# REGIONAL ENERGY RISK

## SPRING 2005 PEAK LOAD MANAGEMENT ALLIANCE CONFERENCE

Stone Mountain Park, Georgia

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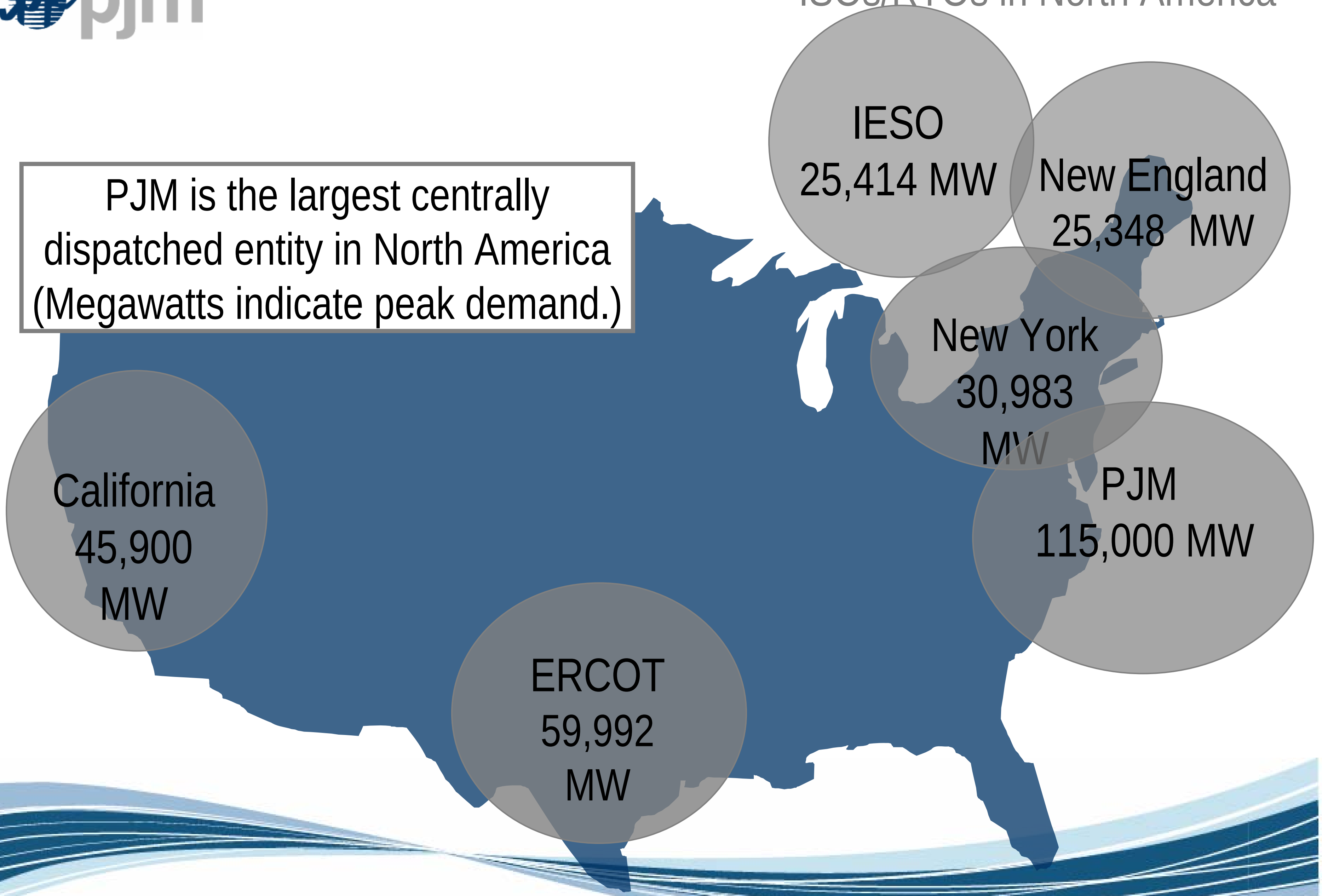
PJM Manager - Demand Side Response

- Operates the largest electric power system in the world
  - Controls a reliable transmission system
  - Administers regional wholesale electric markets
  - Provides for comprehensive regional transmission expansion planning
- Provides market monitoring coordinated with states and the FERC
- Provides an information resource for market participants and regulators

ISOs/RTOs in North America

PJM is the largest centrally dispatched entity in North America (Megawatts indicate peak demand.)



# Key PJM Statistics

| Key PJM Statistics | PJM Today | PJM + Dominion |
|---|---|---|
| Millions of people served | 45 | 51 |
| Peak load in megawatts | 115,000 | 130,580 |
| Megawatts of generating capacity | 143,420 | 166,220 |
| Miles of transmission lines | 49,970 | 56,070 |
| Gigawatt-hours of annual energy | 474,000 | 563,700 |
| Generation sources | 1001 | Approx. 1,100 |
| Area served | 12 states + D.C. | 13 states + D.C. |

## EMERGENCY

Designed to provide a method by which end-use customers may be compensated by PJM for voluntarily 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

**Two options:**
Day-Ahead Option
Real-Time Option

# Payments, Costs and Risks

| Program | Participation | Payment to Load Reducer | Cost to Energy Market | Risks to Load Reducer |
|---|---|---|---|---|
| **Emergency** | **Emergency event** | PJM pays higher of Zonal LMP or $500/MWh | Costs recovered for emergency purchases in excess of LMP are allocated among PJM market buyers in proportion to their increase in net purchases | **No Charges for Non Performance** |
| **Economic** | **Day-Ahead Market**<br>**Rea-Time Market**<br>**dispatched by PJM** | **If Zonal LMP < $75/MWh,**<br>PJM pays LMP - Retail Rate [Retail Rate = Generation + Transmission]<br><br>**If Zonal LMP > = $75/MWh,**<br>PJM pays LMP | **If Zonal LMP < $75/MWh**,<br>PJM recovers LMP less Retail Rate from LSE<br><br>**If Zonal LMP > = $75/MWh,**<br>PJM recovers LMP less Retail Rate from LSE<br>PJM recovers Retail Rate from all LSEs in zone | **Charges for Non Performance:**<br>If load reduction is committed in Day-Ahead Market and does not perform in real time<br>**Real-Time LMP * Shortfall**<br>**+**<br>**Balancing Operating Reserves Charges** |
| **Economic – Real-Time LMP Based Customers** | **Real-Time Market only**<br>***Must be dispatched by PJM*** | ***For duration of the load reduction dispatched by PJM,***<br>**Actual Savings**<br>[RT LMP * MW Reduction]<br>**-**<br>**Total Bid Value**<br>[(Strike Price * MW Reduction) + Shutdown Costs ] | Costs recovered from Operating Reserves in the Real-Time Energy Market | **No Charges for Non Performance** |

| EMERGENCY | |
|---|---|
| **2002** | |
| 61 | New registered sites |
| 548 | MWs |
| **2003** | |
| 107 | New registered sites |
| 111 | Additional MWs |
| **2004** | |
| 4,147 | New registered sites |
| 1,124 | Additional MWs |

| ECONOMIC | |
|---|---|
| **2002** | |
| 116 | New registered sites |
| 337 | MWs |
| **2003** | |
| 129 | New registered sites |
| 387 | Additional MWs |
| **2004** | |
| 1,784 | New registered sites |
| 1,395 | Additional MWs |

- Emergency program: Active sites: 4,301 / Total MWs: 1,783 MWs
- Economic program: Active sites: 2,023 / Total MWs: 2,119 MWs
- Total program: Total active sites: 6,324 / Total MWs: 3,902 MWs
- Note: Sites can switch programs, relocate out of PJM footprint, and increase load
- Last updated: 1-6-05

# Total system impact is modest

| | Emergency Program | | | | Economic Program | | | |
|---|---|---|---|---|---|---|---|---|
| Year | Sites | MW | Payments | | Sites | MW | Payments | |
| 2002 | 61 | 548 | $ 177,000 | | 116 | 337 | $ 895,000 | |
| **2003** | **168** | **659** | **$ 26,600** | | **245** | **724** | **$ 848,000** | |
| 2004* | 4,315 | 1,783 | $ - | | 317 | 2,892 | $ 1.5M | |

**Thru September 2004*

- Forward Energy Reserve (“FER”) product
- Emergency Load Response Enhancements
- DSR sub model – Reliability Pricing Model
- DSR as reserves (spinning and regulation markets)
- Economic Load Response – permanent market design

- Forward Energy Reserve (“FER”):
  - Denominated in 1 MW increments, for 4 hours, and 4 calls per month
  - Cleared in annual, multi-month, and/or monthly auctions
  - Paid a market clearing price consisting of a “call premium” and the “strike price”
  - Exercised in Day Ahead

- Require participants to indicate the price level at which they will reduce during an emergency – “minimum dispatch price”
- Incorporate the price level of an Emergency load reduction dispatched by PJM into LMP
- Create one market construct from the Emergency Load Response Program and Active Load Management with energy and capacity components.
- Allow aggregation of load response by Curtailment Service Providers as well as Load Serving Entities
- Devise penalties for failure to perform that are comparable to penalties for generation resources that get capacity payments.

- Elicit transparent and efficient long term regional market price signals for reliability (including locational operational features).
- Reduce barriers to entry and create opportunities for Demand Resources (DR).
- Treat demand and generation resources comparably.
- Maintain the measurement and verification processes for load reductions established for Active Load Management (ALM) resources.

- Spinning Reserves Market
  - Draft Business Rules developed and endorsed by DSR Working Group
  - Change name to Synchronized Reserves Market
  - Demand Resources qualify as Tier 2
  - Metering information at no less than 1 minute scan rate with daily uploads
  - Limitation on amount of Synchronized Reserve Requirement that Demand Resources can meet
- Regulation Market
  - Draft Business Rules developed and endorsed by DSR Working Group
  - Requirements for and treatment of Demand Resources are the same as Generation Resources

# Transition and Permanent Market Design

- Incentives
- Measurement and Verification

# Mid-Atlantic Distributed Resources Initiative (MADRI)

- Many impediments to the deployment of Distributed Generation and Demand Response are outside of direct PJM control.
- Early 04, PJM staff and DOE Mid-Atlantic  office began planning activities for a workshop to identify barriers and solutions to further the deployment of Distributed Resource
- Activities have matured into the formation of the Mid-Atlantic Distributed Resources Initiative (MADRI).
  - Organized under the leadership of:
    - Public Utility Commissions ( DC, DE, MD, PA, NJ)
    - PJM, DOE, EPA, FERC
  - Participation of interested regional stakeholders

**Initial focus areas for the working group include:**

- Distribution System Rate Making Policy
  - Break the thru put paradigm
- Retail Rates / Pricing Policy – Real-time pricing - in default service
  - Customers need to see and be impacted by price
  - Default service policy
- Encourage the development of regional policy with consistent rules
  - Interconnection
  - Air-permitting – output based standard
- Meter technology and data access
  - Develop policy and incentives to install interval meters
  - Provide direct  access to meter data
  - Leverage two way smart meter communication technology

**Initial focus areas for the working group include:**

- Leverage DG solutions in distribution system-
  - Develop policy and incentive rate making structure
  - DG deployment can be more cost effective than conventional distribution system upgrades
  - Deployment at customer sites or sub-stations
- Development of straw man business models
  - How can a single DG and DR be monetized in multiple markets
    - Wholesale
    - Distribution System
    - Behind the Meter
- Leveraging state funding sources
  - Technology funds established during restructuring