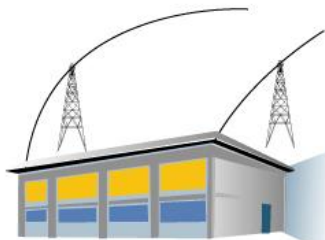
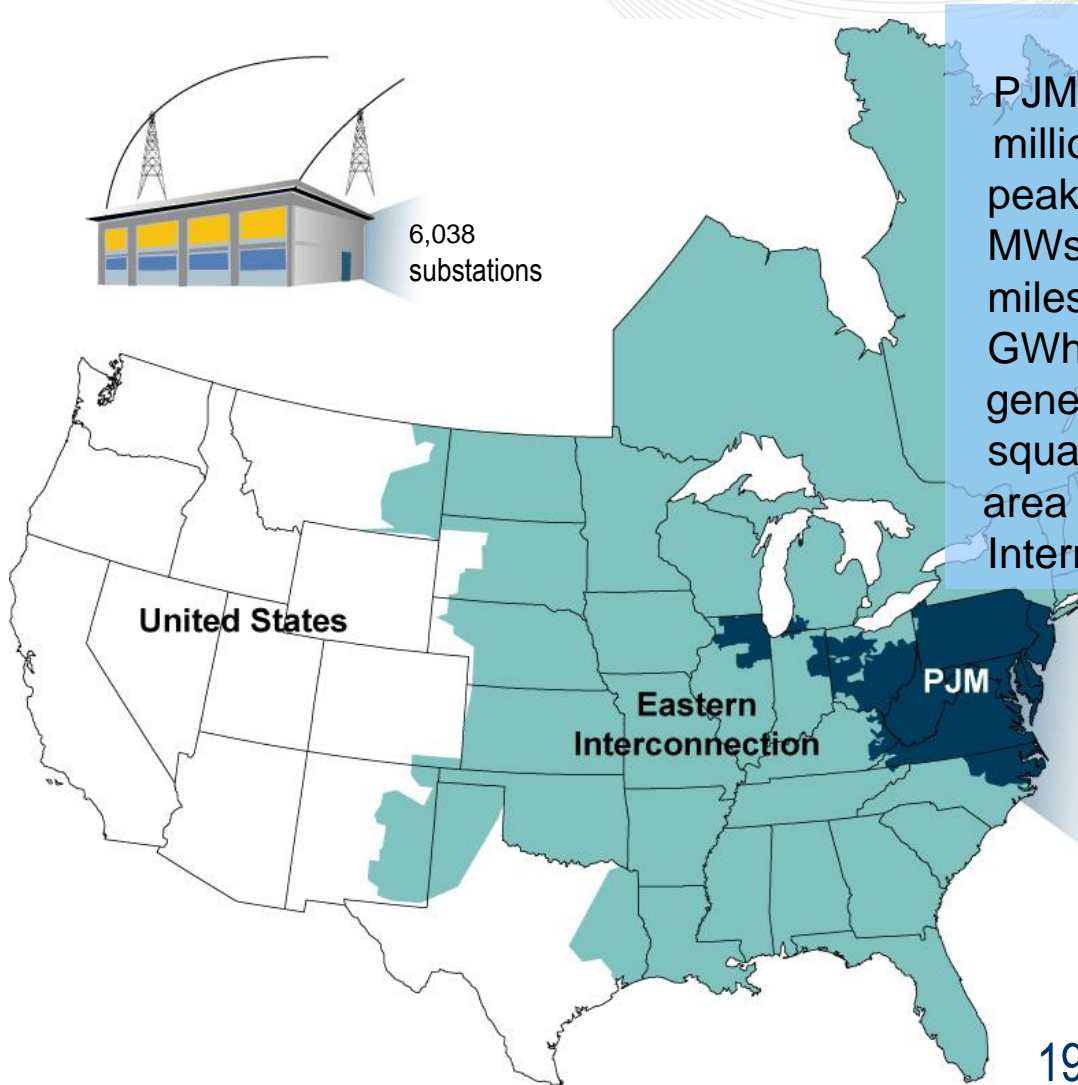


PJM Overview: PJM Structure and Cross-Border Examples





6,038
substations



KEY STATISTICS

PJM member companies	614
millions of people served	51
peak load in megawatts	144,644
MWs of generating capacity	167,326
miles of transmission lines	56,500
GWh of annual energy generation sources	682,000
square miles of territory area served	13 states + DC
Internal/external tie lines	247

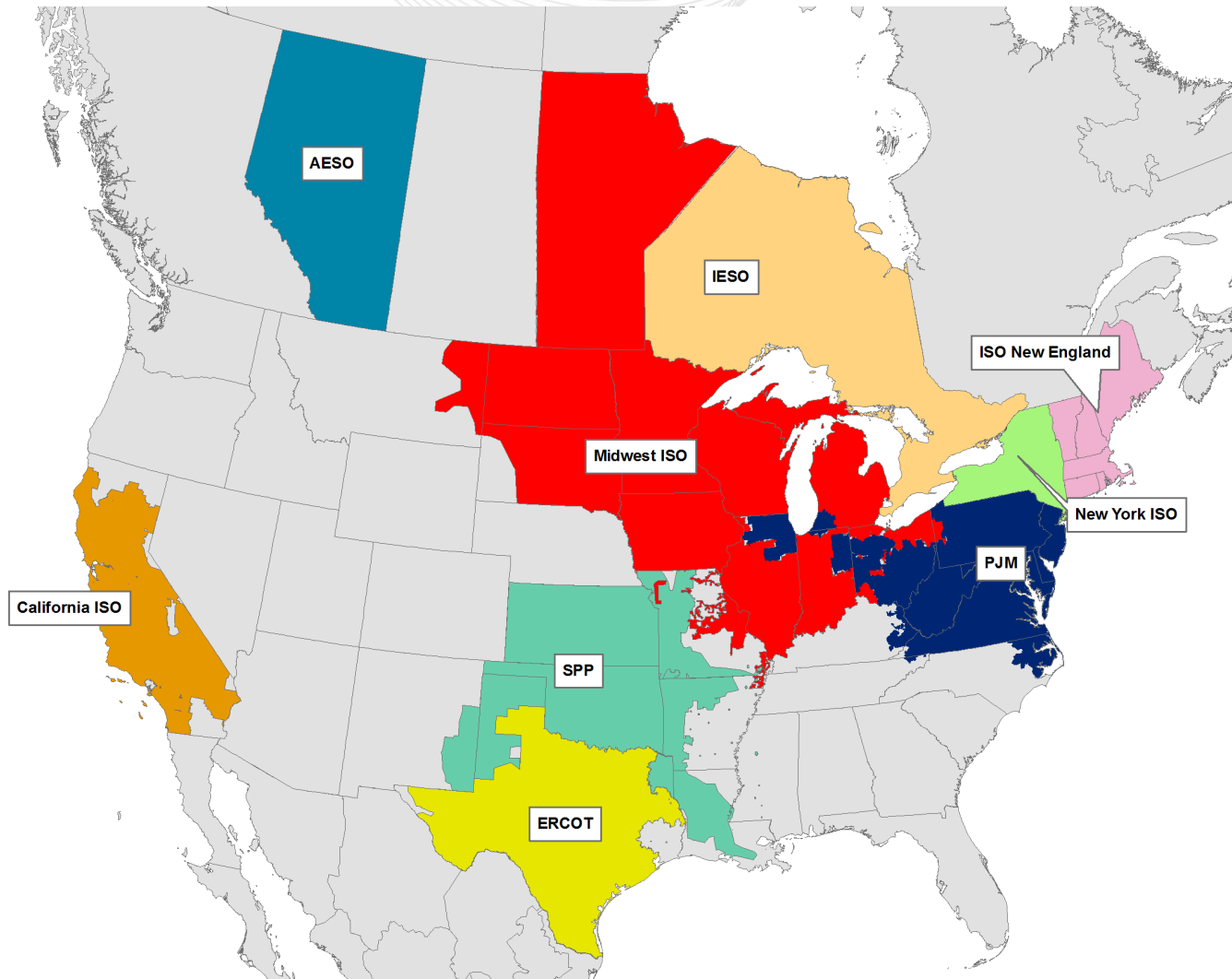
26% of generation in Eastern Interconnection

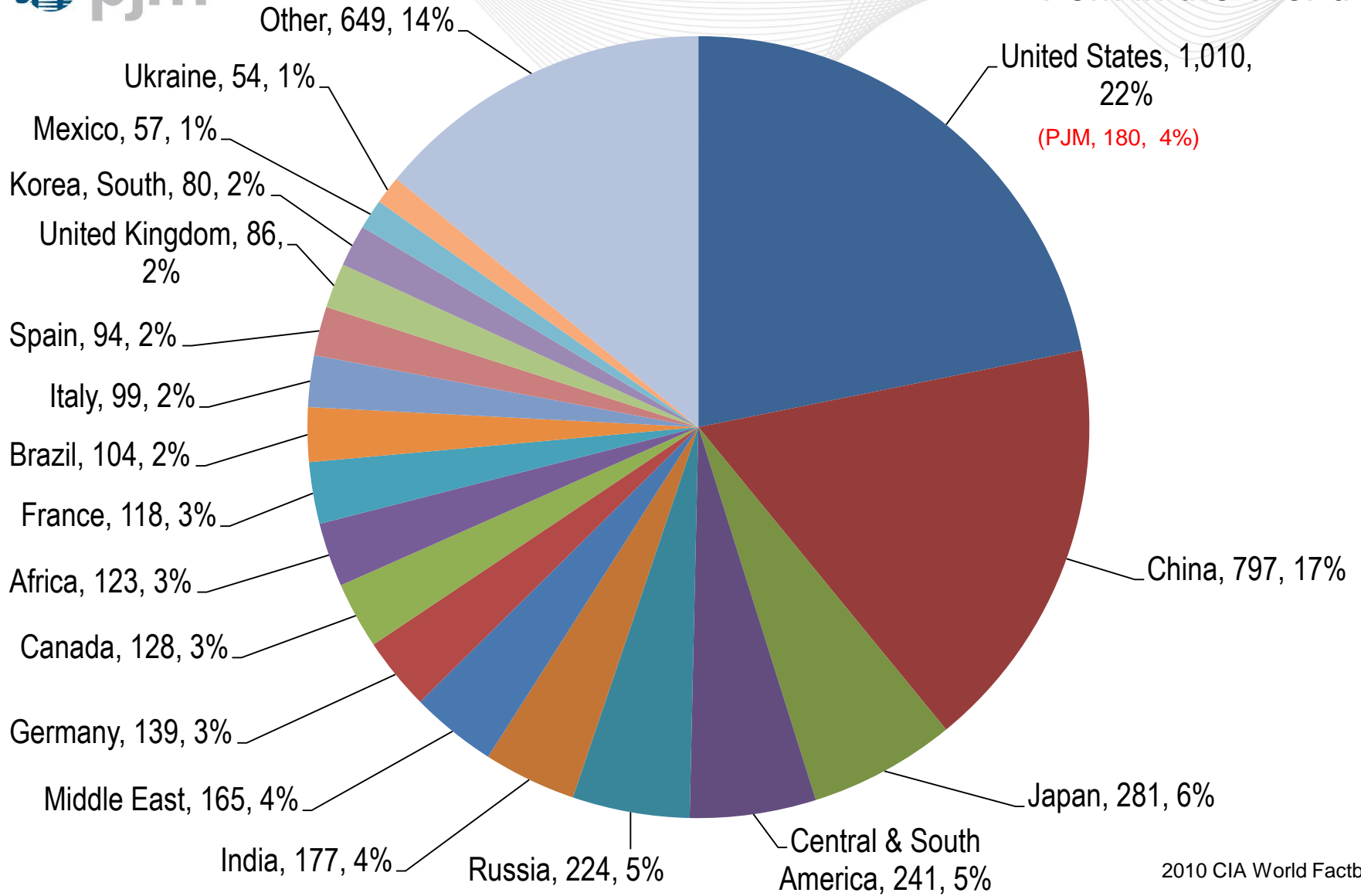
23% of load in Eastern Interconnection

19% of transmission assets in Eastern Interconnection

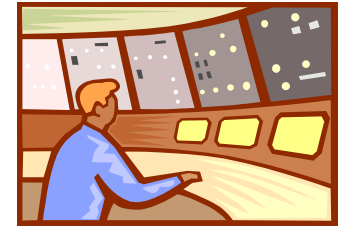
19% of U.S. GDP produced in PJM

Nine Major North American RTOs / ISOs





2010 CIA World Factbook



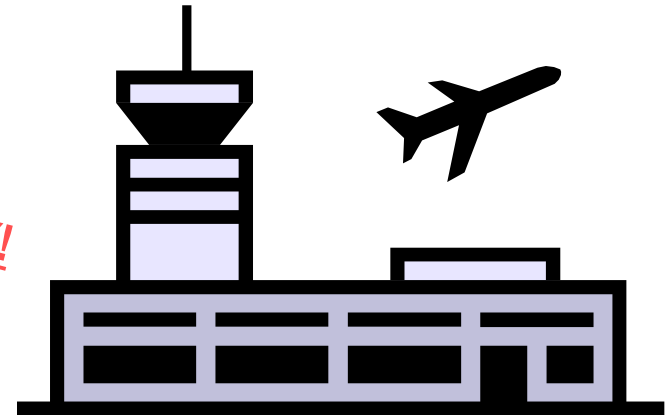
Operators of a Stock Exchange for Energy...

Air Traffic Controllers for the Transmission Grid....



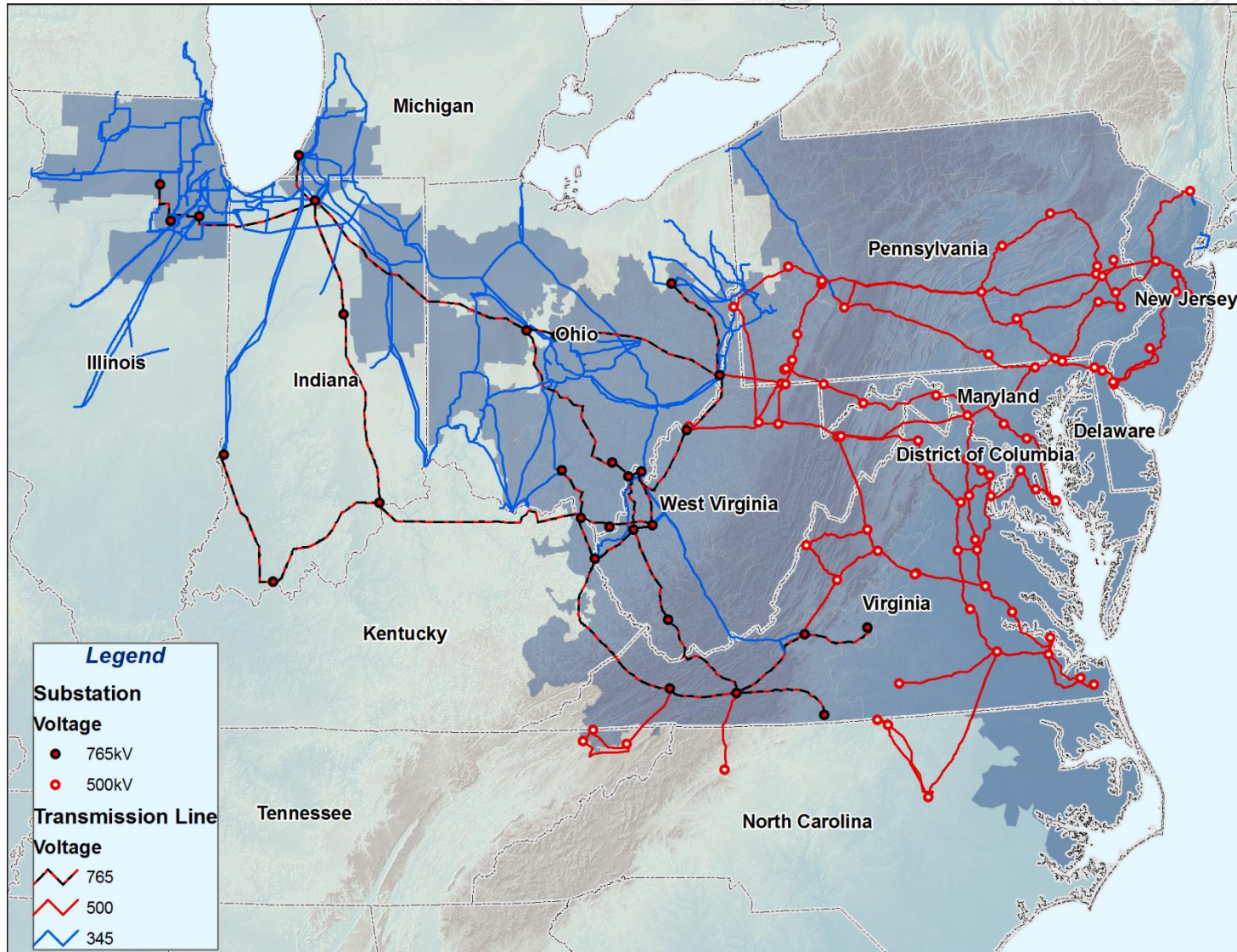
SIMULTANEOUSLY!

RELIABLY!



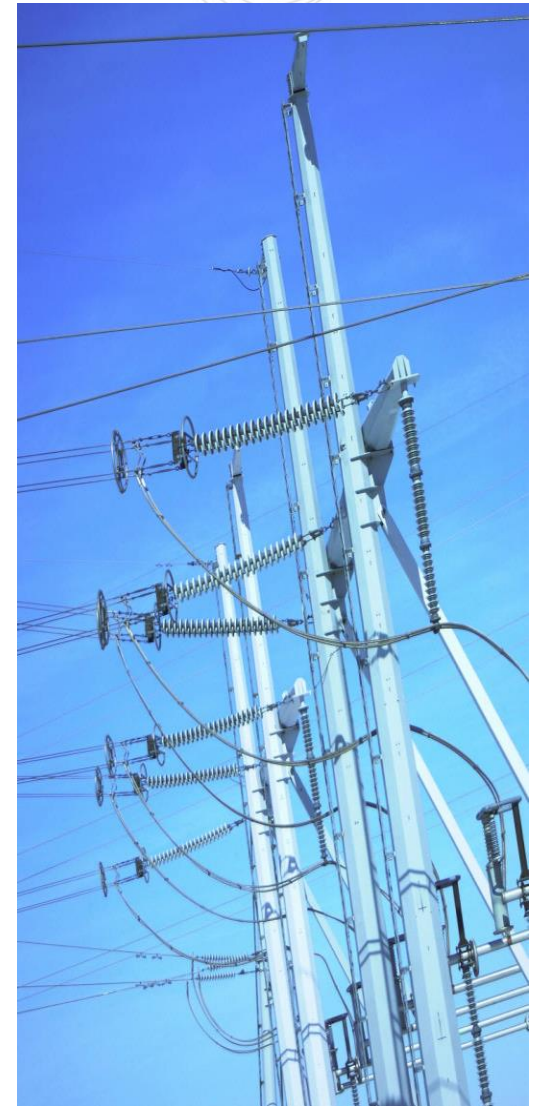
Match Generation to Load

- Operate the bulk electric power grid for reliability
- Facilitate various electric markets
- Plan for transmission expansion
- Monitor the markets to ensure competitiveness
- Provide exceptional customer/member service
- Share best practices with neighboring and international system operators



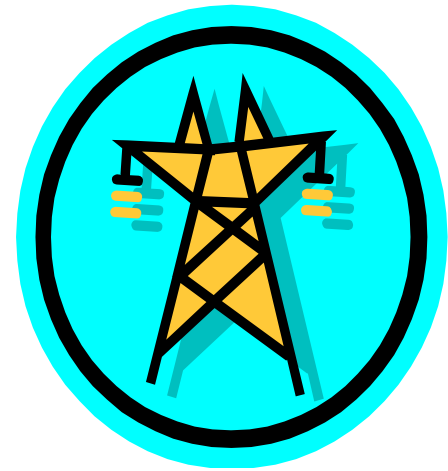
PJM does:

- Maintain the “big picture” of the transmission system regardless of ownership.
- Have, by agreement, operational control of the transmission system.
- Operate as “profit neutral.”
- Remain totally independent of all PJM members.
- Coordinates maintenance of generation and transmission systems.



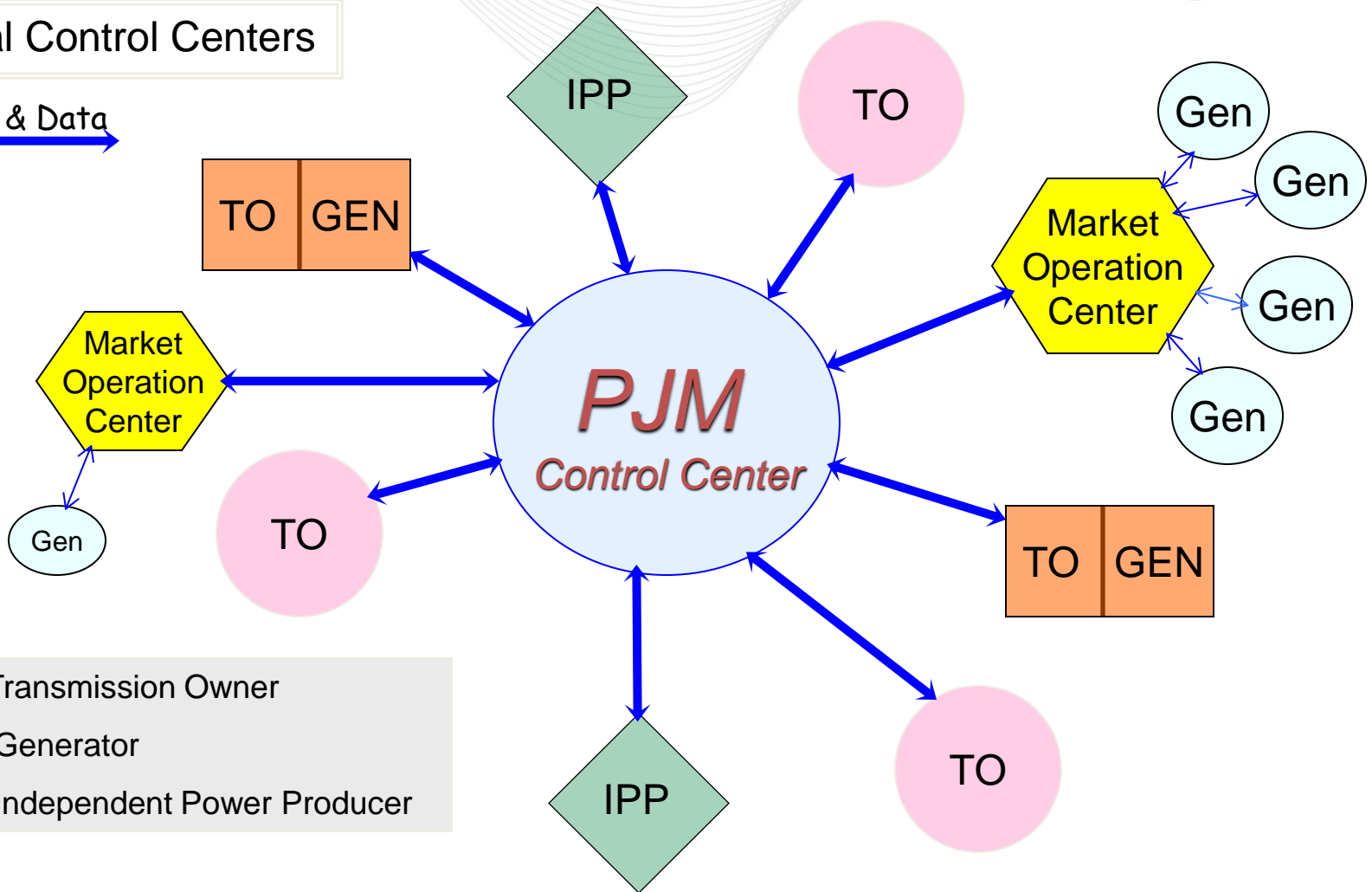
PJM does not:

- Own any transmission or generation assets.
- Function as a publicly traded company.
- Take ownership of the energy on the system.
- Perform the actual maintenance on generators or transmission systems.
- Serve, directly, any end use (retail) customers.



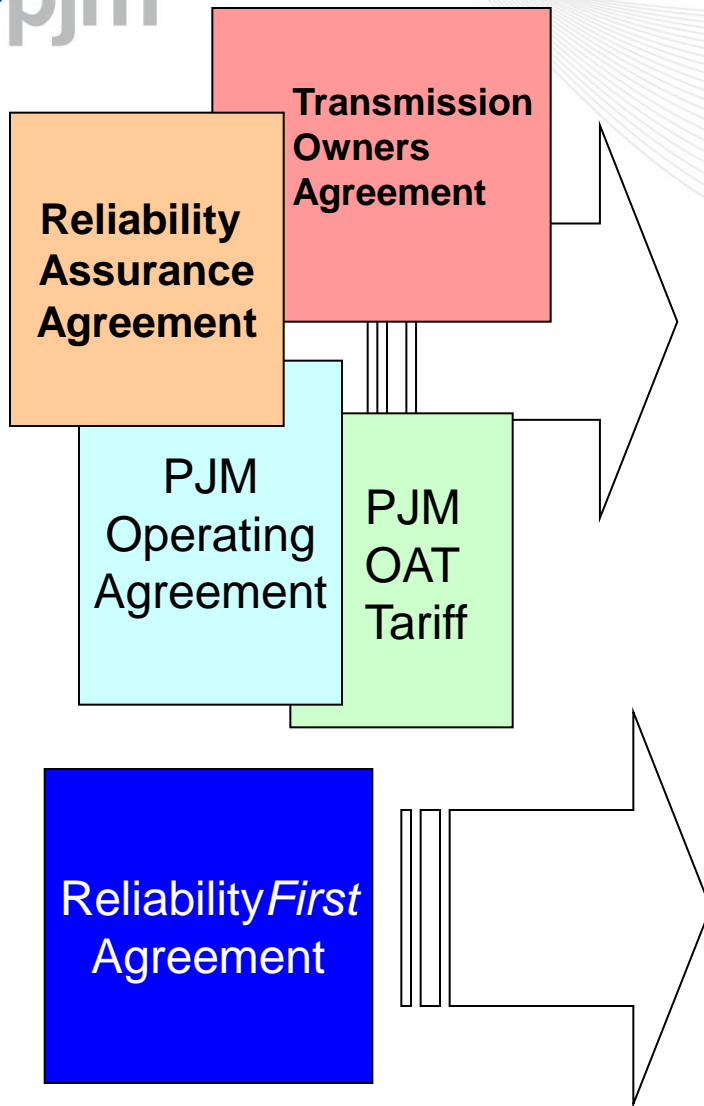
Local Control Centers

Voice & Data



Governance

PJM Authority Provided by Contract

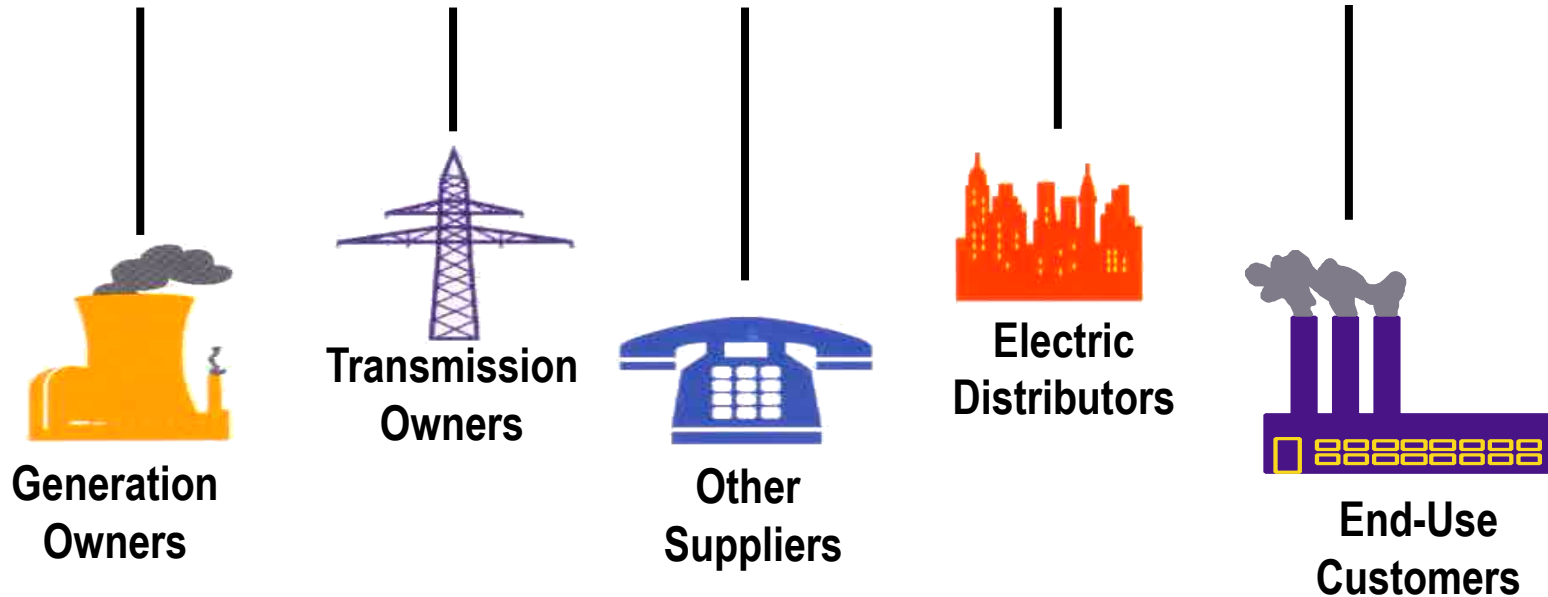


- Regional Transmission Provider
- Regional Control Area Operator
- Market Developer and Coordinator
- Regional Transmission Planner

- NERC Security Coordinator

Independent Board

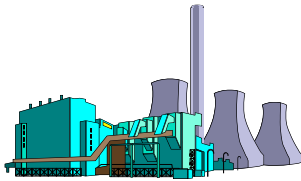
Members Committee



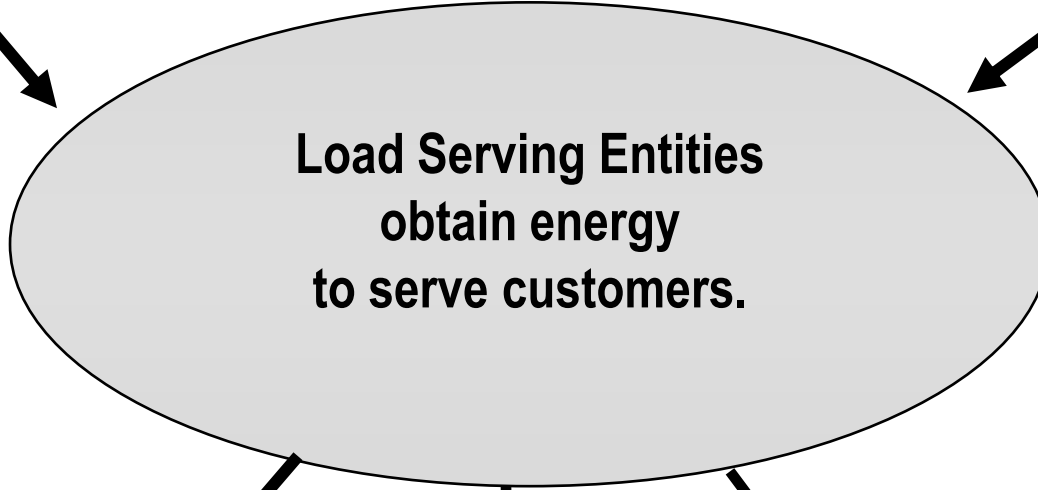
Overview of PJM Electricity Markets

**Bilateral
Transactions**

**Self-schedule
own resources**



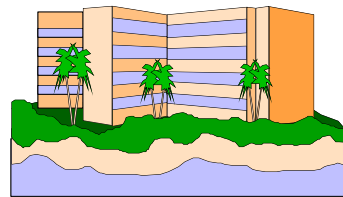
**PJM
Spot Market**



Industrial



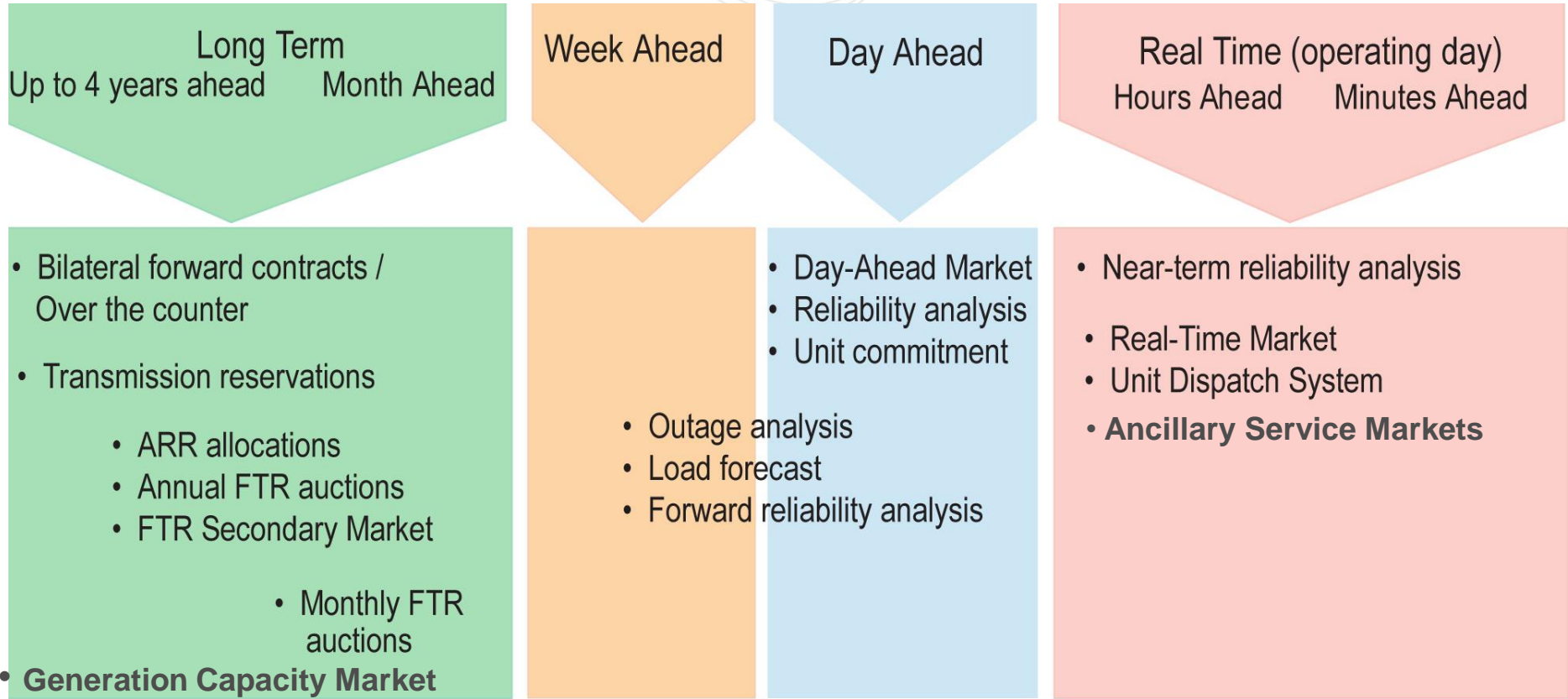
Commercial



Residential



- Two Energy Markets
 - Day-Ahead
 - Real-Time
- Reliability Pricing Model (RPM) Auction
- Financial Transmission Rights (FTRs) Auction
- Ancillary Services
 - Regulation Market
 - Synchronized Reserve Market
 - Blackstart Service
 - Reactive Services



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

- PJM invites resource-specific sell offers for planning each year, three years in advance.
- Products that may be offered include: existing and **planned** generation; planned transmission upgrades; and existing and **planned** demand resources
- New generation, new demand response alternatives, and new transmission solutions can compete directly with existing resources

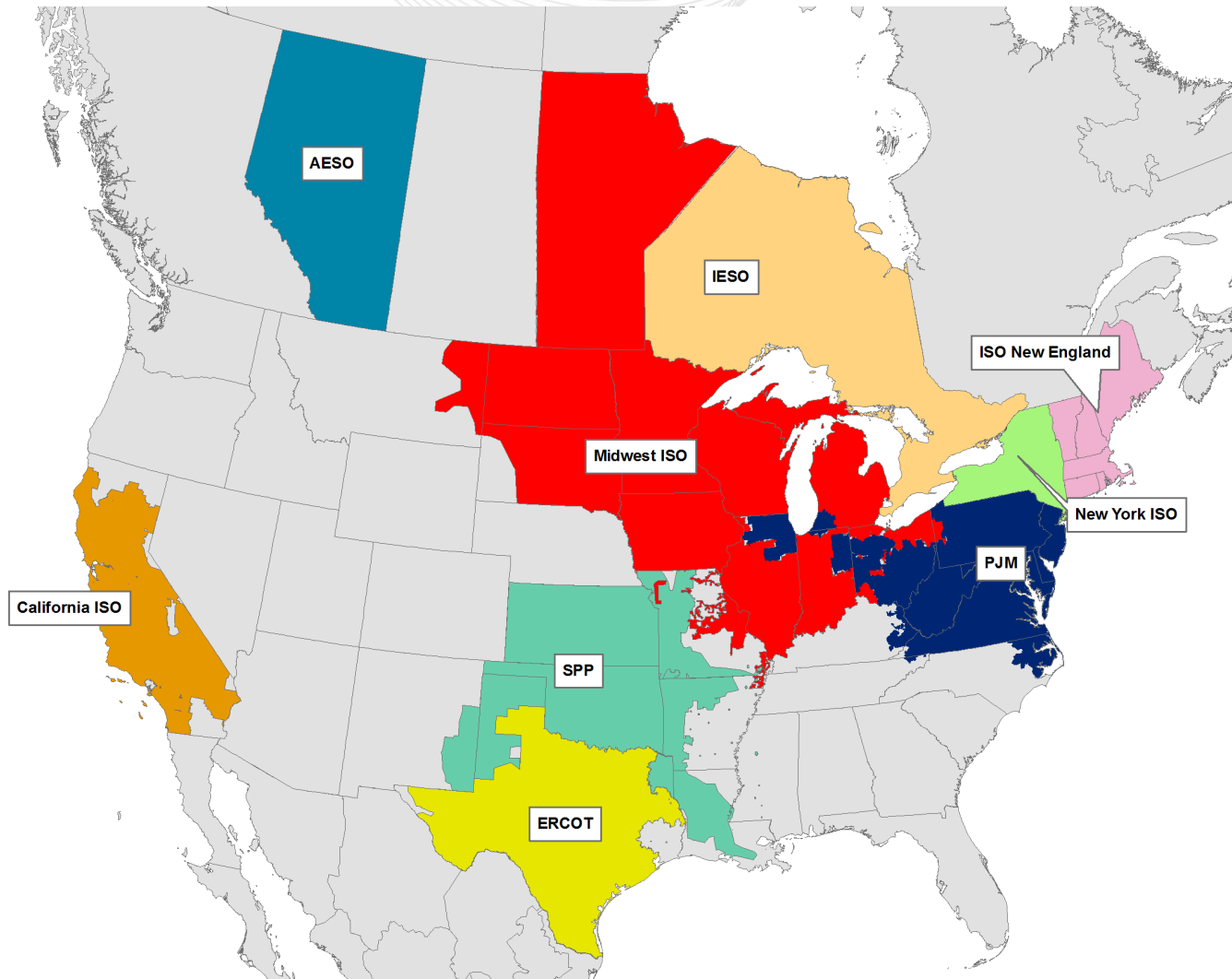
Transmission Planning

- Holistic Integrated Regional Planning Process
 - Integrate all needs and all solutions
 - Involve stakeholders
 - Stay focused on the states
- Fully Integrated Planning, Markets and Operations
- Infrastructure Management as an Integrated System – Single Entity Decision-Making
 - Well defined cost allocation / cost recovery
 - Perform risk assessments
 - Develop an aging infrastructure strategy

PJM Cross-Border Coordination

- Inter-regional
- International

Nine Major North American RTOs / ISOs



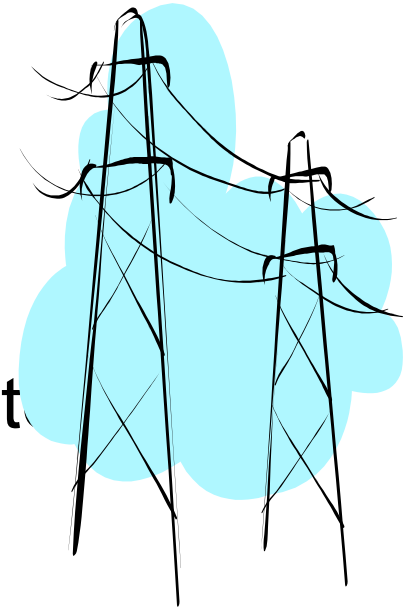
Joint Operating Agreement: PJM and Midwest ISO

- Congestion Management: Coordination of Flowgates
- Exchange of Operating Data: Real time generator data, planning data, facilities data
- Flow data, reliability data, interchange schedules
- Consistency of modeling for ATC, congestion management, outage scheduling

- Planning: Requirement of Cross-Border Benefits
 - Benefit/Cost Ratio of 1.25
- Coordination of Reliability Planning
- Economic Planning: identifying Market Efficiency Projects
- Joint Operating Agreement Link:
 - ***<http://www.pjm.com/~media/documents/agreements/joa-complete.ashx>***

Basic Cross-Border Tools:

- Redispatch of generation when cost effective to solve constraint across the border;
- Respecting and modeling each entity's AFC determinations;
- Outage schedule: Joint Approvals
- Emergency coordination
- Planning and cost allocation
of cross-border facilities: 1.25 benefit to ratio



LET'S TALK...



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