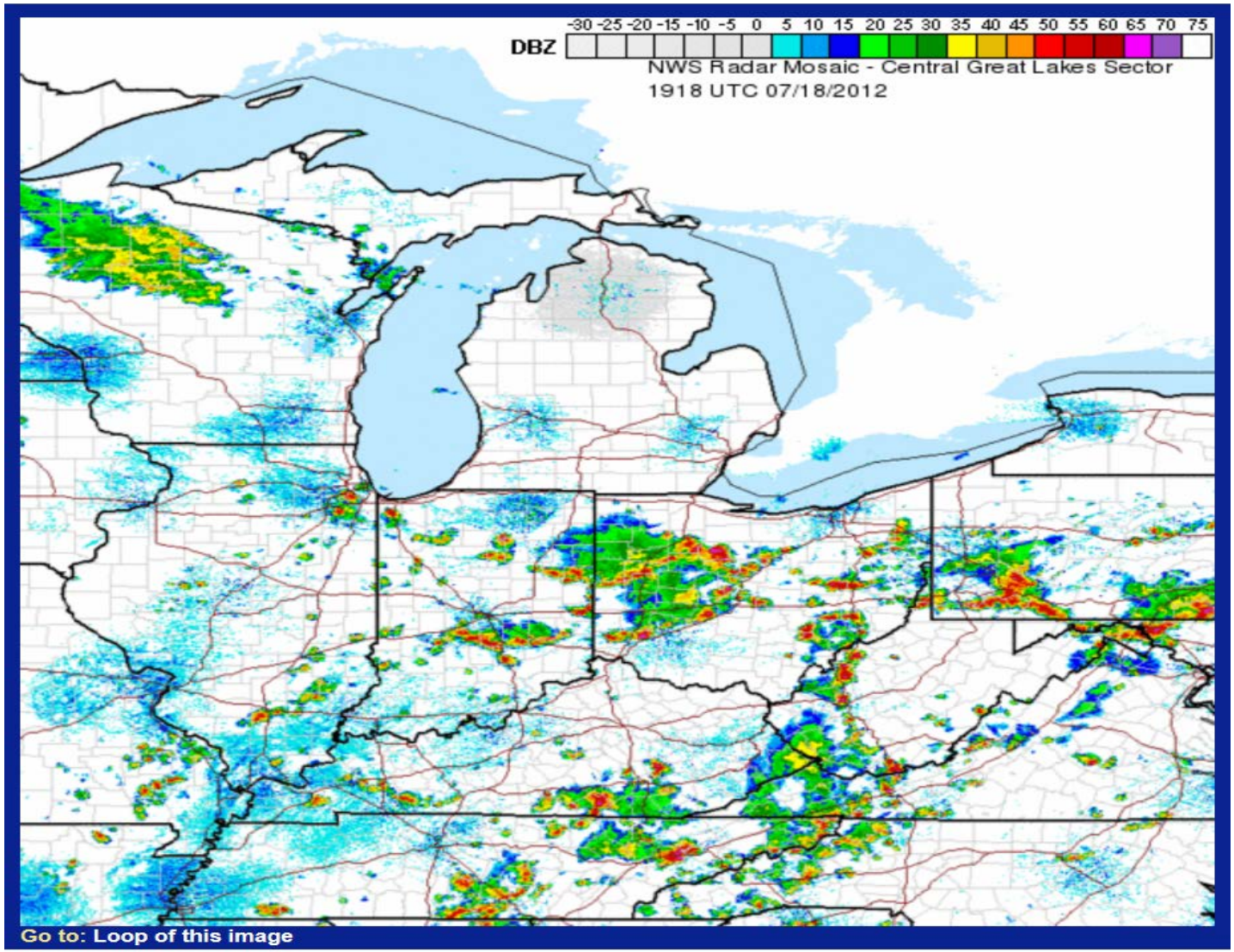
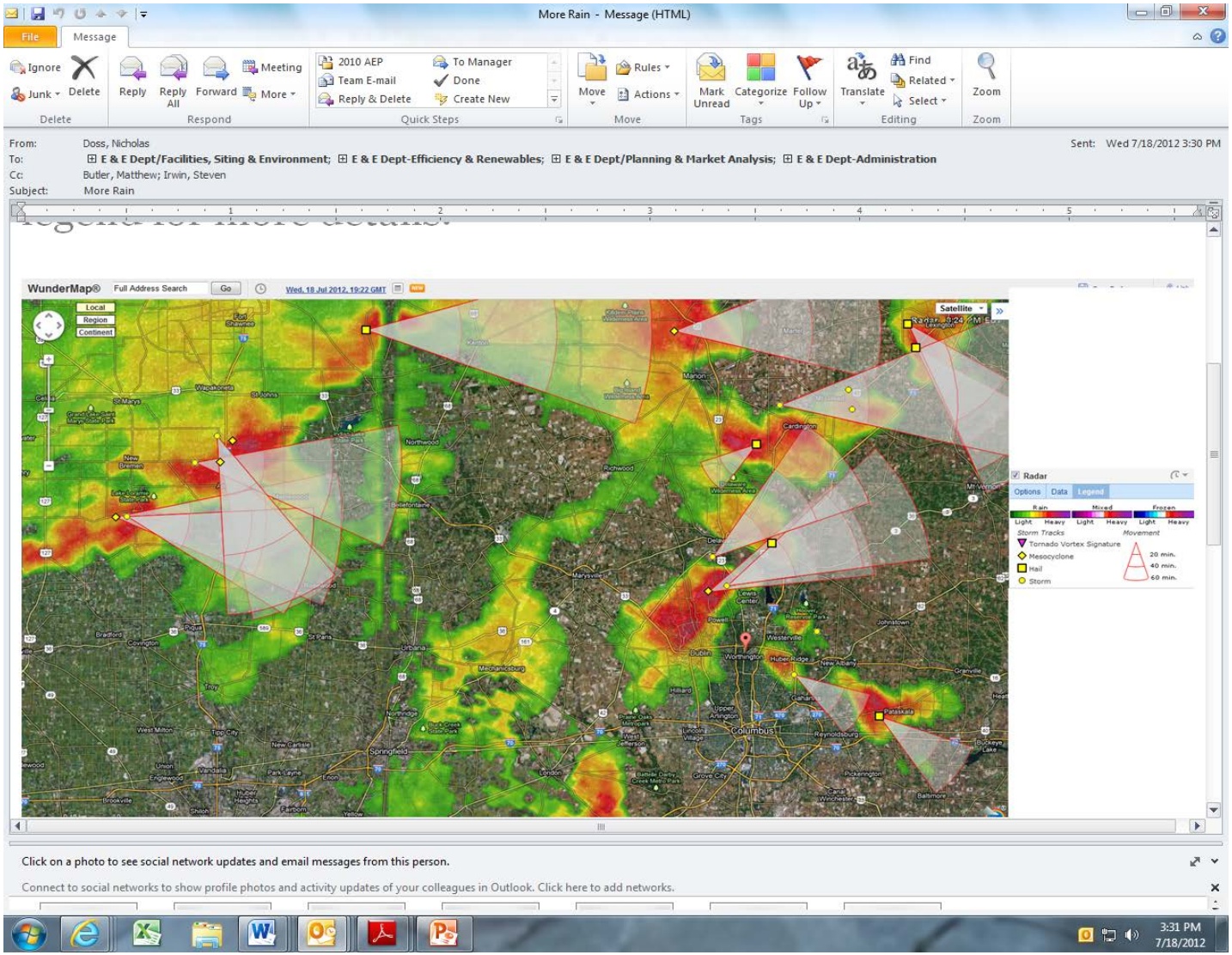
Western PJM

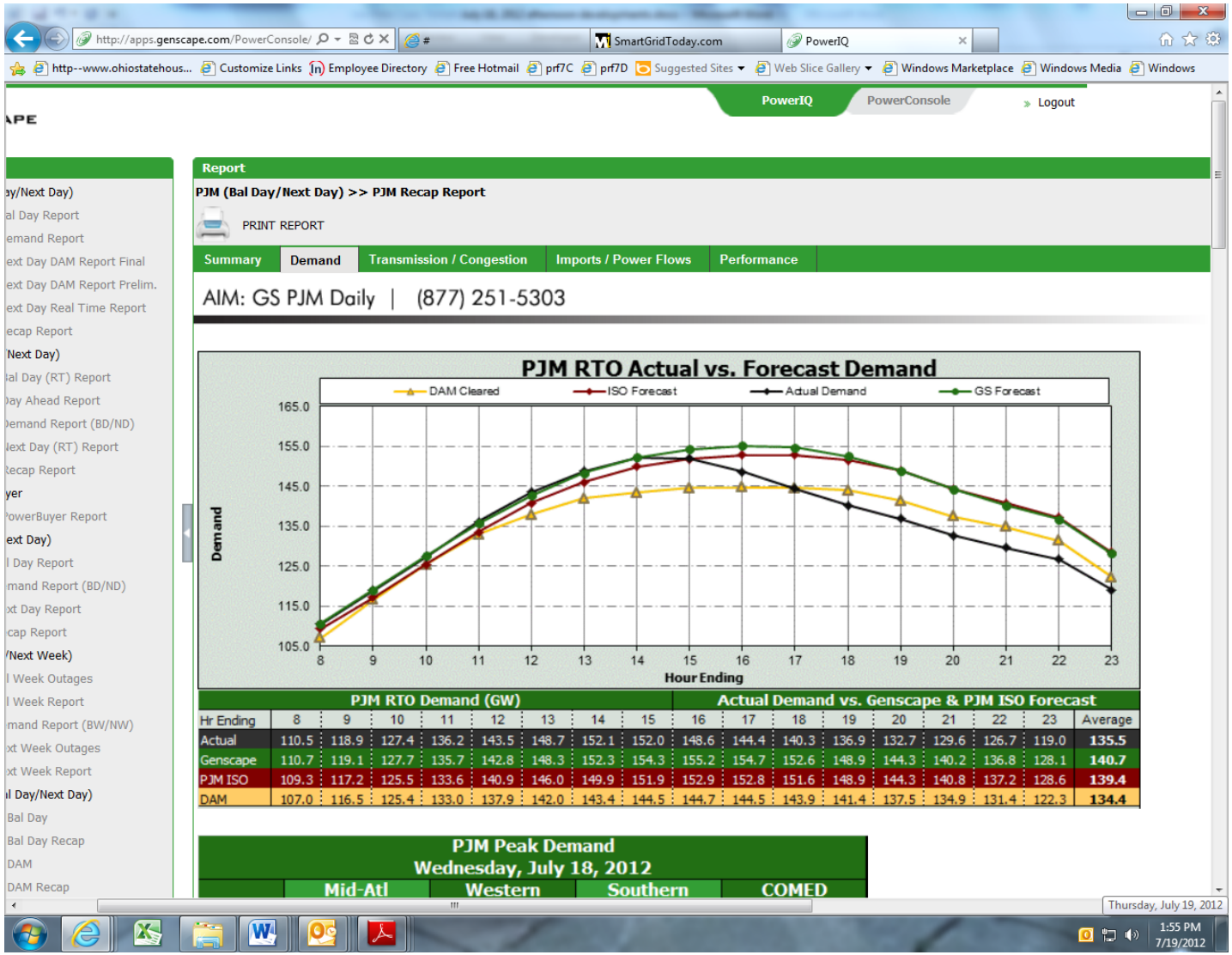


4 PM Weather

Storm Tracks



Next Day Recap - Genscape



Financial Transmission Rights

- Financial Transmission Rights Auctions held
- Financial instruments
- Awarded to winning bidders
- Entitles winner to revenues based on the hourly Day Ahead congestion price differences across a path
- Hedging mechanism to protect against price uncertainty
- Can be traded separately from the transmission service
- Independent of energy delivery

Auction Revenue Rights

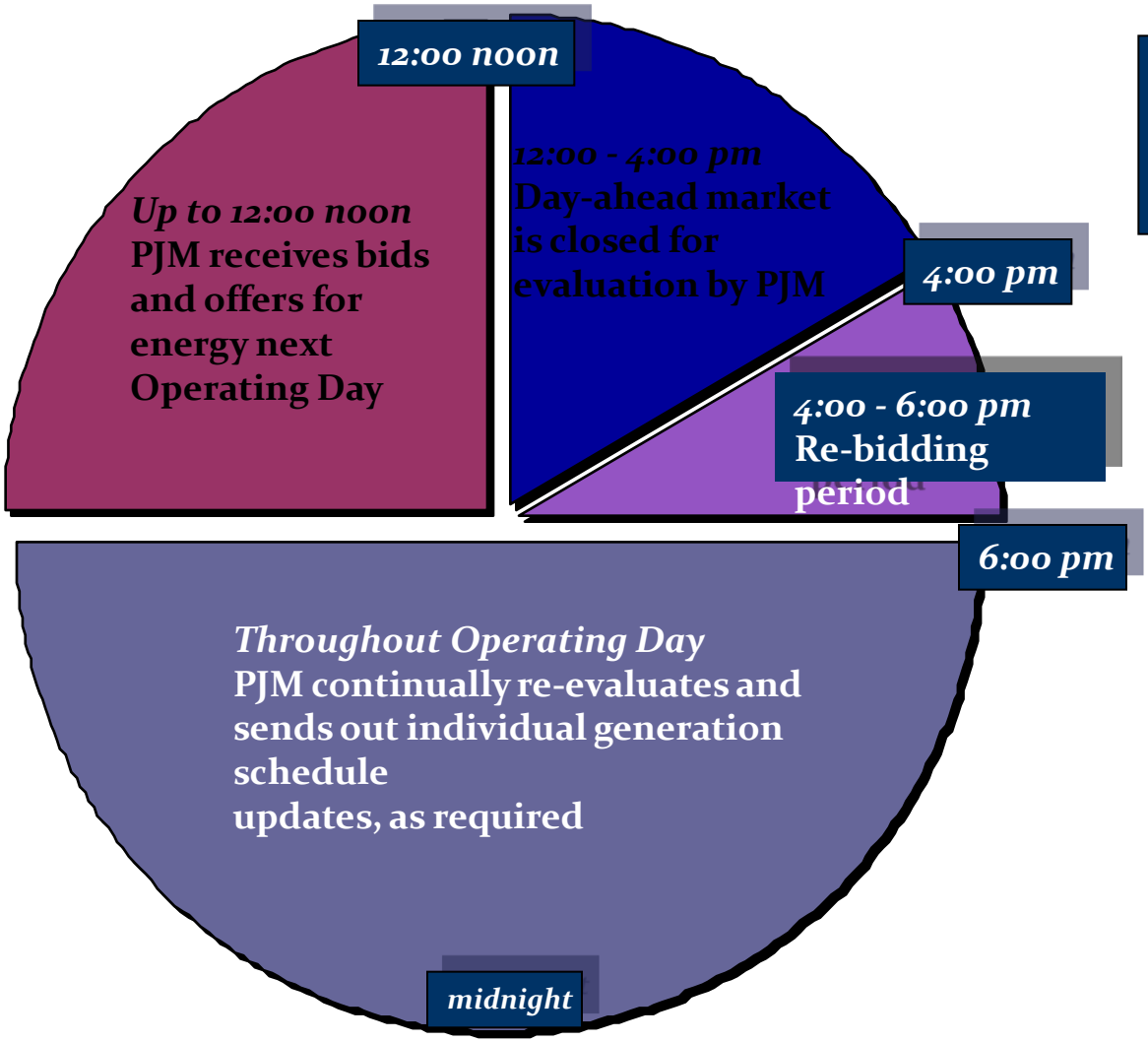
- Entitlements to Firm Transmission Service Customers to receive an allocation of the revenues from the Annual FTR Auction
- ARRs provide a revenue stream to the firm transmission customer to offset purchase price of FTRs
- ARRs are allocated annually

Two Settlement Markets

Forward markets for electric energy in PJM

- Day-ahead Market
  - Financial market using Bid-In Load
  - Prices calculated hourly
  - Settlements made hourly
  - Includes virtual bids and price sensitive demand
- Real-time Market
  - Physical Market based on actual system conditions
  - Prices calculated every 5 minutes
  - Hourly settlements based on deviations from Day-Ahead position

Day-Ahead Market Timeline



Ancillary Services

- Regulation Market
- Synchronized Reserve Market
- Black Start Service
- Reactive Services
- Scheduling, System Control & Dispatch

Regulation Market

Provide balance of generation and load

- Generation and Demand Response resources
- Transmission customer must provide or purchase
- RMCP = Regulation Market Clearing Price
- Regulation Price = Higher of RMCP or offer price plus opportunity cost

Scheduling, System Control & Dispatch

Provide transmission service and operate energy markets

- Control Area Administrative Service
- FTR Administrative Service
- Market Support Service
- Regulation Administrative Service
- Capacity Resource and Obligation Service

Blackstart Service

Provide balance of generation and load

- Transmission Owners and PJM identify critical Blackstart units
- Generator annual revenue requirements - Cost-based service
- Charges go to Transmission Customers
- Annual Blackstart testing requirements

Reactive Supply & Voltage Control

Maintain transmission voltages within acceptable limits

- FERC approves reactive revenue requirements
- PJM calculates zonal rate
- Paid by transmission customers
- Credits go to generation resources and transmission owners

Synchronized Reserves Market

Bring generation and load back in balance with a loss of generation

- Load Serving Entities have obligation to purchase based on Load Ratio Share
  - Bilateral
  - Schedule own resources
  - Purchase from Synchronized Reserve Market
- Co-optimized with Regulation Market
- Allows for participation by Demand Side Response resources

GAS WHOLESALE

History of Natural Gas Restructuring

Turn of the (20th) Century System

Vertically integrated industry – more localized

- Local production wells
- Short distance gathering/distribution lines
- End-user consumption in areas appurtenant to production

Late 1930s-1960s

- Natural Gas Act of 1938 established Federal Power Act authority over interstate natural gas sales by U.S. Congress, including wellhead prices
- Some natural gas assets split into interstate transmission (FERC) and intrastate (PUCO)
- Additional interstate (long-line) transmission built from Mid-continent and Gulf Coast to Midwest & Northeast
- Local distribution companies and interstate pipelines utilized bundled rates

History of Natural Gas Restructuring

1950s-1960s

- Significant demand growth fueled by access to new interstate pipelines and postwar economic growth

1970s

- Regulated wholesale pricing caused new production (supplies) to dwindle

Late 1970s – early 1980s

- U.S. Congress: Natural Gas Policy Act of 1978 – partial price decontrols at wellhead

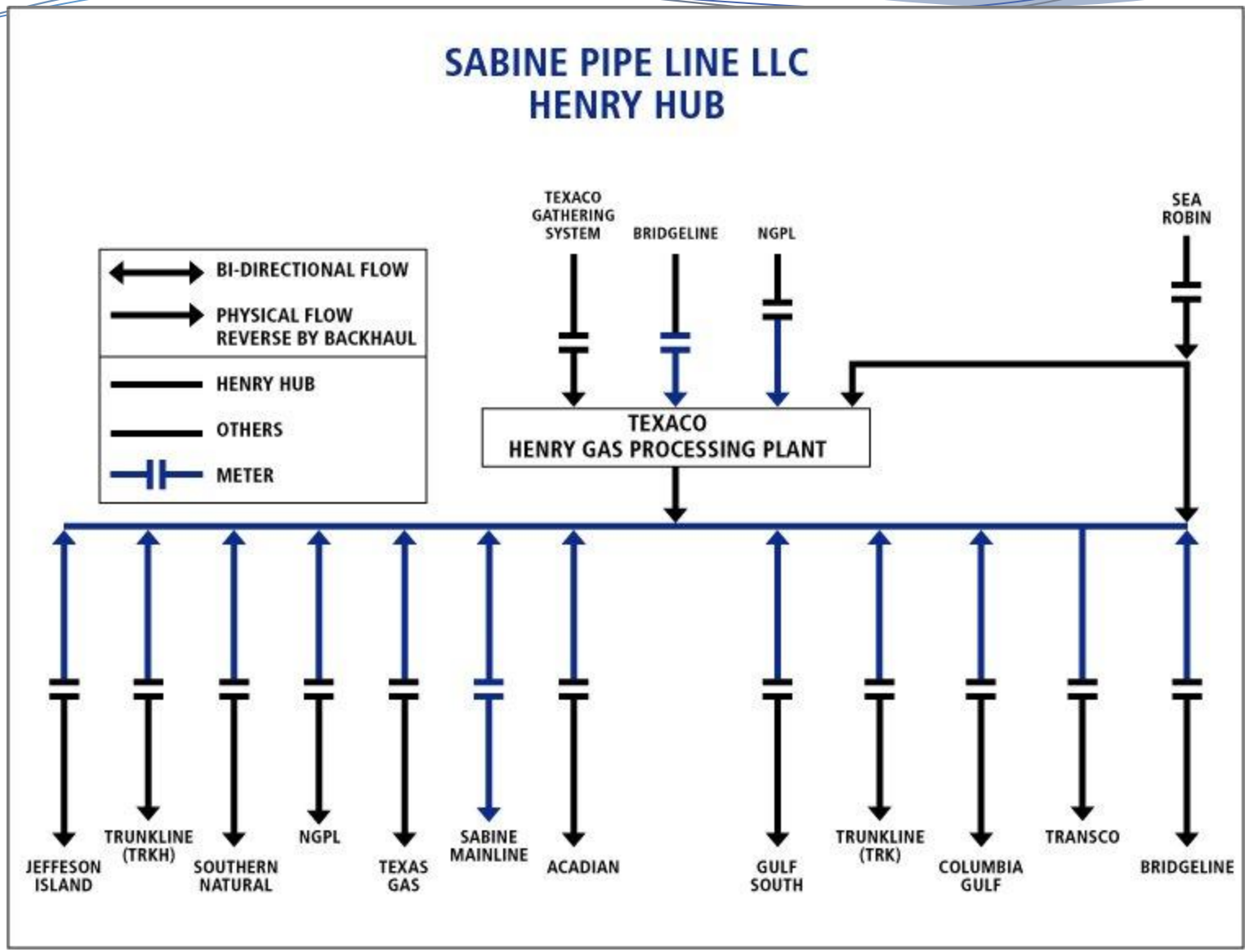
History of Natural Gas Restructuring

1980s

- Significant evolution away from regulated wellhead pricing
- Introduced competitive forces in interstate pipeline rates by unbundling those rates (commodity, capacity, and storage services were separated out)
- FERC Orders 436 & 500 implemented open access (shippers could purchase gas commodity from someone other than the pipeline)
- FERC Order 636 removed pipelines from merchant function (no longer could sell natural gas commodity)

1990s

- FERC strengthened codes of conduct for pipelines and their affiliates


SABINE PIPE LINE LLC
HENRY HUB
BI-DIRECTIONAL FLOW
PHYSICAL FLOW
REVERSE BY BACKHAUL
HENRY HUB
OTHERS
METER
TEXACO
GATHERING
SYSTEM
BRIDGELINE
NGPL
SEA
ROBIN
TEXACO
HENRY GAS PROCESSING PLANT
JEFFESON
ISLAND
TRUNKLINE
(TRKH)
SOUTHERN
NATURAL
NGPL
TEXAS
GAS
SABINE
MAINLINE
ACADIAN
GULF
SOUTH
TRUNKLINE
(TRK)
COLUMBIA
GULF
TRANSCO
BRIDGELINE

ELECTRIC RETAIL

State Jurisdiction - Retail

- Local Distribution monopoly
- Cost of service rate making for Distribution services
- Market tests
- Standard Service Offer
- Retail Auction Oversight
- Competitive Retail Service Supplier Certification
- Retail Market Monitoring

We also do:

- Wholesale market monitoring
- Generation Siting
- Transmission Siting

History of Electric Restructuring in Ohio

Senate Bill 3

A 1999 law effective January 2001 restructured Ohio's electric industry

- allowed customers to shop for electricity
- provided a five-year market development period

Turn of the Century System

- Unbundling of vertically integrated system
- Customers served by generator of choice
- Transmission and distribution remain regulated
- For generation, the rate of return system of regulation replaced by competition

State of Ohio Reforms

- **Unbundling of Rates**
  - Transmission (monopoly, FERC jurisdiction)
  - Distribution (monopoly, PUCO jurisdiction)
  - Generation (deregulated, market based)
- **Customer Choice**
  - Competitive Retail Electric Services
  - Aggregation of Customers
  - Supplier Tariffs

Dos and Don'ts

Regional Transmission Organization

- Operation of the assets
- Maintenance scheduling and coordination
- Match load and generation
- Non-profit

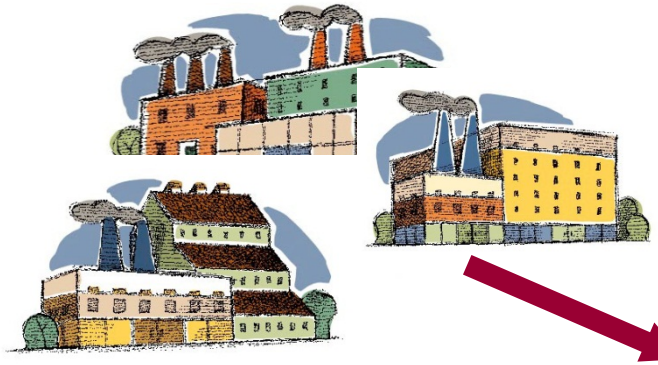
Local Utility

- Owns assets
- Performs maintenance
- Directly serves end use customers
- Publicly traded company

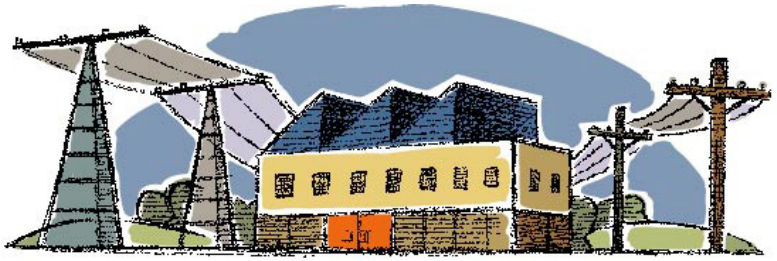
Issues Under Restructuring

- Unbundling
- Market Power
- Transitional Issues
- Independent System Operation
- Social Issues
- Environmental Issues
- Taxes

Unbundling



Generation (“or supply”)
Shop for this

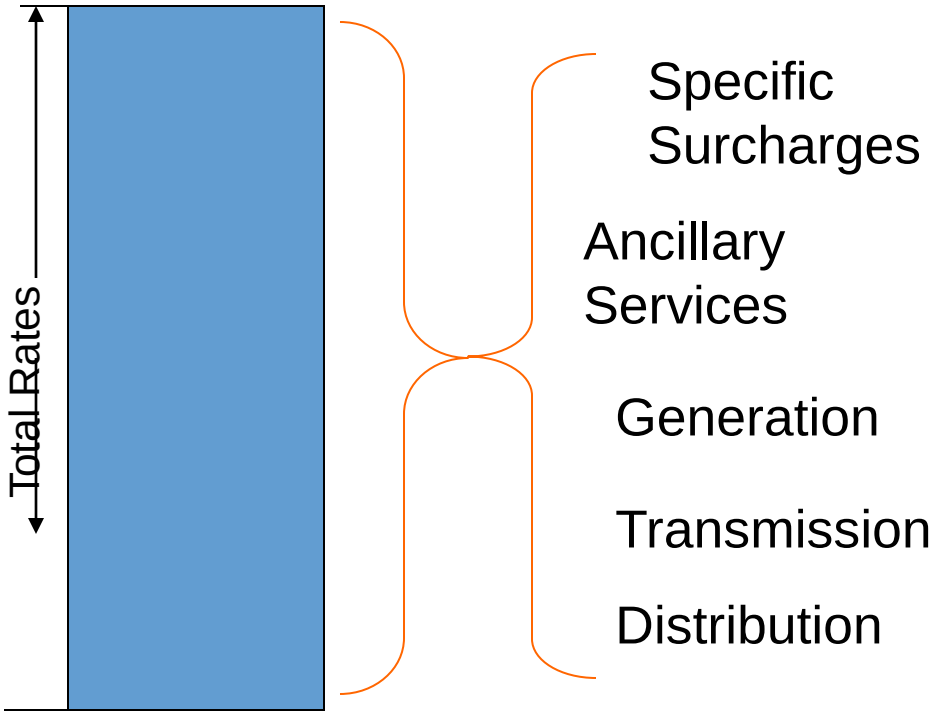


Transmission
Remains regulated by FERC

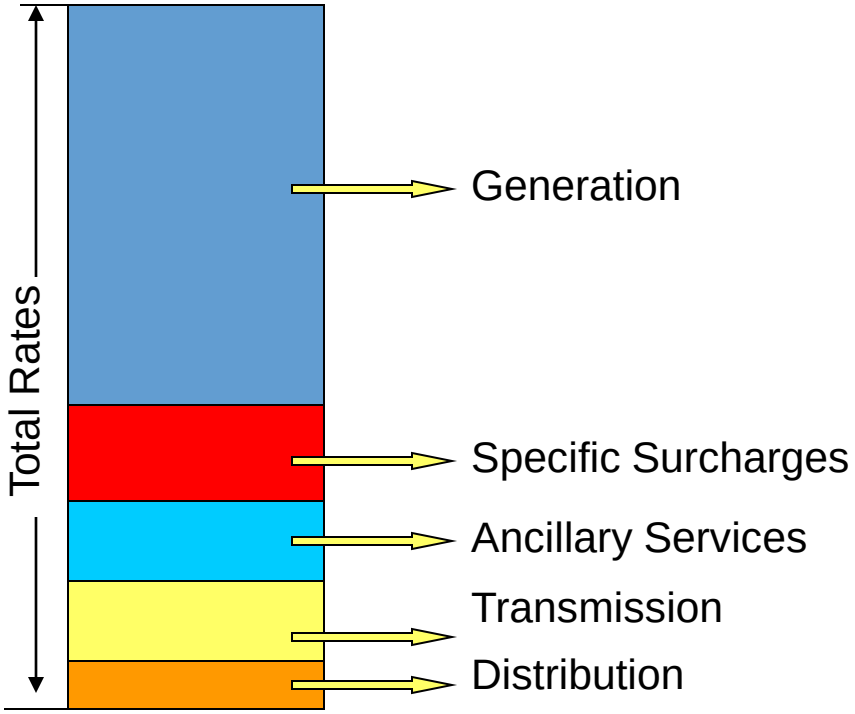
Distribution
Remains regulated by PUCO and provided by your local utility

“Bundled” Rates

- Rates were previously a “bundle” of costs for different services.
  - Generation
  - Transmission
  - Distribution
  - Ancillary Services
  - Specific Surcharges



“Unbundled” Rates



Electric Restructuring would “unbundle” the rates so the generation component could be shopped for, and priced at “market.” The bill anticipated that market rates would be lower than regulated rates.

Transitional Issues

Temporary issues pertaining only to the period of transition from a regulated to a competitive industry.

Timing

How soon full competition can begin

Stranded Costs

Production

Regulatory

Social Issues

Universal Service

Provider of Last Resort

Low Income Programs

Consumer Education

Metering & Billing

Unfair & Deceptive Practices

Focus Regulatory Shift to Market Monitoring & Development

The ability to control prices and product quality

Vertical

A vertically integrated company favors its own or an affiliates generation over alternatives through non-price barriers.

A single supplier or group of suppliers has a strategic advantage in terms of access to customers relative to other suppliers.

Horizontal

A single supplier or group of suppliers has undue influence on the price of the product due to concentration of market share that can be used strategically.

Market Development Period

What did it look like?

- 5 year market development period during which time rates are frozen
- Local utility delivers electricity and maintains infrastructure
- Utility is default supplier

What happened then?

- Early results early showed significant "switching" in some high cost service territories while the moderate-to-low priced utilities experienced limited customer switching
- Governmental aggregation was a success story
- A fully competitive market had not developed as quickly as envisioned by lawmakers

PLUS…

Many other things happened during the 5-year Market Development Period

- The California crisis and Enron scandals
- Extreme volatility and upward movement of market prices (due to rising gas prices, rising coal prices, and construction facilities not matching the projected increases in demand)
- And the slower than expected development of Independent System Operators for the transmission systems

Rate Stabilization Plans

- As the end of the market development period neared, there were a limited number of competitive electric suppliers and low degree of market activity. Therefore, there was concern that an immediate shift to market-based rates in 2006 would not be in the best interest of customers
- To avoid rate "sticker shock" and gradually transition customers to market-based rates, the PUCO worked with Ohio's electric utilities and stakeholders to develop Rate Stabilization Plans (RSPs).
- Most Rate Stabilization Plans lasted through 2008

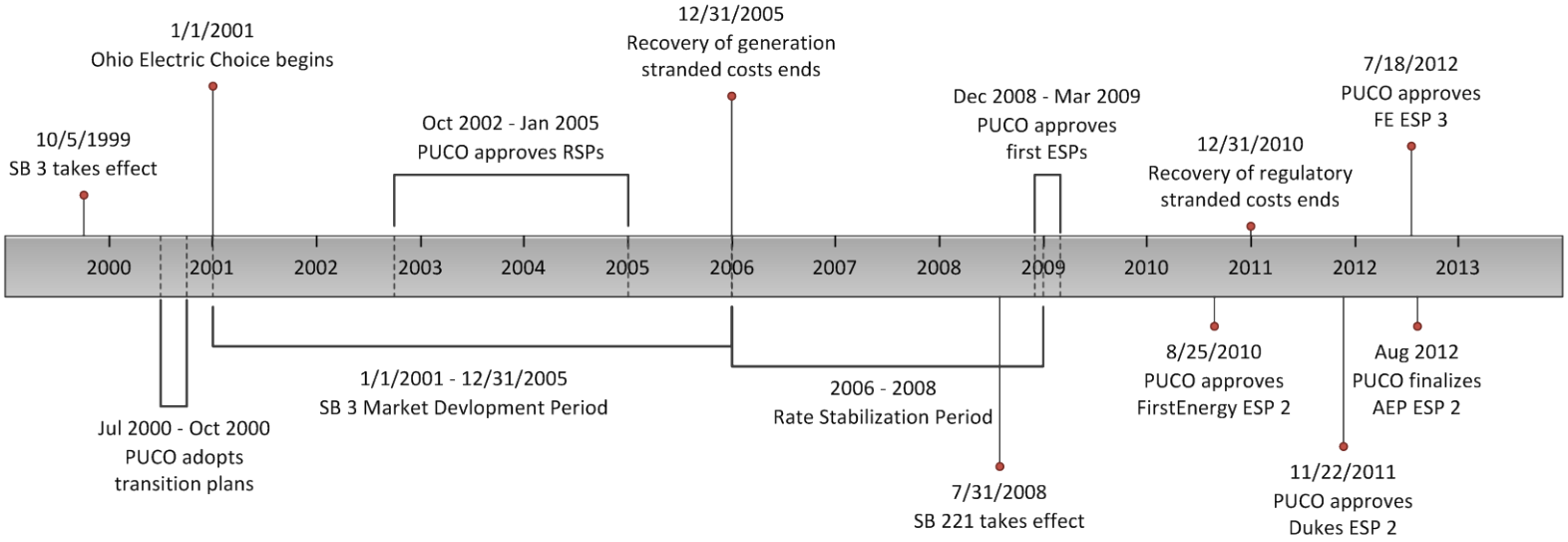
"Energy, Jobs and Progress Plan

Middle-ground Approach to Electricity Regulation

- Evidence demonstrated few competitive options existed at the retail level
- Did not close the door on market pricing, but required a demonstration that competition is effective
- Action was necessary to secure Ohio's energy future
- PUCO can set rates and allow utilities to recoup the cost for new generation and modernization of the electric system
- The plan was a comprehensive, long-term approach to the challenges of supplying reliable and affordable power
- It also had to address the approaching expiration of the Rate Stabilization Plans
- Attract energy jobs of the future through an Ohio advanced energy portfolio standard
- Ensure affordable and stable energy prices to protect Ohio consumers and existing Ohio jobs

Ohio Public Utilities Commission

Electric Restructuring Timeline



Retail Markets

- Two Offerings:
  - Standard Service Offer (SSO) is the default option
  - Competitive Retail Electric Supplier (CRES) competitive alternative to standard service

- Both retail constructs are derived from the wholesale market

- **Standard Service Offer (SSO)**
  - Default service for non-shopping customers
  - Price based upon the results of competitive procurement auctions
- **Competitive Retail Electric Supplier (CRES)**
  - Independent marketers certified by Commission
  - Compete to attract customers from SSO
  - Flat-price offers for mass-market customers
  - Specific offers to larger commercial and industrial customers based on their unique energy needs (load profile) and cost of service
  - May own generation (or be affiliate)
  - May source energy from wholesale market

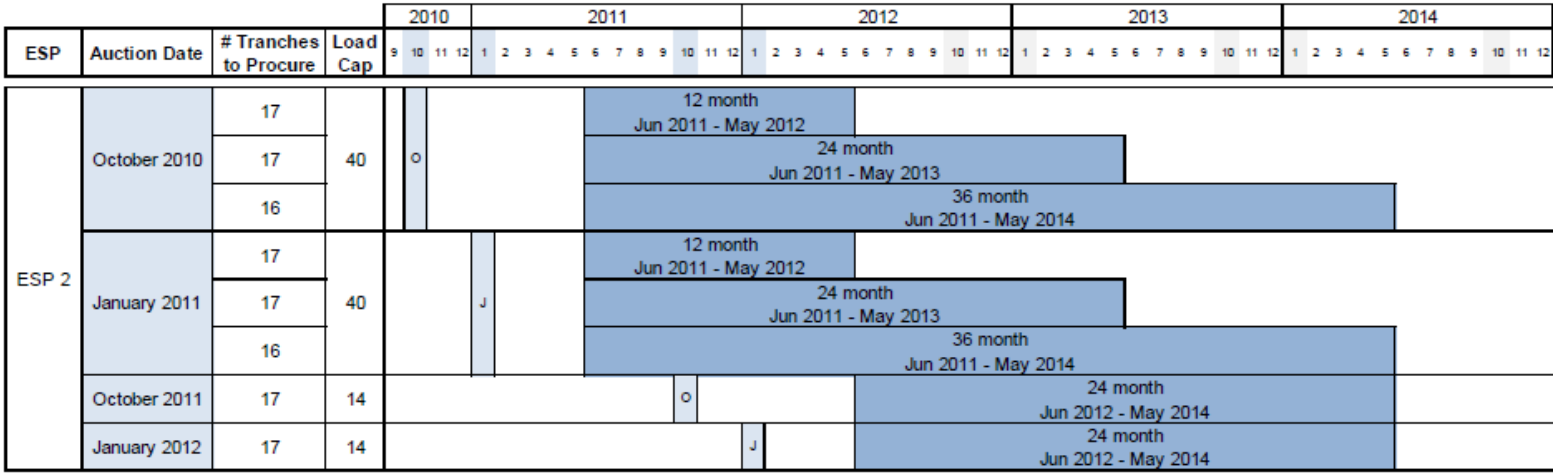
- **Standard Service Offer (SSO) Auctions**
  - Suppliers compete for right to serve default load
  - Master Supply Agreement governs bidder requirements and product definition
  - Independent auction administrator
  - Bidders may own generation or obtain energy and capacity through wholesale market

- **SSO Load** is divided into identical units called "tranches"
  - Each tranche represents one percent (1%) of the actual hourly energy required for SSO load for the applicable delivery period as well as one percent (1%) of the PJM capacity requirement
  - No bidder may win more tranches than the load cap
  - The PUCO has ordered a load cap of 80%

- Example of a Declining Clock Auction

Illustrative Bidding in the Clock Phase							
Round	Tranche Target	Announced Price ($/MWh)	Number of Tranches Bid				
			BidderA	BidderB	BidderC	BidderD	Total
1	100	$75.00	34	55	21	72	182
2	100	$70.00	30	55	15	50	150
3	100	$66.00	20	52	10	45	127
4	100	$62.00	15	48	0	44	107
5	**100**	**$59.50**	**0**	**48**	**—**	**42**	**90**

Multiple solicitations of various durations are blended together to mitigate wholesale price volatility



Standard Service Offer (SSO) Auctions

- If there are more tranches bid than the number of tranches needed at the current round price, the price for a product ticks down for the next round

- After each round a bidder may be able to:
  - Withdraw some tranches
  - Switch bids between products
  - Both withdraw and switch

- Auction ends when number of bids = tranche target
  - Sealed Bid Round for final true-up

Standard Service Offer (SSO) Auctions

- Full Requirements Service
  - Suppliers bid to provide energy, capacity, transmission service, ancillary transmission service
- Retail rates will be developed directly from the final prices
- Reconciliation mechanism ensures the distribution utility neither makes nor loses money related to the provision of SSO Generation Service

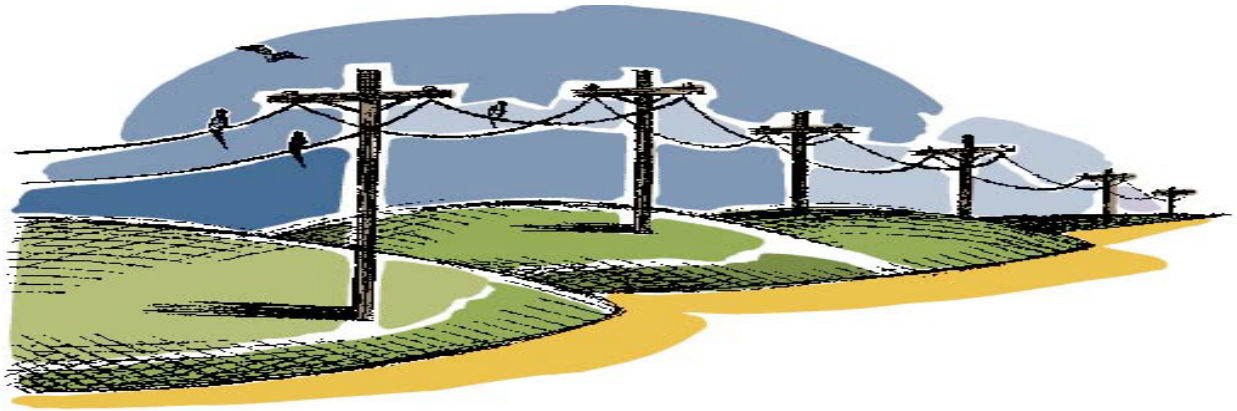
Where We are Today

- Wholesale Markets
  - Regional Transmission Operators
  - Capacity and Energy Auctions

- Retail Markets
  - Corporate Separation
  - Competitive Retail Suppliers
  - Default Service Auctions

Things that haven't changed:

- Same safe, reliable service
- Local utility still delivers the electricity
- Local utility still maintains the poles and wires
- Still call your local utility in case of a power outage
- Still get service even if choose not to change
- Low income programs continue



Summary of Switch Rates from EDUs to CRES Providers in Terms of Sales
For the Month Ending March 31, 2012
(MWh)

Provider Name	EDU Service Area	Quarter Ending	Year	Residential Sales	Commercial Sales	Industrial Sales	Total Sales
Cleveland Electric Illuminating Company	CEI	31-Mar	2012	114116	61685	57859	235119
CRES Providers	CEI	31-Mar	2012	362315	479455	456962	1298733
Total Sales	CEI	31-Mar	2012	476431	541140	514821	1533852
EDU Share	CEI	31-Mar	2012	23.95%	11.40%	11.24%	15.33%
Electric Choice Sales Switch Rates	**CEI**	**31-Mar**	**2012**	**76.05%**	**88.60%**	**88.76%**	**84.67%**

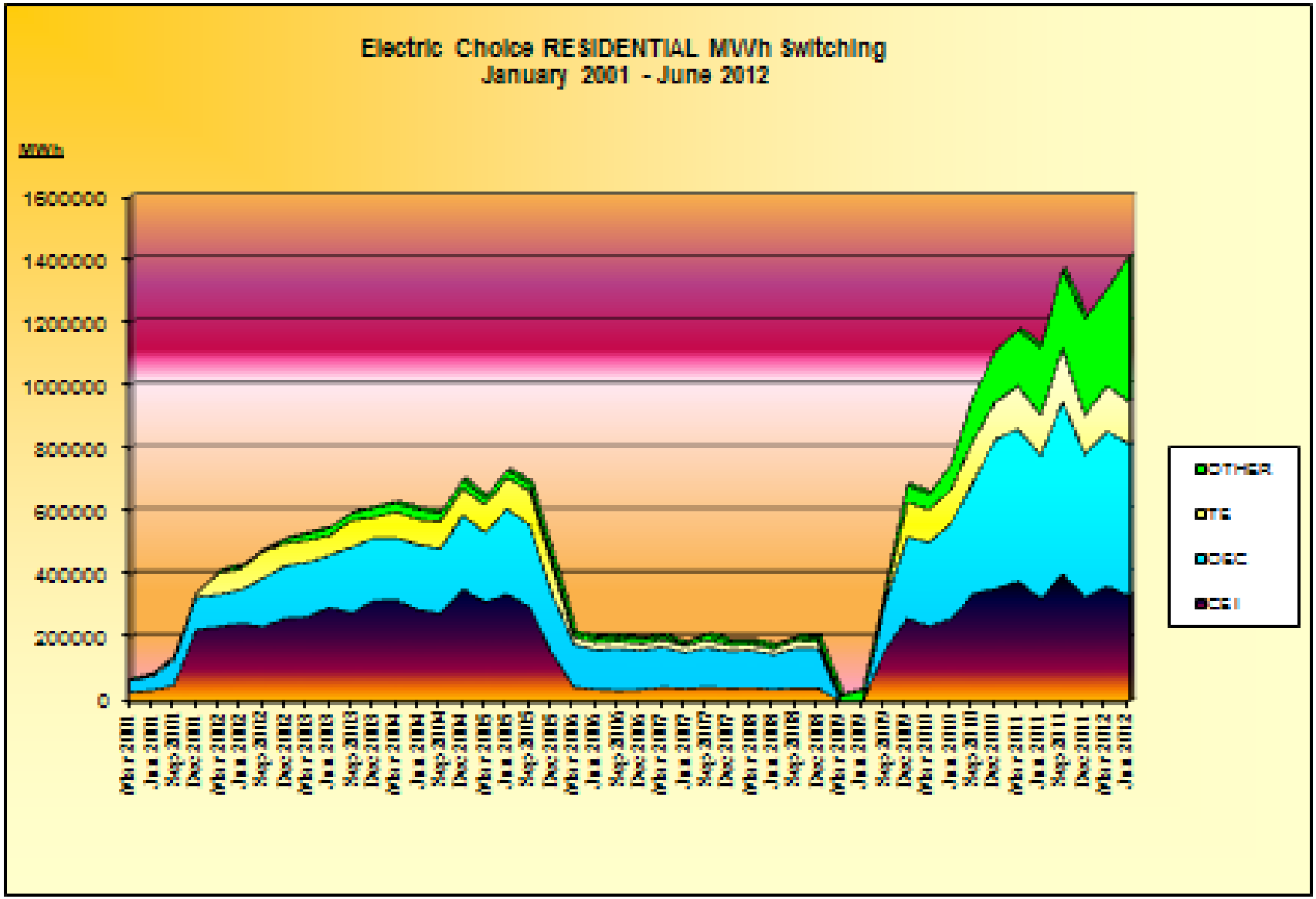
Provider Name	EDU Service Area	Quarter Ending	Year	Residential Sales	Commercial Sales	Industrial Sales	Total Sales
Duke Energy Ohio	DUKE	31-Mar	2012	371024	102836	31480	527704
CRES Providers	DUKE	31-Mar	2012	162231	373479	386475	1009737
Total Sales	DUKE	31-Mar	2012	533255	476315	417955	1537441
EDU Share	DUKE	31-Mar	2012	69.58%	21.59%	7.53%	34.32%
Electric Choice Sales Switch Rates	**DUKE**	**31-Mar**	**2012**	**30.42%**	**78.41%**	**92.47%**	**65.68%**

Provider Name	EDU Service Area	Quarter Ending	Year	Residential Sales	Commercial Sales	Industrial Sales	Total Sales
AEP - Ohio	AEP	31-Mar	2012	1073252	634987	1125352	2842983
CRES Providers	AEP	31-Mar	2012	86288	433570	462244	983184
Total Sales	AEP	31-Mar	2012	1159540	1068557	1587596	3826167
EDU Share	AEP	31-Mar	2012	92.558%	59.425%	70.884%	74.304%
Electric Choice Sales Switch Rates	**AEP**	**31-Mar**	**2012**	**7.442%**	**40.575%**	**29.116%**	**25.696%**

Provider Name	EDU Service Area	Quarter Ending	Year	Residential Sales	Commercial Sales	Industrial Sales	Total Sales
The Dayton Power and Light Company	DPL	31-Mar	2012	377191	85953	19841	528239
CRES Providers	DPL	31-Mar	2012	59787	199274	281097	604212
Total Sales	DPL	31-Mar	2012	436978	285227	300938	1132451
EDU Share	DPL	31-Mar	2012	86.32%	30.13%	6.59%	46.65%
Electric Choice Sales Switch Rates	**DPL**	**31-Mar**	**2012**	**13.68%**	**69.87%**	**93.41%**	**53.35%**

Source: PUCO, Energy & Environment
Note1: Total sales includes residential, commercial, industrial and other sales.
Note2: The switch rate calculation is intended to present the broadest possible picture of the state of retail electric competition in Ohio. Appropriate calculations made for other purposes may be based on different data, and may yield different results.
Note3: "Total Sales" include "Other Sales" (e.g. street lighting).
Note4: CSP and OP has merged into AEP-Ohio
*****UPDATED**

Electric CHOICE Switching Rate Report


Electric Choice RESIDENTIAL MWh Switching
January 2001 - June 2012
MWh
16000000
14000000
12000000
10000000
8000000
6000000
4000000
2000000
0
OTHER
DTE
DP&L
CEI

Governmental Aggregation: the power of group buying

Ohio Electric Choice allowed for local governments to join all of the customers in a community into a single buying group.

- Most cases "opt-out" is used
- Community passes a ballot issue
- Everyone in community *automatically* enrolled and a supplier is chosen for the group
- Everyone given a chance to "opt-out" or say you don't want to participate

GAS RETAIL

History of Natural Gas Restructuring in Ohio

Turn of the (20th) Century System

Vertically integrated industry – more localized

- Local production wells
- Short distance gathering/distribution lines
- End-user consumption in areas appurtenant to production

1970s

Regulated wholesale pricing caused new production (supplies) to dwindle

- Winters 1976-1977 and 1977-1978 saw significant sustained cold weather in Midwest & Great Lakes
  - Natural gas curtailments due to lack of supplies
  - Schools & businesses closed for days to weeks

History of Natural Gas Restructuring in Ohio

Late 1970s – early 1980s

Ohio's "Self-Help" program

- LDCs in the state interconnected delivering Ohio production across their systems
- Kept gas off interstate systems; therefore not subject to FERC authority
- General Motors (GM) owned production in eastern part of Ohio sought ability to transport gas across multiple LDCs for delivery to their production facilities in northern and western Ohio

1980s

- Docket No. 85-800-GA-COI implemented LDC open access for very large volume customers (major industrial customers)
- By late 1980s, PUCO kept revising downward the volume threshold to be able to transport gas (allowed mid-sized commercial & industrials to utilize)

History of Natural Gas Restructuring in Ohio

1990s

Ohio LDCs began allowing residential customers to select their own suppliers of commodity

- LDC continued to deliver the gas
- Marketers provided the commodity
- Began with pilot programs in certain areas before full implementation

Natural Gas Legislation

- In 1996, the Natural Gas Alternative Regulation Law, House Bill (HB) 476 was passed. It established customer choice as a State policy goal.
- The natural gas industry was “unbundled” or deregulated in 2001 as a result of amended substitute House Bill (HB)9.
- Unbundling is the process of separating the charges for natural gas delivery and the actual gas itself, allowing consumers to order their gas from another supplier.

Natural Gas Legislation

- The major provisions of House Bill (HB) 9 required that:
  - retail gas suppliers to be certified by PUCO
  - authorizes governmental aggregation for competitive retail gas service
  - authorizes the PUCO to order open access for large LDCs
  - consolidates consumer protection authority over certain retail natural gas transactions

Natural Gas

- A pilot program was begun in 1997 that allowed consumers to “choose” an alternate supplier for their natural gas.
- All four LDC’s had CHOICE programs by 2003.
- As Energy Choice programs grew, parties recognized that the GCR mechanism did not send proper price signals.
- In 2006, in Case No. 05-474-GA-EXM the PUCO approved a company’s application to began Phase I of the “Exit of the Merchant Function”.

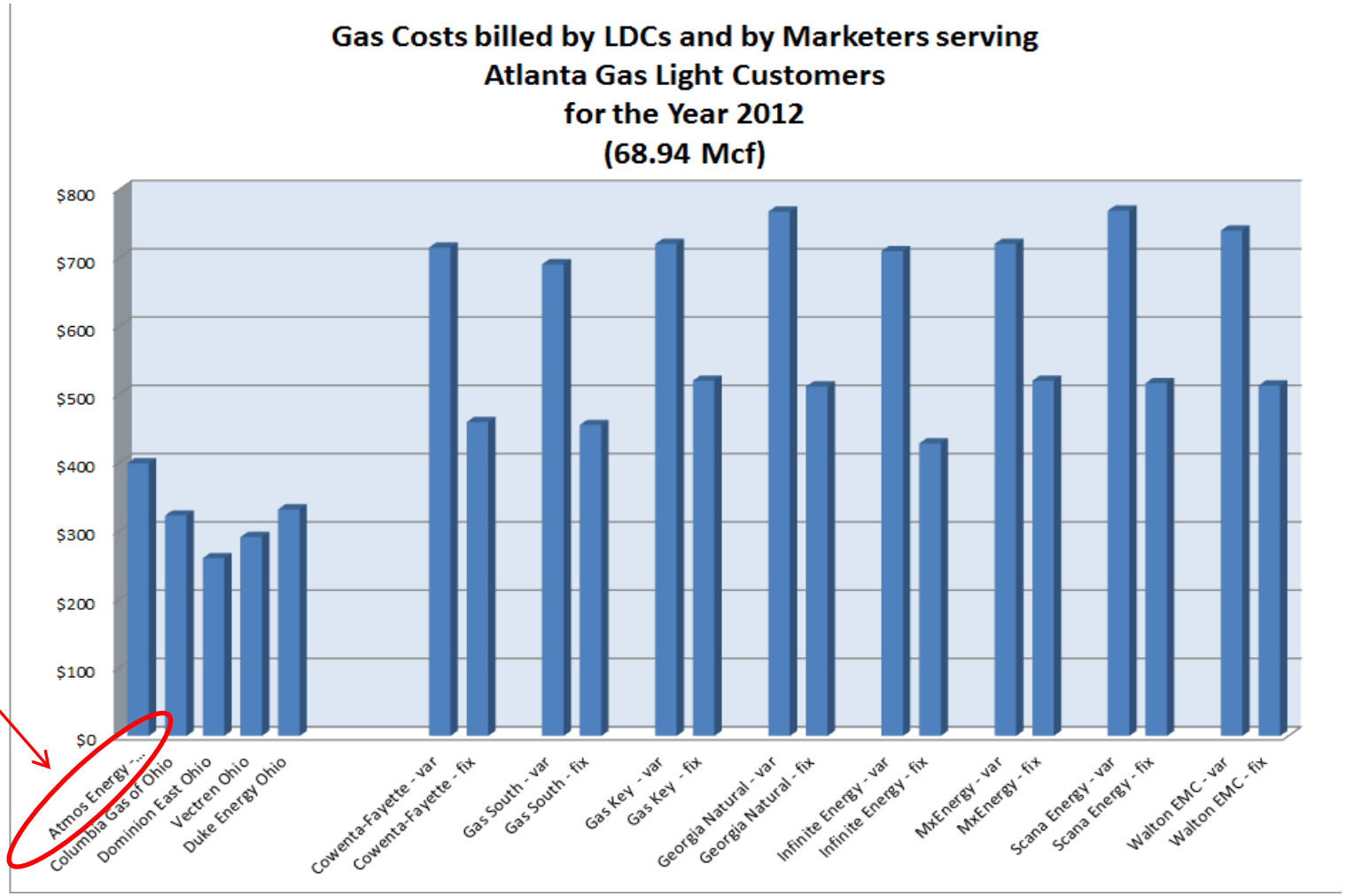
Natural Gas

- This "Phase I" replaced the Gas Cost Recovery (GCR) rate with a market based rate, called the Standard Service Offer (SSO).
  - An auction awards the winning suppliers the right to supply the distribution company's SSO natural gas supply.
  - The winning rate is called the Retail Price adjustment (RPA).
  - The PUCO approves that auction rate.
  - The SSO Rate is based on NYMEX month-end settlement price plus the RPA auction result.
  - SSO rate varies monthly, same as the GCR rate

Commodity Market Transformation

- In an SSO auction, wholesale supply volume, not actual customers, is bid out
  - Market to be supplied is divided into slices (tranches)
  - Maximum share per supplier is for one-third of total available
  - Bidders are pre-approved for creditworthiness
- Standard Choice Offer (SCO) auction in which the retail supply obligation for Choice-eligible customers is bid out
  - Promotes a direct retail relationship between customer and supplier
  - Same general process as SSO, i.e., market divided into tranches, one-third share maximum, credit pre-approval, etc.
  - Bidders must be certified to provide Energy Choice service
  - Supplier name and contact info appears on the bill

Amos Energy is the LDC next to Atlanta Gas Light



A highly competitive Provider of Last Resort (or SSO), as opposed to allowing customers to be assigned out to marketers (as happened in Atlanta Gas Light) will help discipline prices.

Ohio Today

- Large Ohio LDCs transitioning to exit the merchant function altogether
- Supplier of last resort function is bid out to alternative suppliers through a descending clock auction process (lowest qualified bidder)
- Guarantees against defaults by all suppliers

Natural Gas Customer Choice Programs in Ohio

Customer Enrollment Levels

As of March, 2012

Residential Customer Enrollment

Customer Choice Program		Residential Customers CHOICE	SCO	Eligible	Residential Percent Enrolled
Columbia Gas of Ohio		488,850	730,954	1,225,320	99.5%
Duke Energy of Ohio		114,193	-	369,747	30.9%
Dominion East Ohio Gas	***	965,748	-	1,002,856	96.3%
Vectren Energy Delivery of Ohio		120,903	142,617	266,009	99.1%

Commercial / Industrial Customer Enrollment

Customer Choice Program		Commercial / Industrial Customers CHOICE	SCO	Eligible	Commercial Percent Enrolled
Columbia Gas of Ohio		54,692	51,873	109,696	97.1%
Duke Energy of Ohio		14,121	-	29,917	47.2%
Dominion East Ohio Gas	***	80,015	-	82,570	96.9%
Vectren Energy Delivery of Ohio		10,814	12,826	23,672	99.9%

Total Customer Enrollment

Customer Choice Program		Total Customers CHOICE	SCO	Eligible	Total Percent Enrolled
Columbia Gas of Ohio		543,542	782,827	1,335,016	99.4%
Duke Energy of Ohio		128,314	-	399,664	32.1%
Dominion East Ohio Gas	***	1,045,763	-	1,085,426	96.3%
Vectren Energy Delivery of Ohio		131,717	155,443	289,681	99.1%

Note: Customers who qualify for PIPP are not included in the above numbers.
*** Includes both CHOICE and SCO (Standard Choice Offer) customers

Natural Gas CHOICE Switch Rates

THANK YOU!