Regional Transmission Organizations: Successes and Challenges

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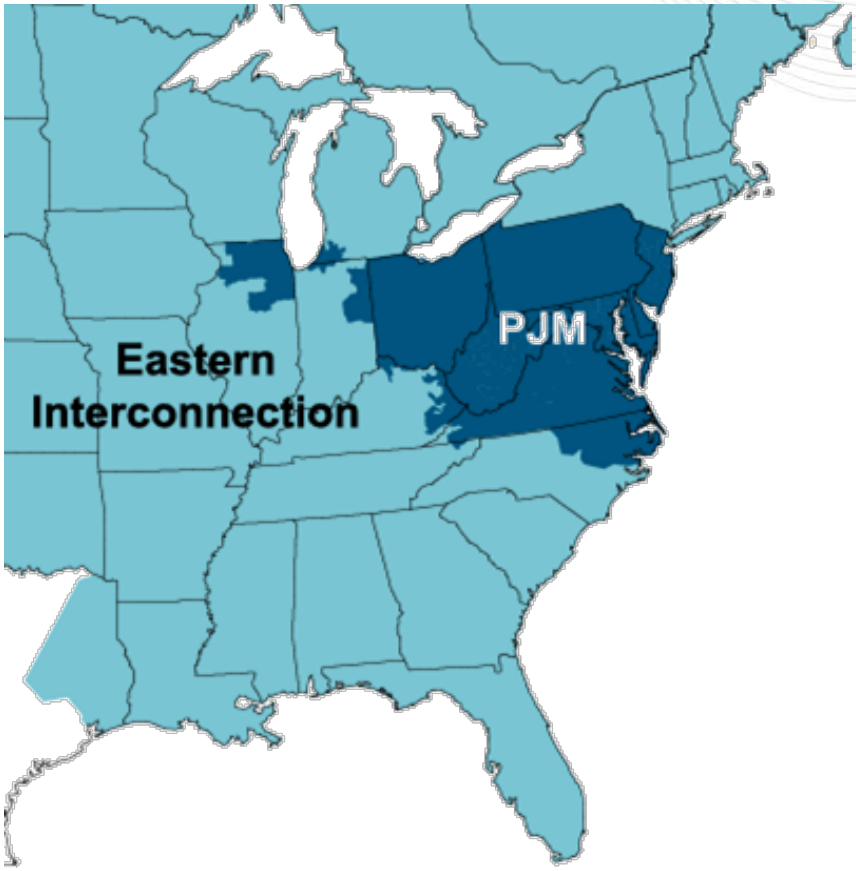
PJM: Who We Are



21% of U.S. GDP produced in PJM

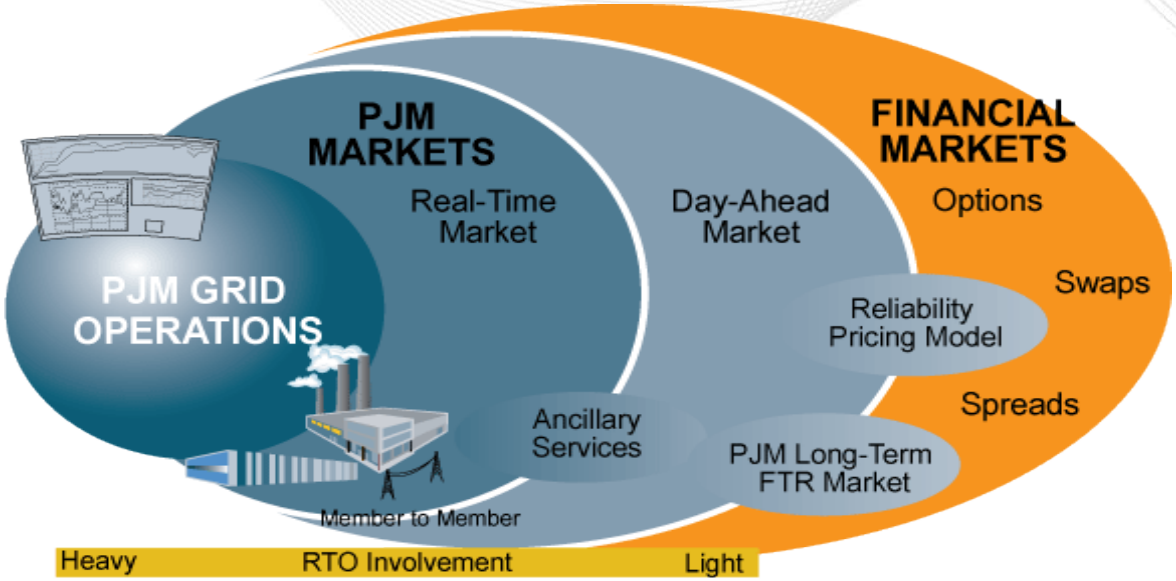
KEY STATISTICS

Member companies	800+
Millions of people served	60
Peak load in megawatts	163,848
MWs of generating capacity	185,600
Miles of transmission lines	59,750
GWh of annual energy	832,331
Generation sources	1,365
Square miles of territory	214,000
States served	13 + DC

As of 7/2012

PJM – Focus on Just 3 Things

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**

Success

- Wholesale Competition
- Operational Efficiency
- Transparency
- Reduced Barriers
- Innovation
- Product Development
- Economy of Scale
- Regional planning

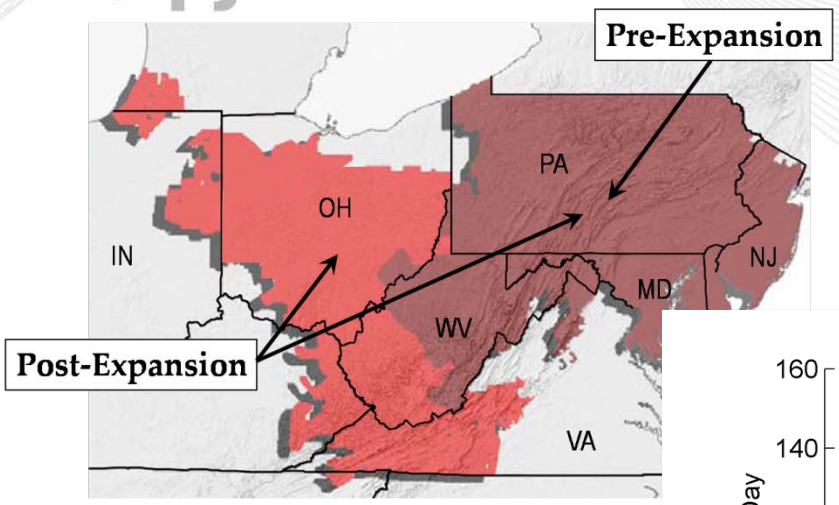
Challenges

- Governance
- Design Compromises
- Regional Differences
- Seams Issues
- Complexity
- Excessive regulation/mitigation

Advanced Market Systems

- Industry Leadership
- Customer Focused
  - eLoad Response
- Technology
  - Resource Control Application
  - Time-coupled Optimization
- Business Resiliency
  - Security
  - Dual Control Centers

PJM Market Expansion – A Case study

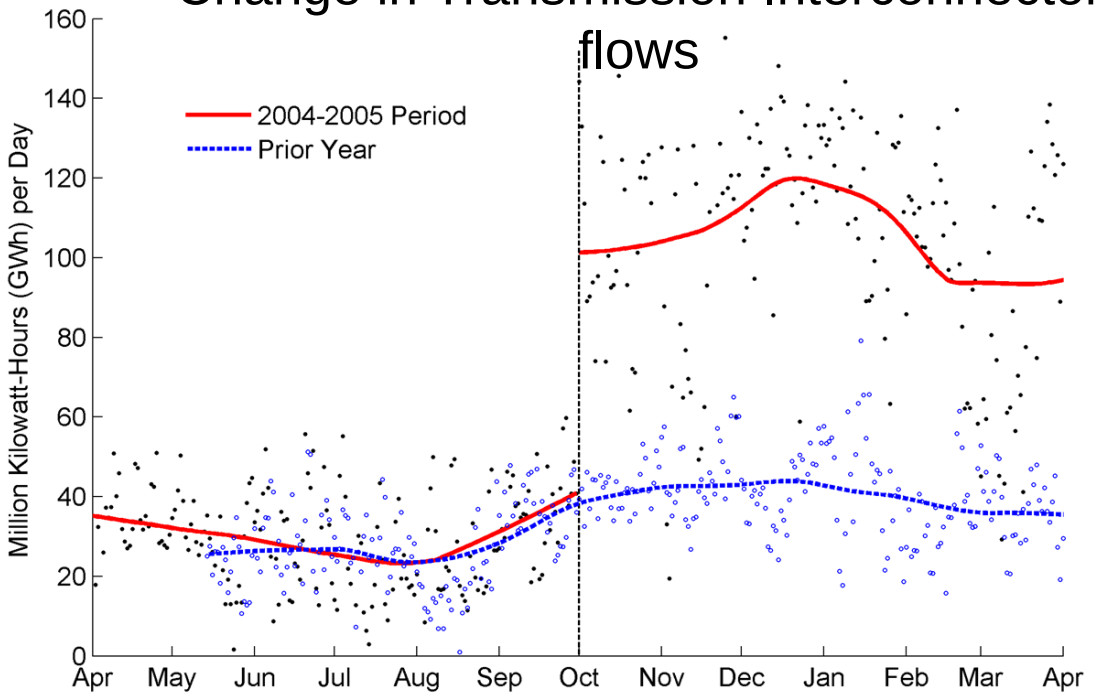


AEP / Dayton / ComEd Integration into the PJM Market

Key Study Conclusions:

- Bilateral Trading could only achieve 40% of the efficiency gains of LMP-based market
- Incremental benefit of LMP Market Integration = $180 Million annually, Net Present Value over 20 yrs is $1.5 Billion

Change in Transmission Interconnector flows



Referenced with Permission: Source: Erin T. Mansur and Matthew W. White, "Market Organization and Efficiency in Electricity Markets," March 31, 2009, Figure 2,pg 50, discussion draft, (available at http://bpp.wharton.upenn.edu/mawhite/).

Dominion Integration Benefits

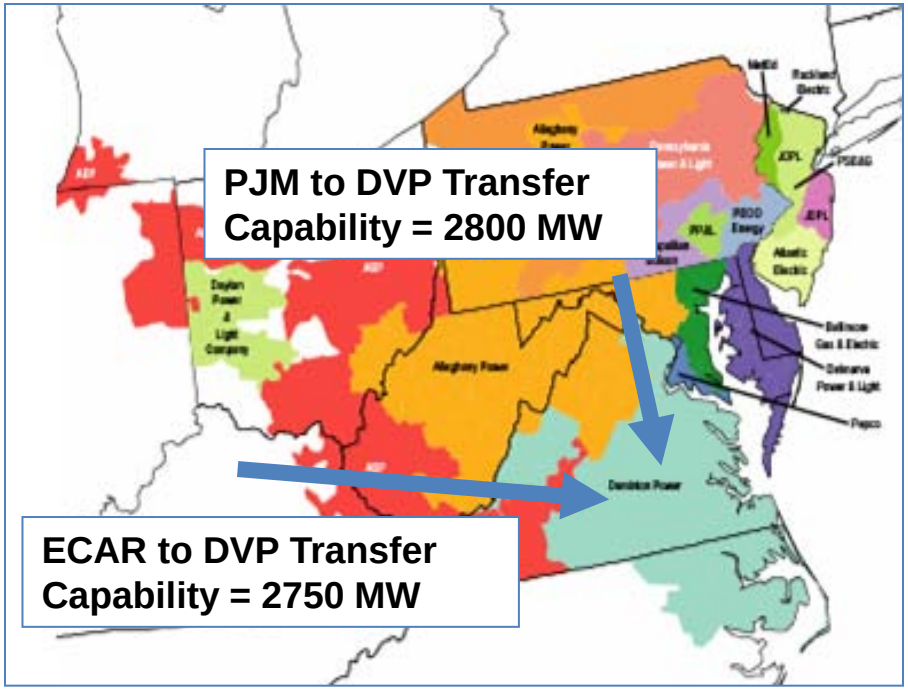
Projected Benefit to Dominion Zone customers was $291 to $542 Million for Ten year period (2005-2014)[1]

Actual Benefit[2]

- $750 Million in avoided fuel costs for the four year period from May 2005 through May 2009
- In 2008, measured benefit of $240 Million in energy cost savings and $90 Million in net FTR revenue

1. Dominion Study, Reported result in filing before VA State Corporation Commission, 2004
2. Greg Morgan, Dominion Executive, Testimony @ VA State Corporation Commission, June 2009

Prior to Integration



After Integration