



# Regional Cooperation: Eastern Interconnection Transmission Planning in the U.S.

Presentation to:

**IEA ELECTRICITY SECURITY ADVISORY PANEL**

**APRIL 28, 2016**

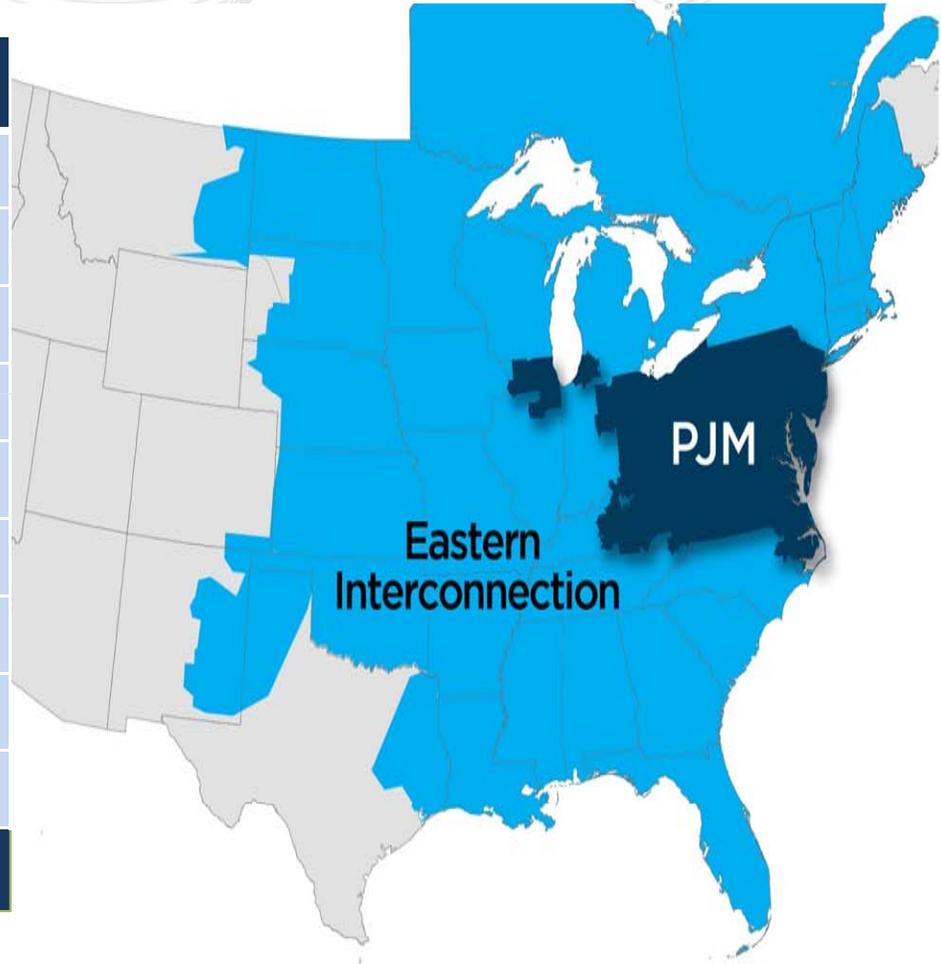


# PJM as Part of the Eastern Interconnection

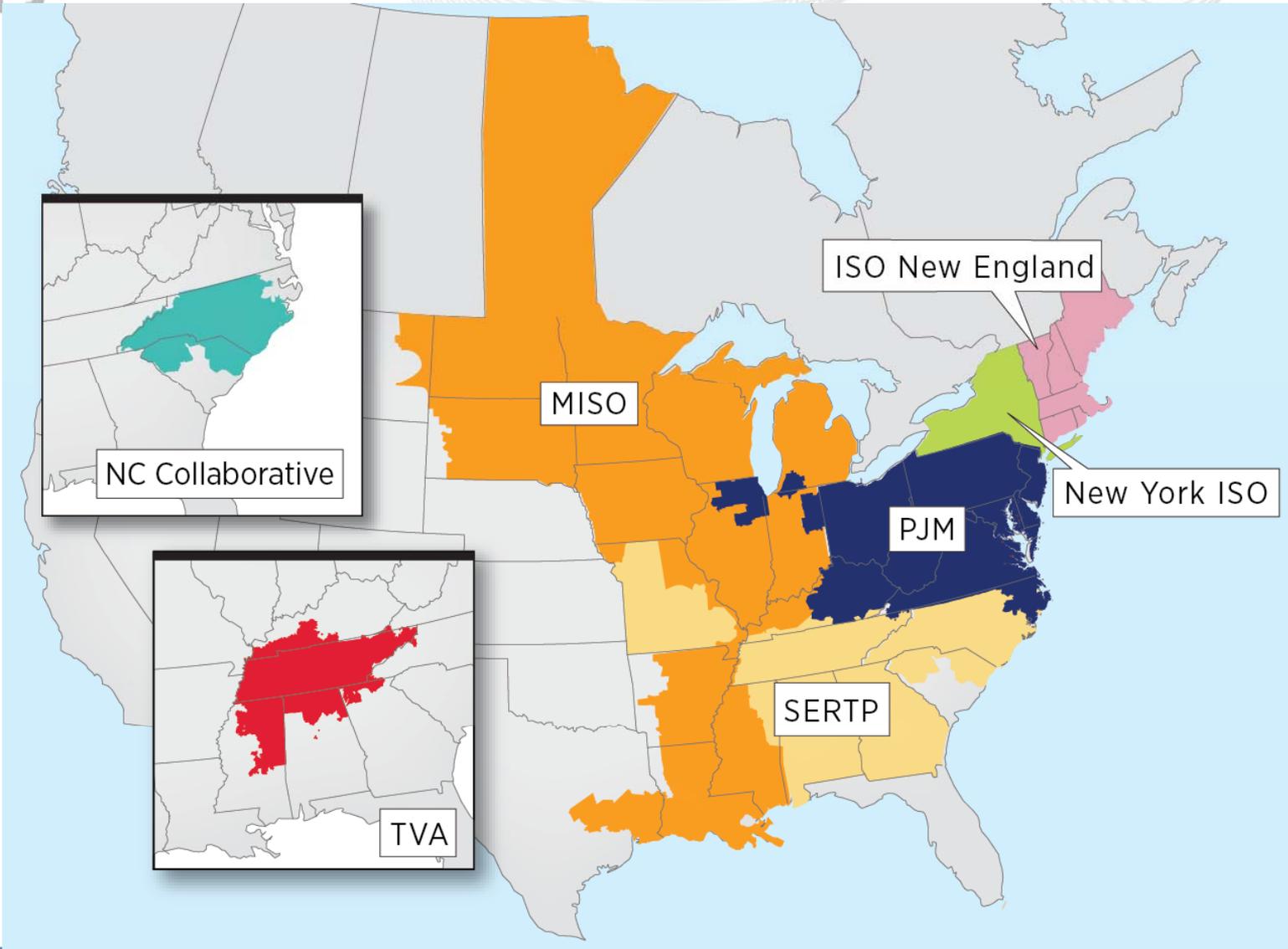
## Key Statistics

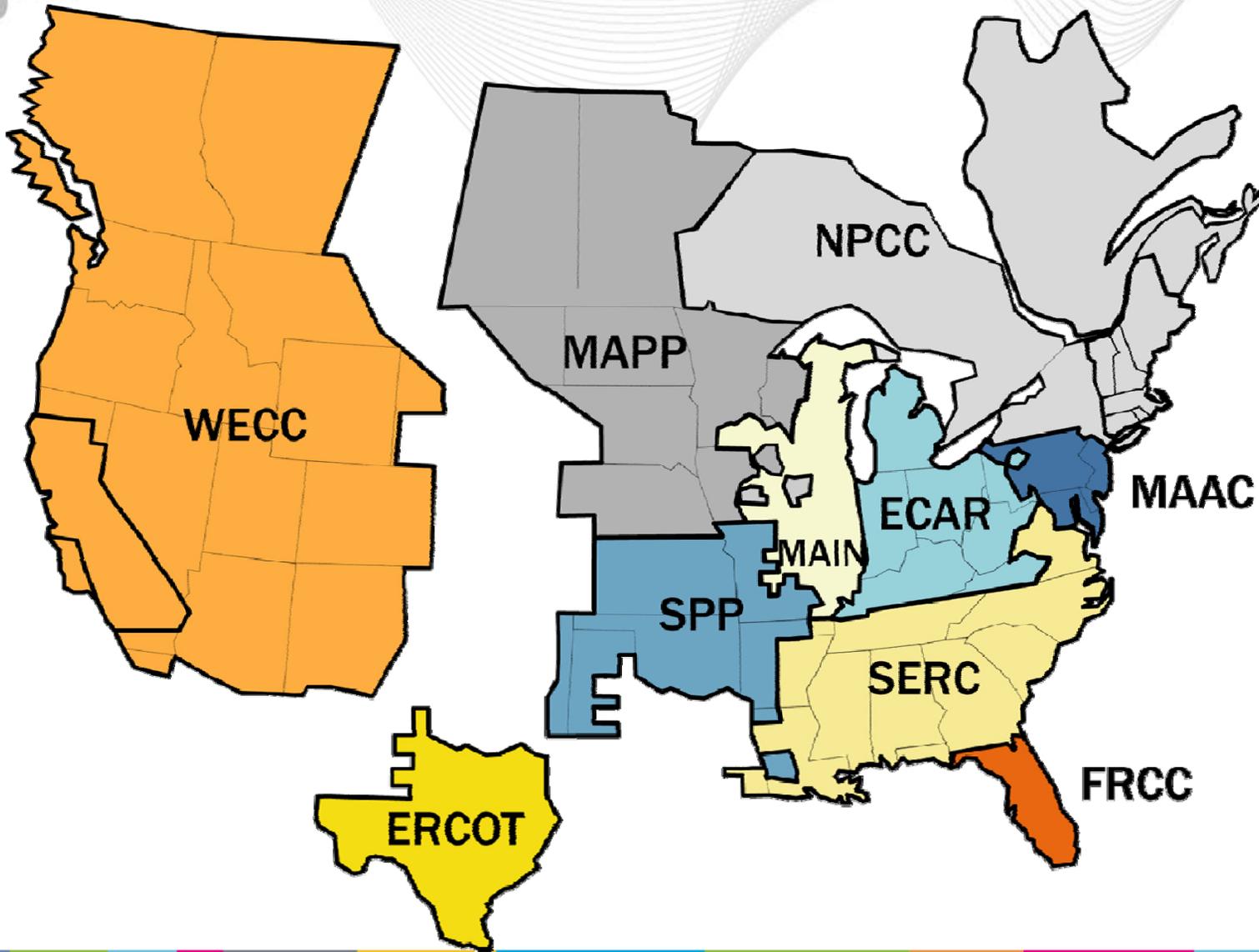
Member companies	960+
Millions of people served	61
Peak load in megawatts	165,492
MW of generating capacity	171,648
Miles of transmission lines	72,075
2014 GWh of annual energy	792,580
Generation sources	1,304
Square miles of territory	243,417
States served	13 + DC

**21% of U.S. GDP produced in PJM**



1/2016

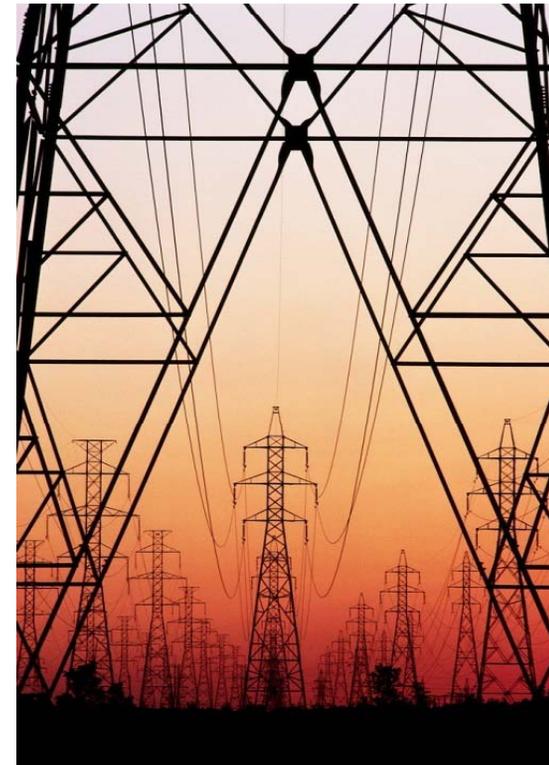






## The Regulatory Roadmap: FERC Order 1000

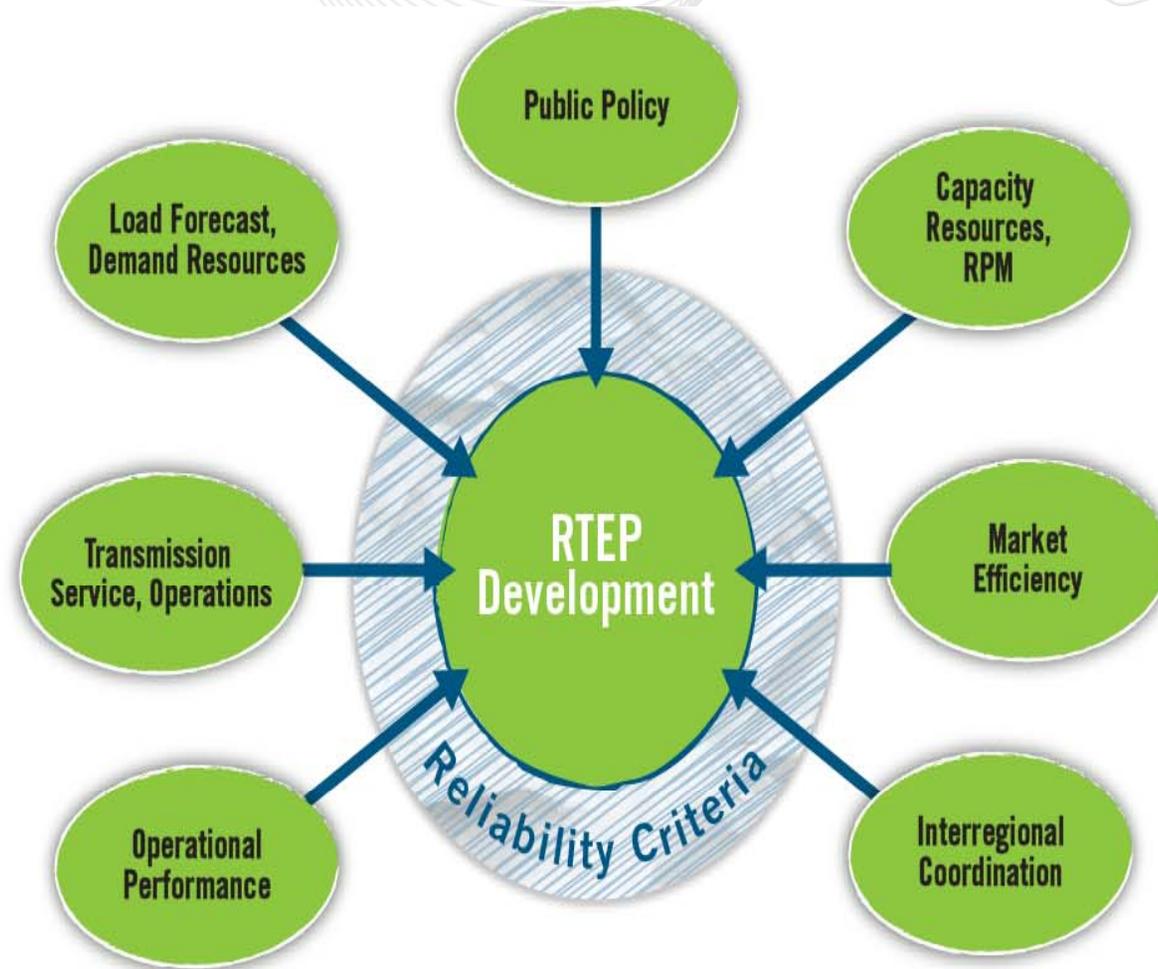
- Planning Drivers Need to be Transparent and Tariffed
- Planning Drivers:
  - Reliability,
  - Market Efficiency and
  - ‘Consideration’ of Public Policy
- Interregional Planning:  
‘Bottom Up’ Rather not ‘Top Down’



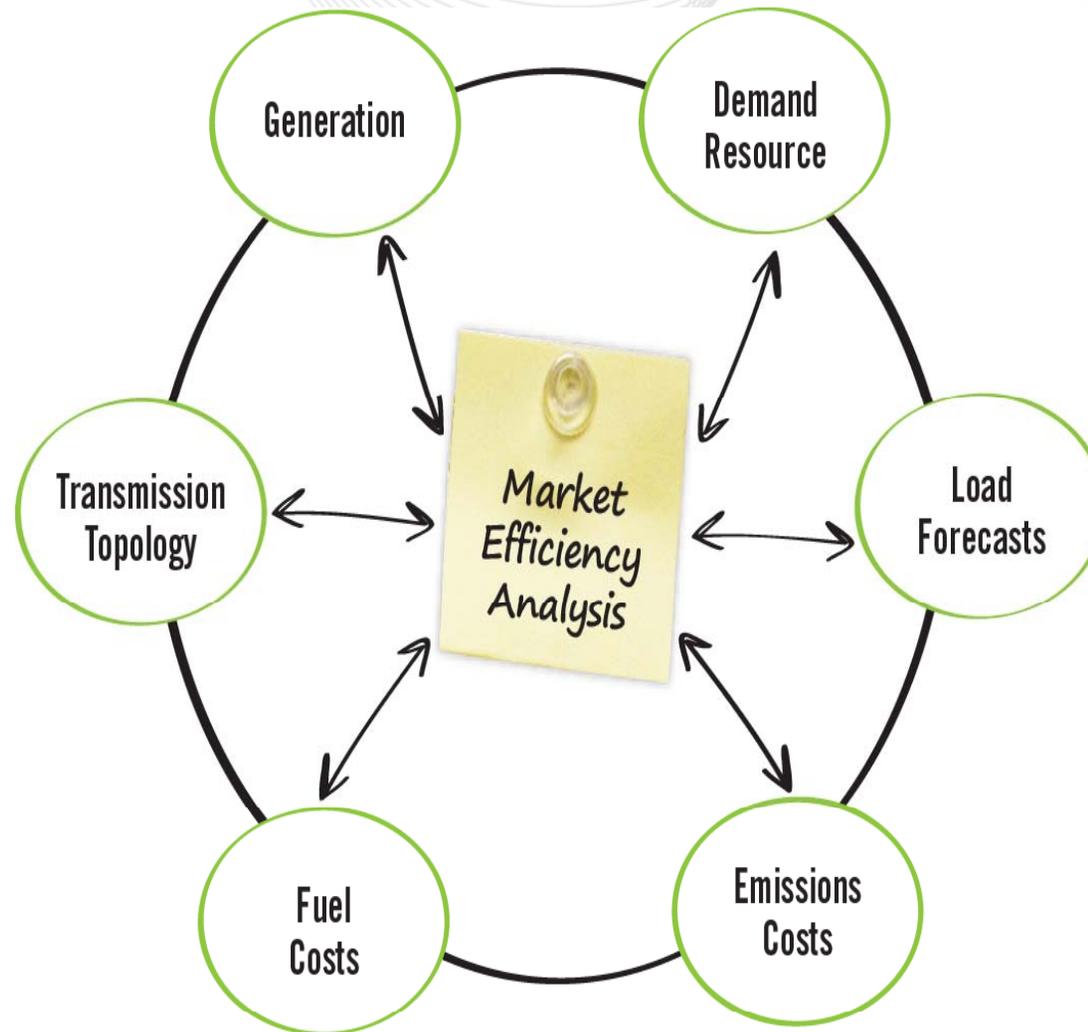


- Cost allocation must be 'commensurate with' benefits
- One region can veto a neighboring region's project if it does not provide them benefits
- Cost to Benefit Ratio Cannot Exceed 1.25
- Interconnection Wide Planning Not Directed...Bottom Up Approach with Coordination

# PJM's Transmission Plan Drivers



# Market Efficiency Analysis Parameters



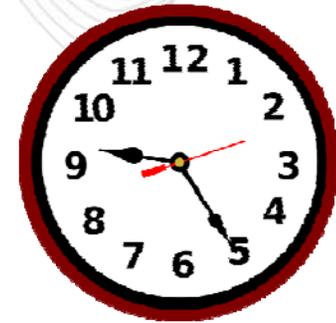


# An Overview of Interconnection-Wide Planning The Eastern Interconnection Planning Collaborative



- Historical Context
- EIPC Formation, Purpose, Structure and Scope of Activities
- Past EIPC Studies and Activities
- Current EIPC Studies
- Possible Future Directions
- The Path Forward

Turn back the clock to 2008 ...



- Then current challenges to the industry:
  - *Evolving energy policies (green/renewables)*—were driving the need to analyze transmission scenarios on a broad multi-regional and interconnection-wide scale
  - *Planning More Localized*—Transmission expansion plans in the Eastern Interconnection were developed and coordinated on a regional and super-regional basis, but were not fully coordinated on an interconnection-wide basis
  - *National Debate*—Proposals to mandate broader transmission planning were being debated at the federal level

- In the east, several Planning Authorities started a dialog to establish an interconnection-wide planning process for the coordinated roll-up and expansion of existing regional and system specific plans
- Those discussions evolved into the EIPC
- EIPC as an organization officially formed in 2009



- Develop an open and transparent process through an interactive planning dialogue with industry stakeholders
- Foster additional consistency and coordination in the Eastern Interconnection
- Provide an interface with other interconnections
- Provide policy makers and regulators with current and technically sound transmission planning information

- EIPC is a membership organization – members are NERC registered Planning Authorities (Planning Coordinators)
  - Current membership covers over 95% of the EI
- EIPC's members contribute their resources to the work that is undertaken and fund the EIPC budget
- EIPC maintains an interconnection-wide stakeholder process and supports regional stakeholder activities
  - Ensure broad dissemination of study results
  - Ensure transparency of study work
  - Seek input on future activities

- Modeling and developing input on regulation and policy issues from an interconnection-wide view
- Serve as a resource to facilitate analysis of FERC, DOE, and even State transmission policy issues, providing a broad interconnection view of the potential impacts resulting from possible regulations
- Focus on interconnection-wide (not regional) – similar to the role that WECC and ERCOT play

- Overview and analysis of regional transmission plans using an integrated model of the Eastern Interconnection
- Modeling to help explain broader interconnection-wide impacts and to provide policy makers and regulators with current and technically sound information
- Work closely with state and federal regulators on issues of interest to them

- Phase 1 – generation expansion plans under 8 different energy policy futures, with 72 sensitivity cases to show how policy drivers impact the future generation mix
- Phase 2 – transmission “build-outs” for three scenarios chosen by stakeholders
  - Scenario 1 – low carbon
  - Scenario 2 – regional RPS
  - Scenario 3 – “business as usual”

- Gas-Electric Interface
  - Target 1: Catalog of interstate natural gas pipelines and service to electric generators
  - Target 2: 2018 and 2023 analysis of interstate natural gas pipeline constraints when serving electric generators – frequency and duration
  - Target 3: Contingency analysis of pipeline failures and electric system failures to determine impacts on other infrastructure
  - Target 4: Economics of purchasing firm gas supply versus dual fuel

- 2015: Roll-up of 2025 Summer and Winter regional plans
- 2016: Scenario analysis using the 2025 cases
- Provide input to DOE QER version 2 effort
- Provide input to DOE Annual Transmission Data Report
- Development of a new, simplified approach to sharing CEII information for FERC Order 1000 and NERC MOD 32 purposes
- Development of an EIPC-reviewed production cost data base
- Continue interface with industry groups – e.g. EISPC and the new National Council on Electricity Policy
- Continue to support FERC staff

- Continued development of Roll-up cases
- Scenario studies based on stakeholder input
- More in-depth analysis of Roll-up cases, beyond power flow reliability studies, possibly to include production cost simulation and sensitivity analysis
- Study of an integrated model based on regional CPP compliance plans when state and regional directives are more clear
- Continue philosophy that interconnection-wide processes supplement regional planning requirements rather than attempt to replace them



## POLICY CHOICES...

### The Long and Winding Road...



- Transmission: Built to support major generation projects
- Connect distant generation to load;  
Distribution: One way delivery of power to the home
- Grid Costs: Rate-based to the home utility's customers
- ROI: Little focus on transmission as a stand alone business element

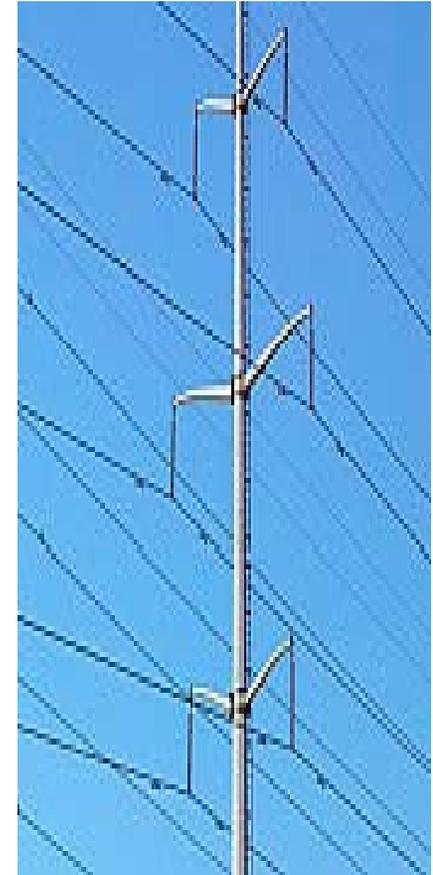


## Policy Choice #1

***Is the grid an enabler or a competitor?***

### Grid as an Enabler?

- Accept the grid as a natural monopoly
- Drive solutions through regulation
- Provide incentives for innovation



## *Policy Choice #1 (cont'd)*

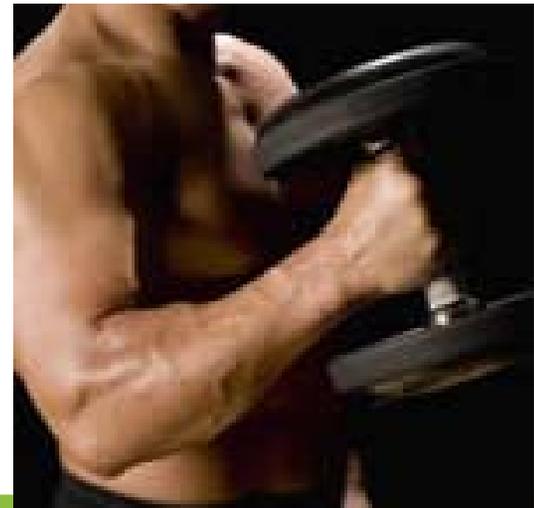
### Grid as a Competitor?

- Grid development must compete with generation or demand side
- Grid entrepreneurs take risk: no guaranteed ROI
- Grid pricing reflects competitive outcomes: Bid solutions into the marketplace (RPM)

## *Policy Choice #2: A Strong or Weak Grid?*

Characteristics of the “Strong” Grid:

- Generation distance from load
- Meet the needs for future transmission expansion
- Costs socialized to reflect interconnected nature of the grid
- Broad regional approach



## Policy Choice #2: The Alternative:

The localized grid...

- Generation closer to load
- Centralized focus on development of DSR, energy efficiency and renewables
- Transmission/distribution grid as an enabler of alternative generation
- Transmission focused on meeting state/local needs



## *Policy Choice #2: Decision Points*

- Siting: Regional vs. Local Needs
- Cost Allocation: Socialization vs. Direct Assignment
- IRP/RPS vs. Competitive Procurement
- Short term procurement vs. long term



## Policy Choice #3: Determine the Planning Philosophy

- Transmission decisions driven by generation investment or generation investment influenced by the planned transmission grid?
- Role of the Planning Authority



An Added Complication:

*Who Decides?*



- States:
  - State Energy Policies: Governors/legislators
  - State PUCs
- FERC
  - FERC Review of Planning
    - Who chooses projects?
- Environmental Agencies
  - Non-attainment areas
  - RGGI et al.





LET'S TALK...



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