

# Overview of Demand Response PJM

Integrations completed as of May 1<sup>st</sup>, 2005

## PJM Mid-Atlantic

### Current PJM RTO Statistics

Generating Units	1,200 +
Generation Capacity	165,000 MW
Peak Load	144,644 MW
Transmission Miles	56,070
Area (Square Miles)	164,250
Members	500 +
Population Served	51 Million
Area Served	13 States and DC

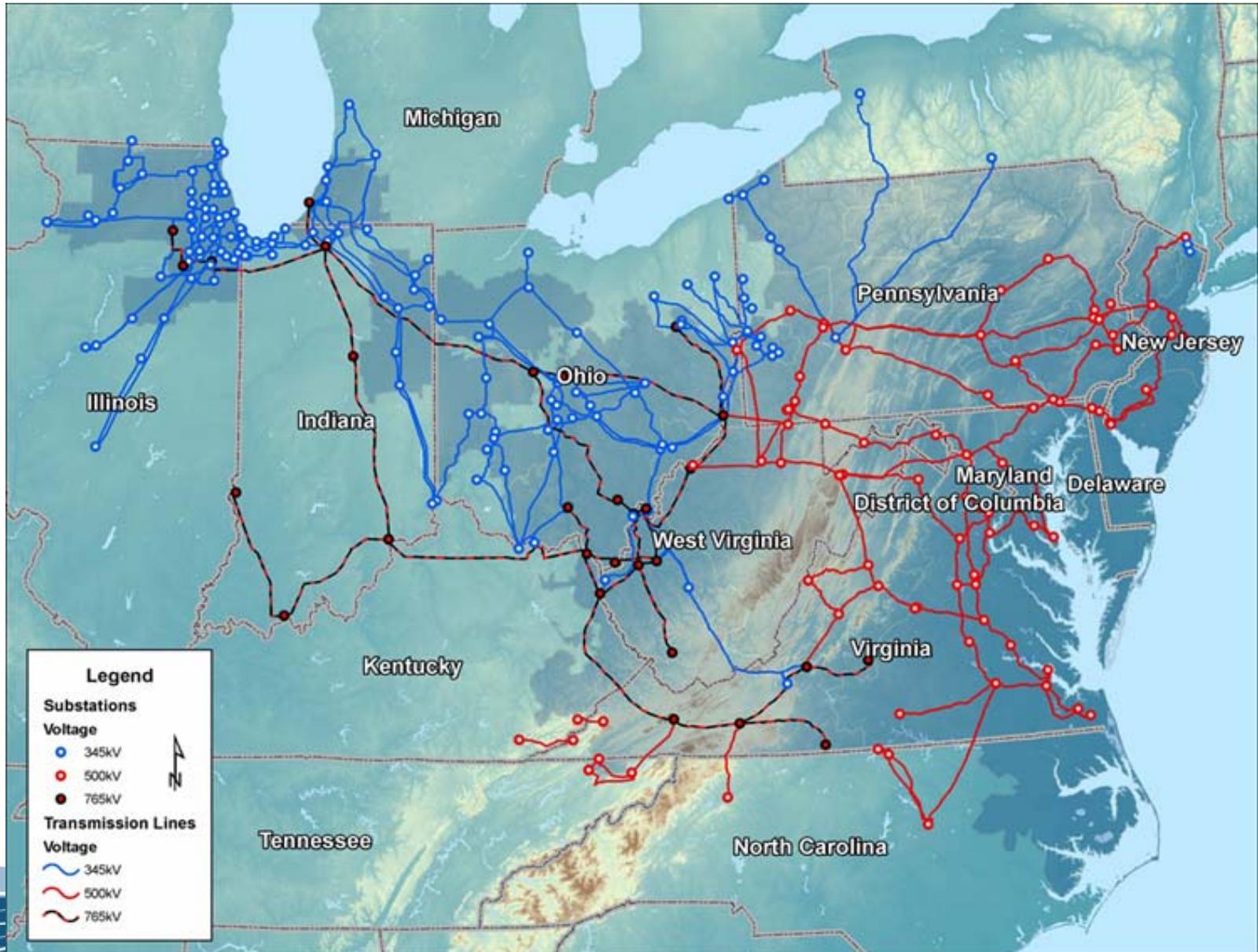
AEP, Dayton, ComEd, & DUQ

Dominion

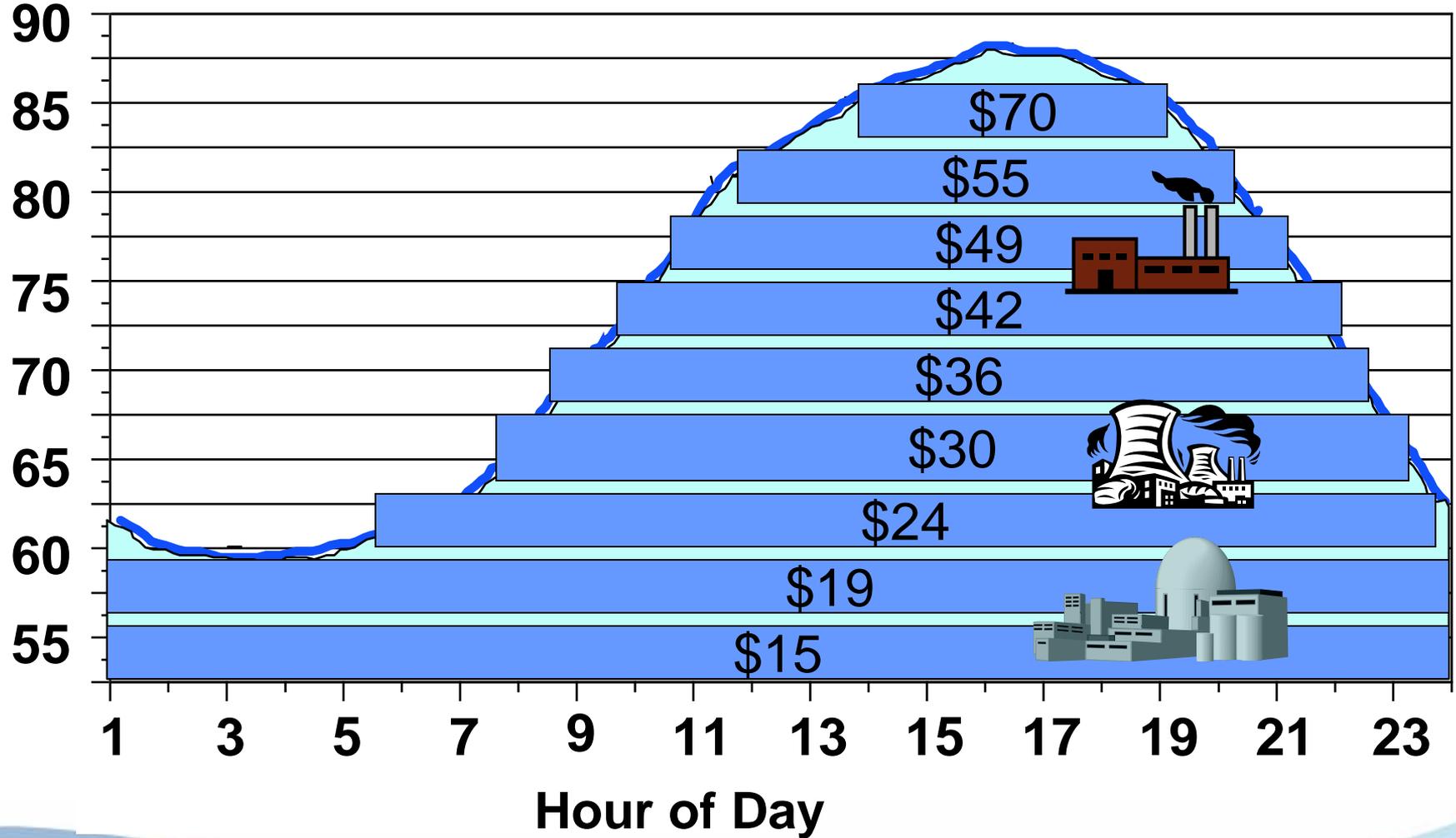
## How is PJM Different Than My Local Utility?

- PJM does not own any transmission or generation assets
- PJM does not take ownership of the energy on the system
- PJM is not responsible for the actual maintenance on generators or transmission systems (PJM coordinates maintenance)
- PJM does not directly serve any end use (retail) customers

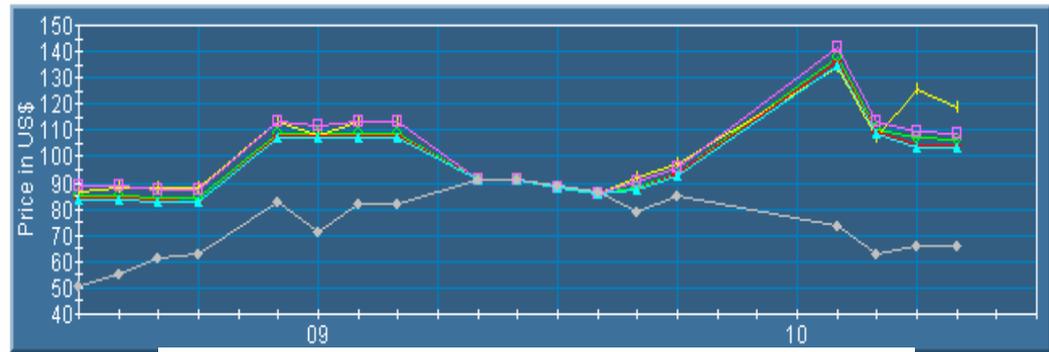
- PJM maintains the “big picture” of the transmission system regardless of ownership
- PJM by agreement has operational control of the transmission system
- PJM is operated as “profit neutral”
- PJM is not a publicly traded company
- PJM remains totally independent of all PJM members



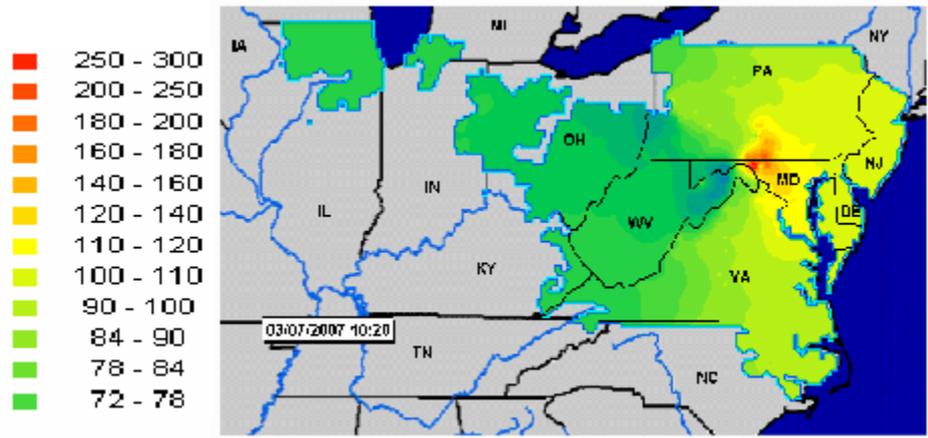
Load (MW x 1000)



- Day-Ahead Energy Market
- Real-Time Energy Market
- Reliability Pricing Model
  - Capacity construct effective June 2007
- Financial Transmission Rights
  - Auction Options
- Ancillary Services Markets
  - Regulation Market
  - Synchronized Reserve Market
  - Day Ahead Scheduling Reserve Market
  - Black Start Services
  - Reactive Services

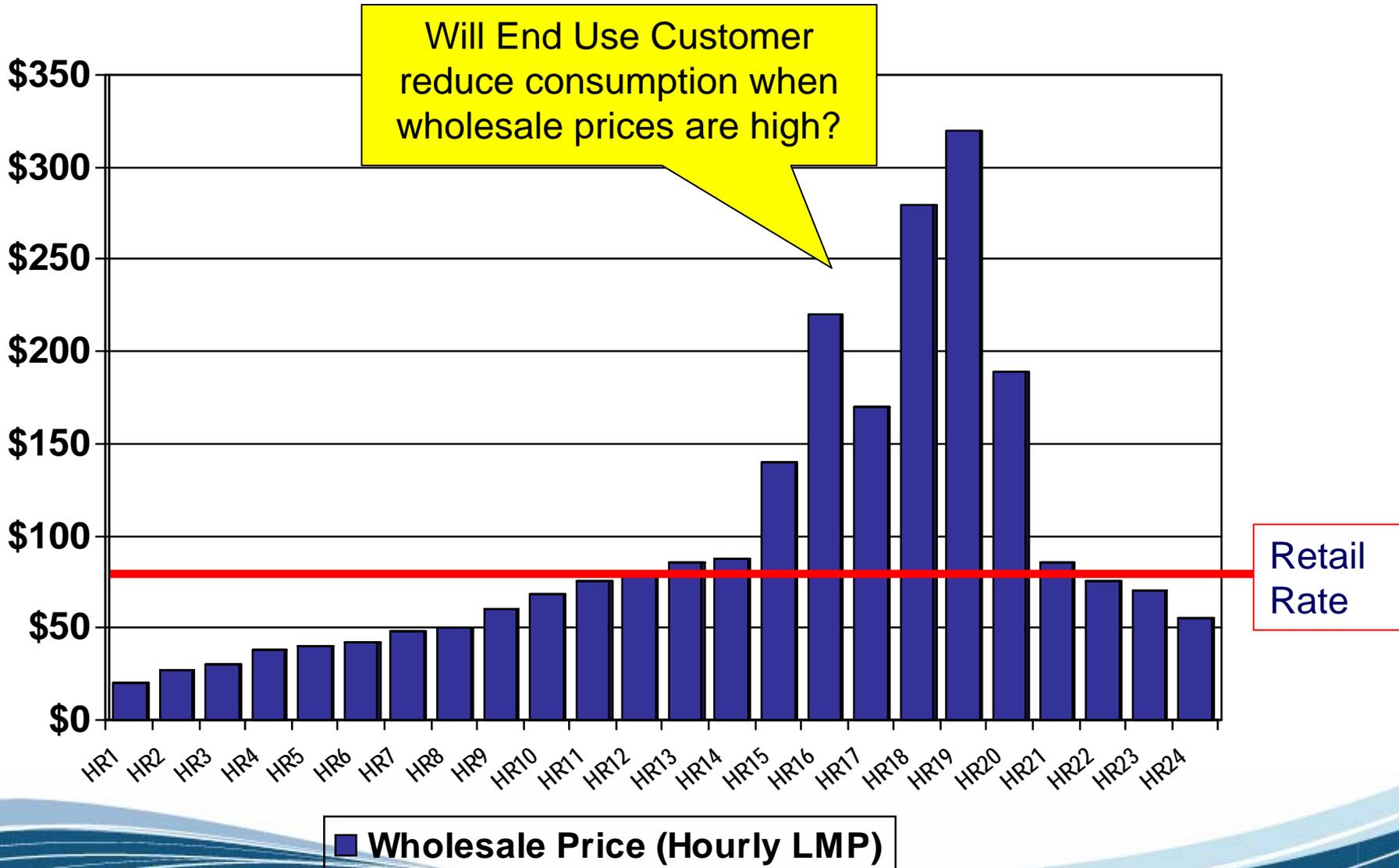


	LMP	Cur	Avg	Min	Max
AE (Zone)		106.4	98.55	83.96	137.4
JC (Zone)		104.2	97.62	83.03	136.0
PS (Zone)		103.4	97.16	82.62	134.8



# PJM

## Demand Side Response



## EMERGENCY

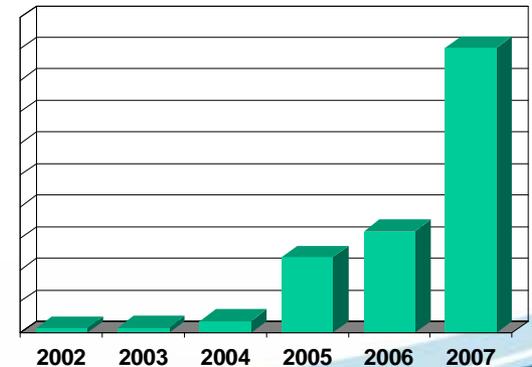
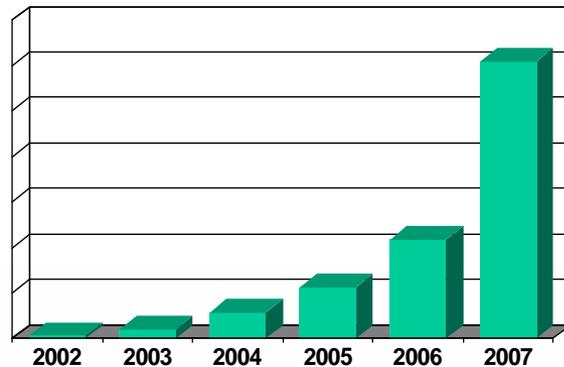
Designed to provide a method by which end-use customers may be compensated by PJM for reducing load during an emergency event.

## ECONOMIC

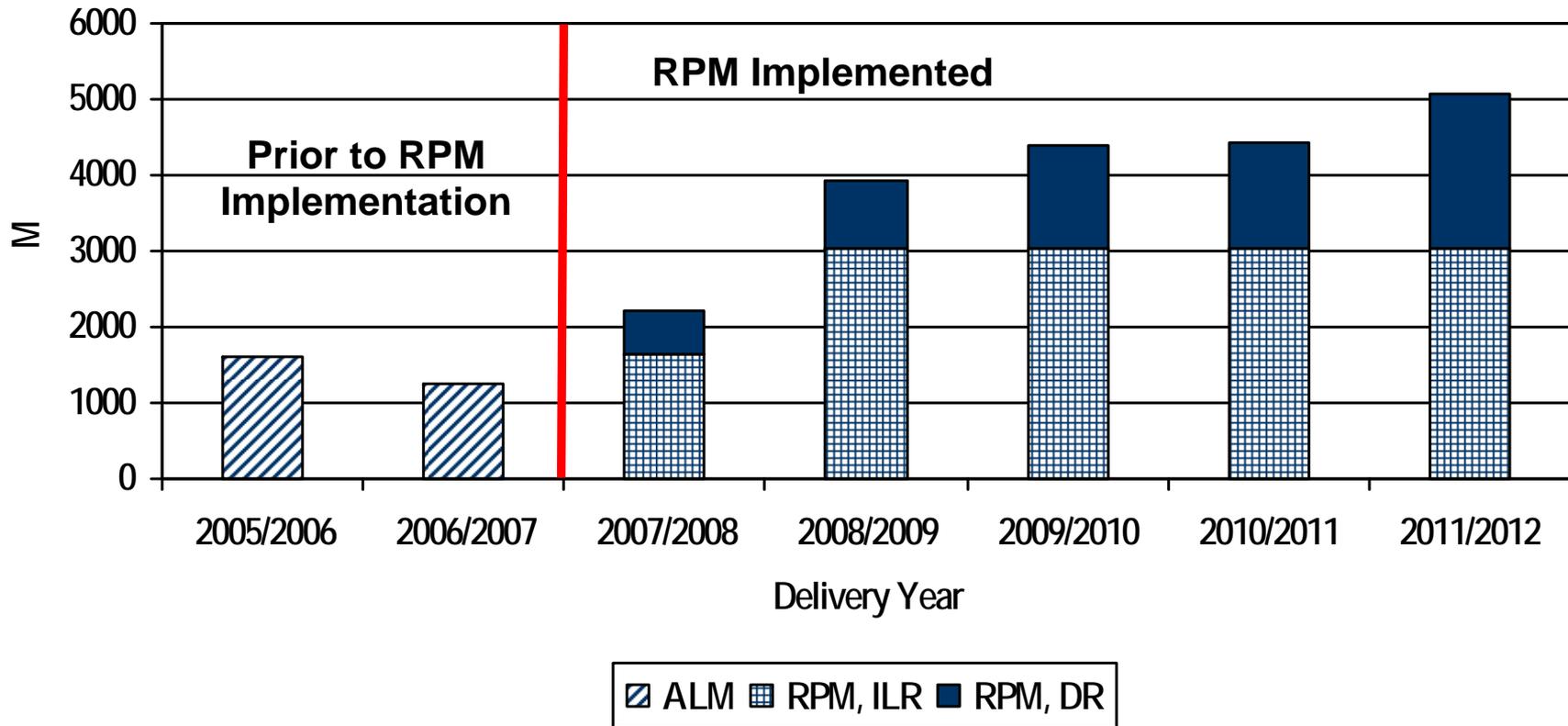
Designed to provide an incentive to customers or curtailment service providers to reduce consumption when PJM LMP prices are high.

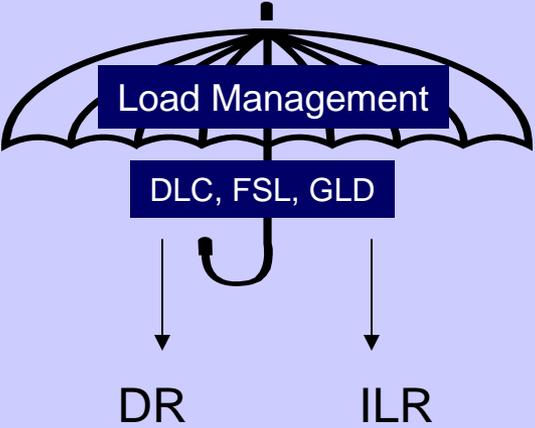
***Demand Side Response (DSR) = Load Response***

	Total MWh	Total Payments
2002	6,727	\$801,119
2003	19,518	\$833,530
2004	58,352	\$1,917,202
2005	113,393	\$12,000,354
2006	217,056	\$16,118,042
2007	608,745	\$45,173,237



# Participation Growth – Emergency (Capacity)



Energy	Capacity	Ancillary Services
<ul style="list-style-type: none"> <li>• Economic</li> <li>• Emergency – Energy Only</li> </ul> <p>Voluntary load reductions for <u>energy</u>, even during a PJM emergency event</p>	<ul style="list-style-type: none"> <li>• Emergency – Capacity Only</li> <li>• Emergency – Full (also gets an energy payment)</li> </ul> <p><b>Mandatory</b> reduction for PJM Load Management emergency event</p> 	<ul style="list-style-type: none"> <li>• Synchronous Reserves</li> <li>• Regulation</li> <li>• DA Scheduling Reserves</li> </ul> <p>Load bids into these markets and responds to an event exactly like a generator</p> <p><b>Mandatory</b> response to a Synchronous Reserve event if cleared in market</p>

## Load Serving Entity:

*PJM Member, including Load aggregator or power marketer, serving end-users within the PJM Control Area, to sell electric energy to end-users within the PJM Control Areas.*

## Generator:

*PJM Member that owns, or leases, facilities for generation of electric energy that are located within the PJM Control Areas.*

*End  
Use  
Customer*

## Curtailment Service Provider:

*PJM Members that will act on behalf of end-use customers who wish to participate in PJM Load Response opportunities.*

## Electric Distribution Company :

*PJM Member that owns, or leases, electric distribution facilities that are used to provide electric distribution service to electric load within the PJM Control Areas.*

## EMERGENCY

### Energy Only Option

- PJM sends notification of event via All Call to CSP
- Energy payment
- Voluntary Curtailment

### Capacity Only Option

- PJM sends notification of event via All Call to CSP
- Capacity value
- Mandatory Curtailment

### Full Emergency Option

- PJM sends notification of event via All Call to CSP
- Energy payment and capacity value
- Mandatory Curtailment

## ECONOMIC\*\*

### Day Ahead Market

- CSP Submit Day Ahead Bid in eMKT
- PJM Notifies CSP via eMKT
- Obligated in Real Time if Bid clears

### Real Time Market

- CSP Notifies PJM via email one hour prior to reduction
- Voluntary Curtailment

### Dispatched by PJM in Real Time

- CSP Submits operational info via eSuites
- PJM Notifies CSP via email

*\*\*Except Real Time LMP Based Customer*

## EMERGENCY

### PJM pays Zonal LMP

- Resource is made whole to its offer value, which includes:
  - Minimum dispatch price
  - Minimum down time
  - Shutdown costs
- Full Emergency participants also receive capacity value
- Emergency – Capacity Only participants receive capacity value only

## ECONOMIC \*\*

### PJM pays Zonal LMP – Retail Rate

Retail Rate = Generation +  
Transmission portion of the  
LSE retail charges (G & T)

[ Incentives for the Economic Program  
expired December 31<sup>st</sup>, 2007 ]

*\*\*Except Real Time LMP Based Customer*

	<b>Day Ahead LMP Based Customers</b>	<b>Real Time LMP Based Customers</b>
<b>Economic Program</b>	<b>May Participate</b>	<b>May Participate</b>
<b>Participation Options</b>	<ul style="list-style-type: none"> <li>•Real Time or Day Ahead</li> </ul>	<ul style="list-style-type: none"> <li>•Real Time Market Only</li> </ul>
<b>Operations</b>	<ul style="list-style-type: none"> <li>•Clear in the Day Ahead Market</li> <li>•Self-Schedule a Load Reduction in Real Time Market</li> <li>•Dispatched by PJM in Real Time Market</li> </ul>	<ul style="list-style-type: none"> <li>•Dispatched by PJM in Real Time Market</li> </ul>
<b>Compensation</b>	<ul style="list-style-type: none"> <li>•As defined by the program</li> </ul>	<p>PJM shall pay such end-use customer the difference between the actual savings achieved based on zonal LMP and the total value of the end-use customer's load response bid, if savings achieved by the end-use customer are less than the total value of the load response bid.</p>

# References

# DSR Information on PJM.com

PJM - Microsoft Internet Explorer provided by PJM Interconnection

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Market Settlements  
Capacity Credit  
Market Monitoring  
**Demand Response**  
Reliability Pricing Model  
Marginal Losses

Reference Materials  
DR Membership  
Curtailment Service Providers  
Data  
DR Energy Market  
DR Capacity Market  
DR Synchronized Reserve Market  
DR Regulation Market

Working to Perfect the Flow of Energy

PJM Interconnection, a regional transmission organization, plays a vital role in the U.S. electric power system.

- PJM ensures the reliability of the electric power supply system in 13 states and the District of Columbia.
- PJM operates an efficient, effective wholesale electricity market.
- PJM manages a long-term regional electric transmission planning process to maintain the reliability of the power supply system.

This Web site provides all stakeholders and the public with information about the electric power system. PJM's members, currently more than 450, conduct much of their business here.

Online tools provide real-time data about the electric grid. Members use the tools to buy and sell power, arrange transmission service, and submit

PJM Celebrating

RTO Load  
115249  
as of 09:35 AM EPT

LMP Data  
b) \$87.62 as of 08/08/07

Recent News

- [PJM Board of Managers Announces CEO Phillip G. Harris' Retirement; Karl V. Pfirrmann Named Interim President and CEO \(07.23.2007\)](#)

<http://www.pjm.com/markets/demand-response/demand-response.html>

Trusted sites

## Load Response Business Rules Link:

<http://www.pjm.com/markets/demand-response/downloads/documentation/load-resp-business-rule.pdf>

[> search](#)  
[> advanced search](#)

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### Quick Links

LMP: [Day-Ahead](#) | [Real-Time](#)  
[Operational Data](#)  
Login: [eSuite](#) | [eData \(Guest\)](#)  
[Emergency Procedures](#)  
[Training](#)

RTO Load

100093

as of 10:35 AM EPT

LMP Data

PJM (Zone) \$90.46 P

Click on eData (Guest) from the PJM Homepage (PJM.com)

PJM - Curtailment Service Providers - Microsoft Internet Explorer provided by PJM Interconnection

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## Curtailment Service Providers

Below is a listing of curtailment service providers (CSP) who participate in the PJM load response program. The list is broken down by [all](#), [multiple](#) and [single](#) states within the PJM footprint.

For more information on the territory served by PJM, please visit our [maps](#). If you are a CSP and wish to supply your company's contact information, complete the [enrollment/change form](#).

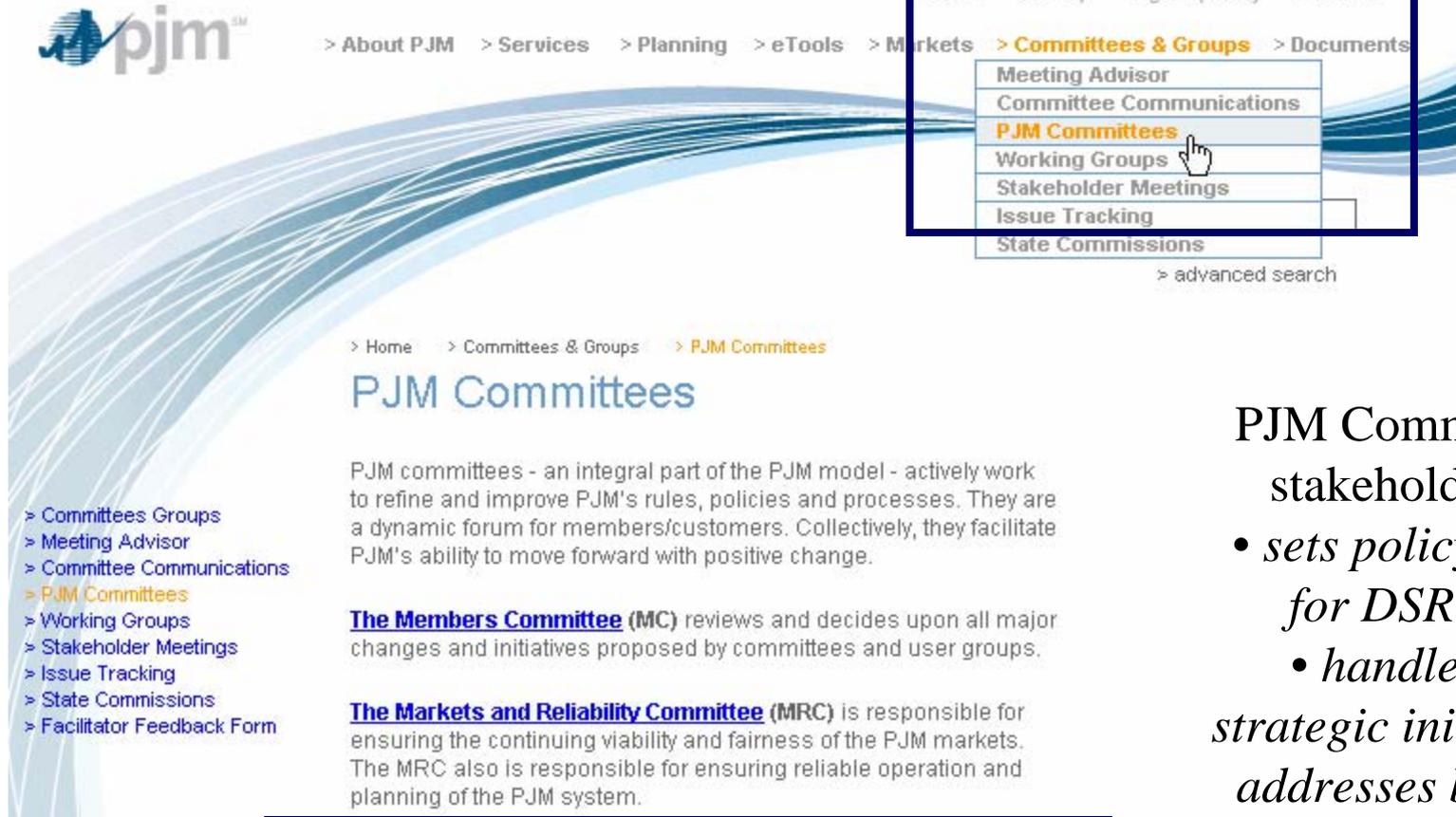
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[DR Synchronized Reserve Market](#)  
[DR Regulation Market](#)

### CSPs Who Participate in ALL States within the PJM Footprint

Company	Contact	Active Zone(s)
American PowerNet	David Butsack Phone: 610-372-8500 E-mail: <a href="mailto:David.Butsack@americanpower.net">David Butsack</a>	All
Baltimore Gas & Electric	David E. Greenberg Phone: 410-234-5216 Email: <a href="mailto:David.E.Greenberg@bge.com">David E. Greenberg</a>	All

<http://www.pjm.com/markets/demand-response/curtailment.html>

Trusted sites



The screenshot shows the PJM website navigation menu with the following items: > About PJM > Services > Planning > eTools > Markets > **Committees & Groups** > Documents. A dropdown menu is open under 'Committees & Groups', listing: Meeting Advisor, Committee Communications, **PJM Committees**, Working Groups, Stakeholder Meetings, Issue Tracking, and State Commissions. Below the dropdown is a link for '> advanced search'.

The main content area shows the breadcrumb trail: > Home > Committees & Groups > **PJM Committees**. The title is 'PJM Committees'. The text describes PJM committees as an integral part of the PJM model that actively work to refine and improve PJM's rules, policies, and processes. It lists several committees:

- The Members Committee (MC)** reviews and decides upon all major changes and initiatives proposed by committees and user groups.
- The Markets and Reliability Committee (MRC)** is responsible for ensuring the continuing viability and fairness of the PJM markets. The MRC also is responsible for ensuring reliable operation and planning of the PJM system.

**The Demand Response Steering Committee (DRSC)** is responsible for setting policy direction for other committees and working groups aimed at promoting effective demand response market participation through development of clear and consistent market rules. This Committee reports to the Markets and Reliability Committee.

- PJM Committee with stakeholder input:
- *sets policy direction for DSR in PJM*
    - *handles broad strategic initiatives that addresses barriers to entry, regulatory policy, education protocols, etc.*

- **PJM Web**
  - [www.pjm.com](http://www.pjm.com) (PJM Homepage)
  - <http://www.pjm.com/etools/edata-guest-browser-requirements.html#> (PJM eData Guest Login)
  - <http://www.pjm.com/services/training/train-media.html> (PJM Online Training)
- **PJM Member Relations:**
  - <http://www.pjm.com/about/contact/form-contact.html>
  - 610-666-8980
  - 866-400-8980

