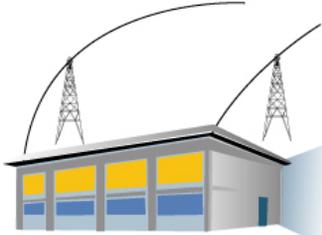




Order 890 FERC Technical Conference

June 28-29, 2007
Pittsburgh, PA

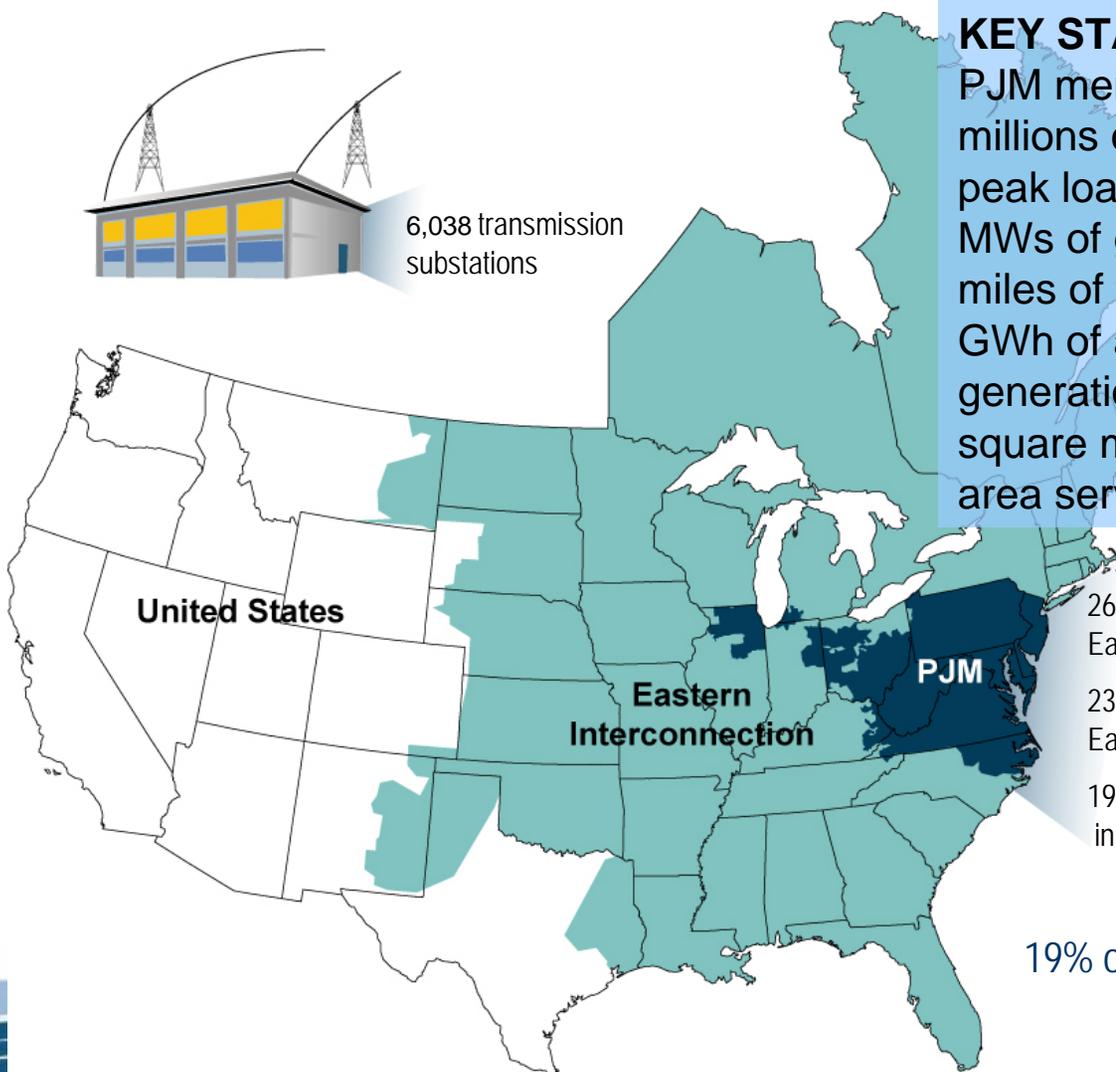
Steven R. Herling
Vice President, Planning
PJM Interconnection, L.L.C.



6,038 transmission substations

KEY STATISTICS

PJM member companies	400+
millions of people served	51
peak load in megawatts	145,000
MW of generating capacity	165,000
miles of transmission lines	56,070
GWh of annual energy	700,000
generation sources	1,271
square miles of territory	164,260
area served	13 states + DC

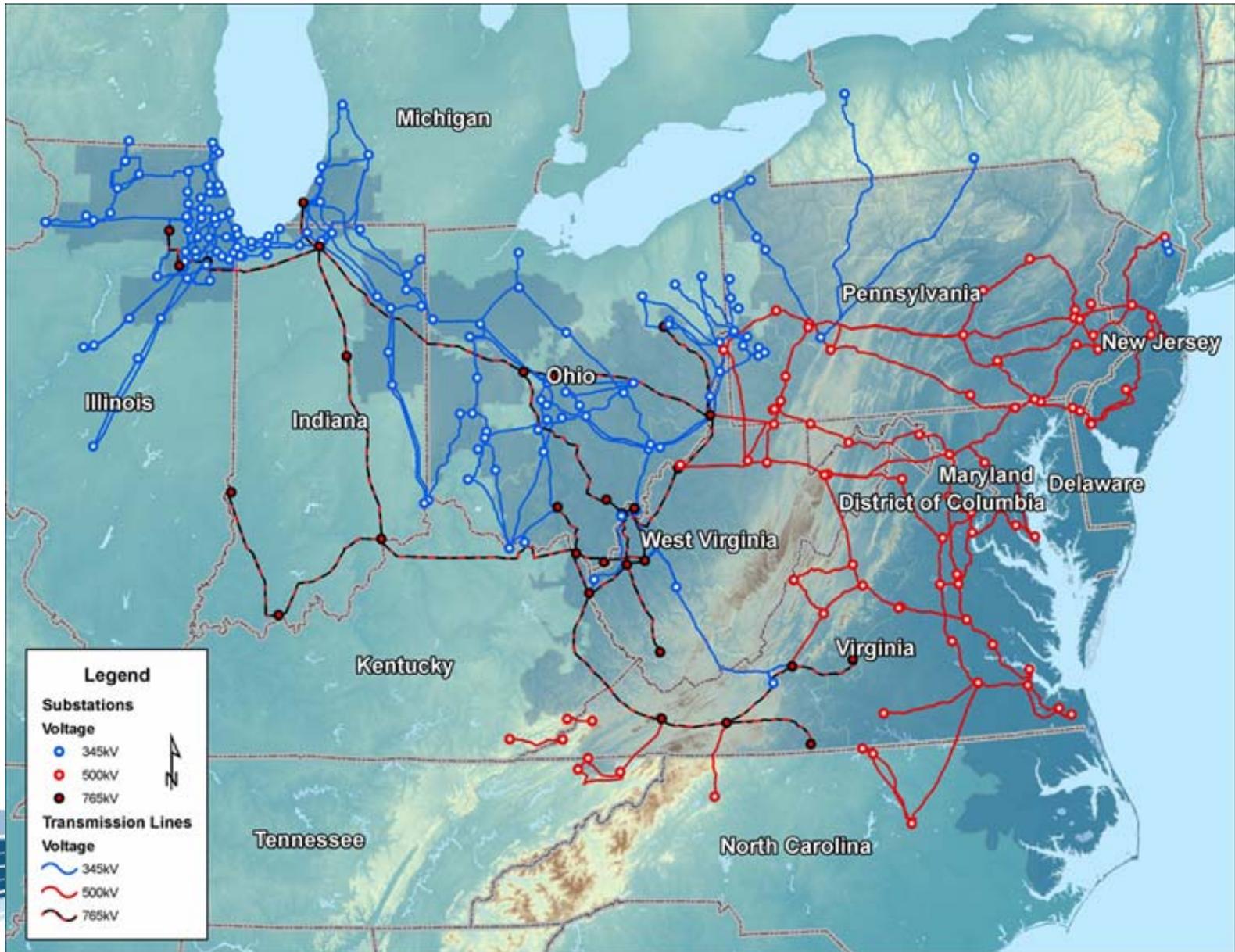


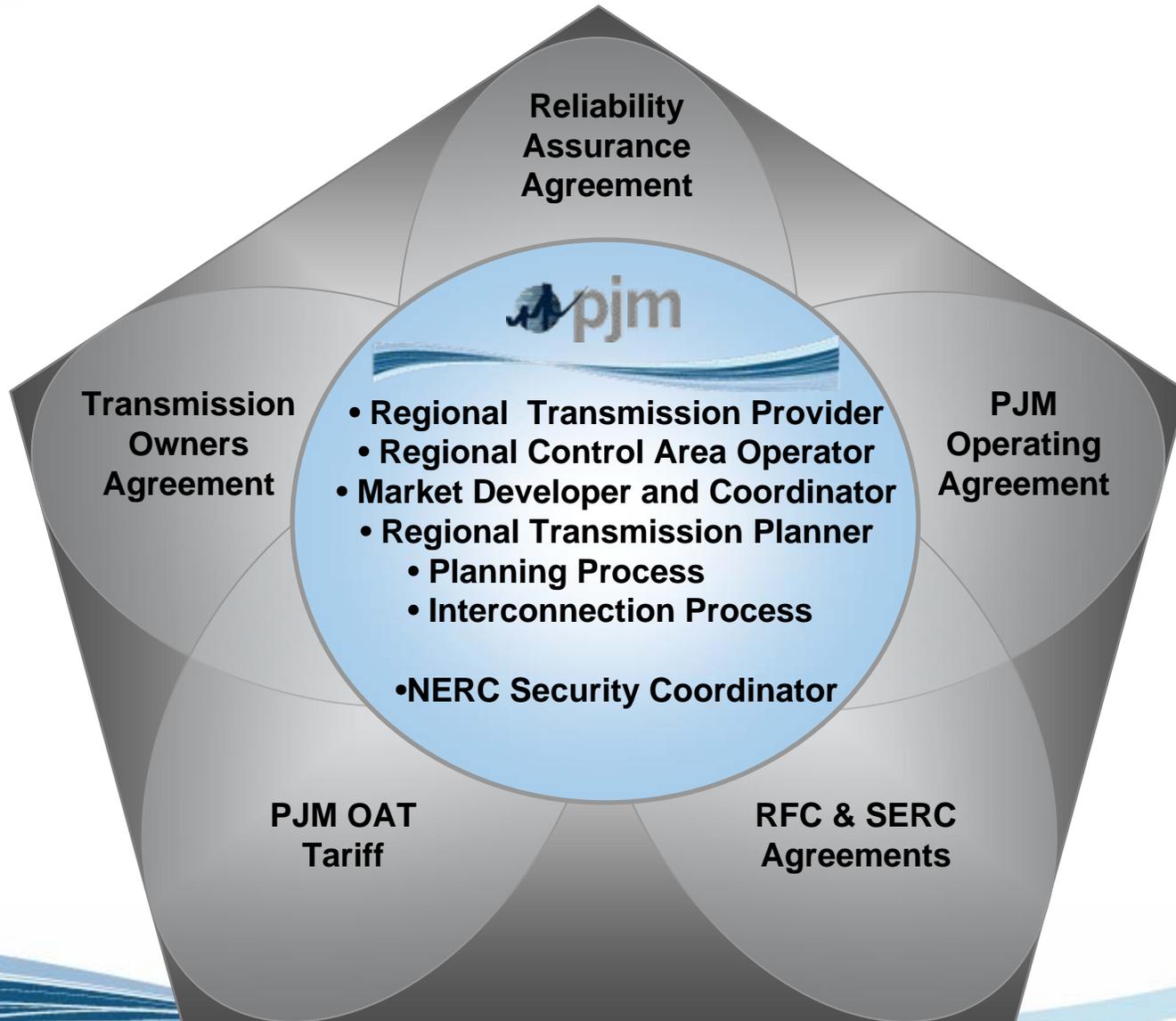
26% of generation in Eastern Interconnection

23% of load in Eastern Interconnection

19% of transmission assets in Eastern Interconnection

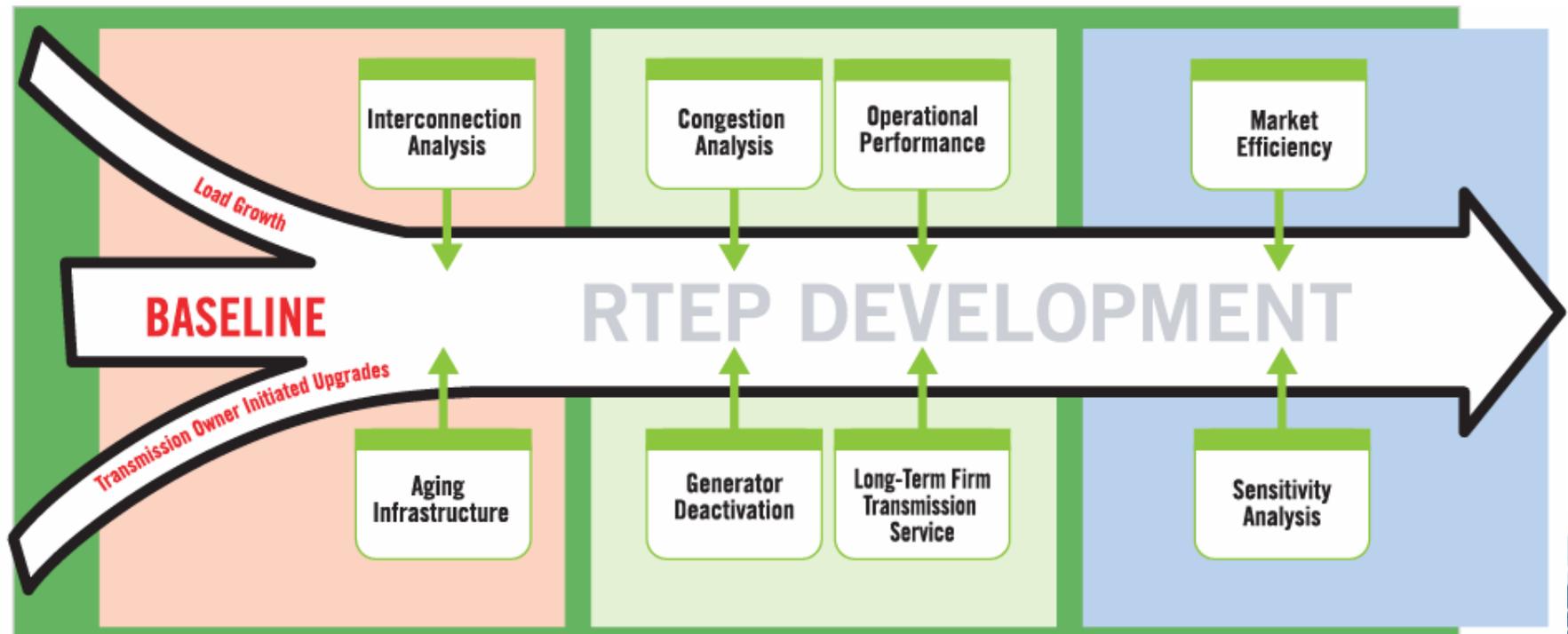
19% of U.S. GDP produced in PJM





- **Inclusive Regional Planning Process**
 - Integrate all needs and all solutions
 - Stakeholder involvement
 - State focus
- **Integrated Planning, Markets, and Operations**
- **Comprehensive Infrastructure Management**
 - Single entity decision-making – Ignore internal boundaries

- Ongoing and cyclical
- 15 year planning horizon
- Comprehensive and Holistic
- Collaborative



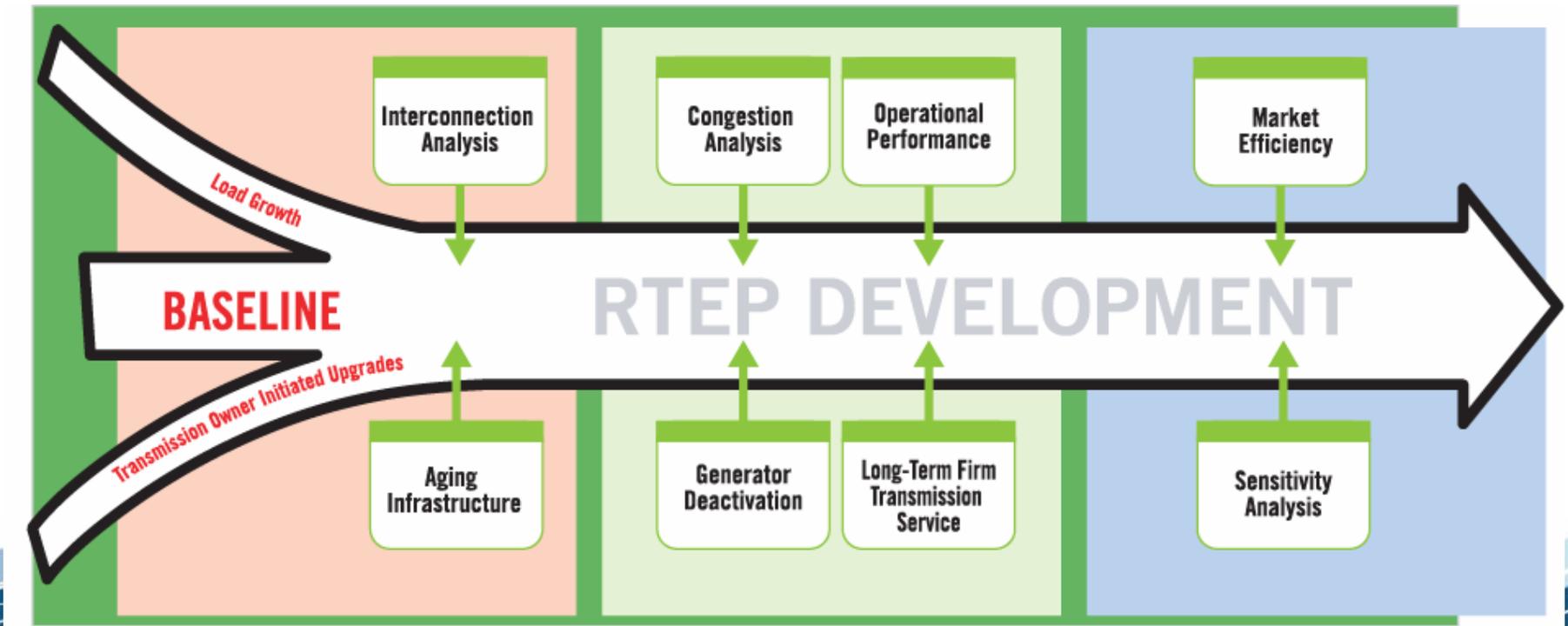
- Load and Energy Forecast Developed by PJM for Ten Year Period
 - Local Historical Weather and Load Data
 - Local Econometric Forecasts
- Basis for Reliability and Market Efficiency Analysis

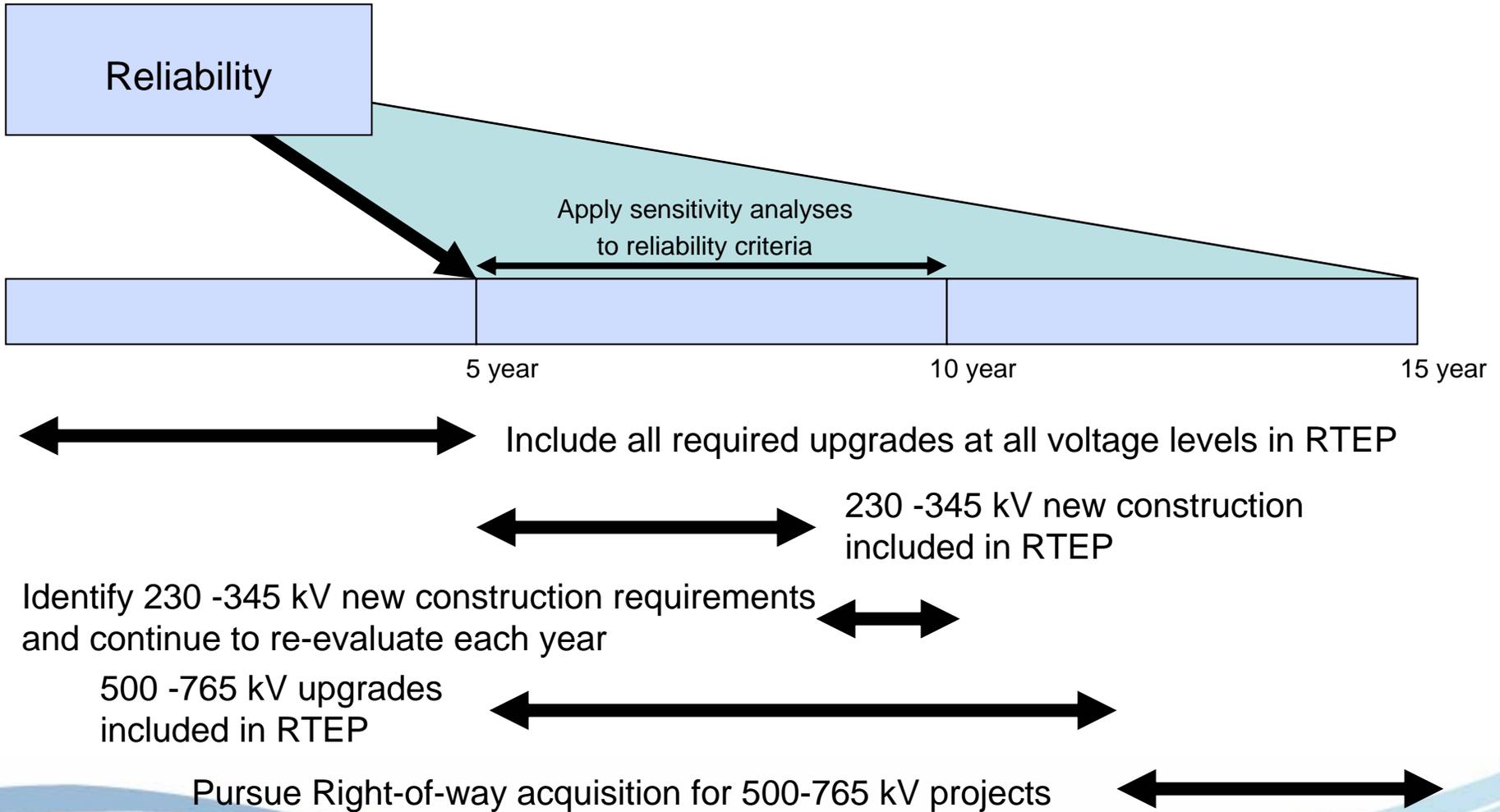


Note: Projects May Drop Out of the Queue at any Time

- Received over 900 interconnection requests since 1997
- Received requests to interconnect over 200,000 MW since 1997
- PJM coordinated system enhancements will accommodate over 23,000 MW of new generation by 2012

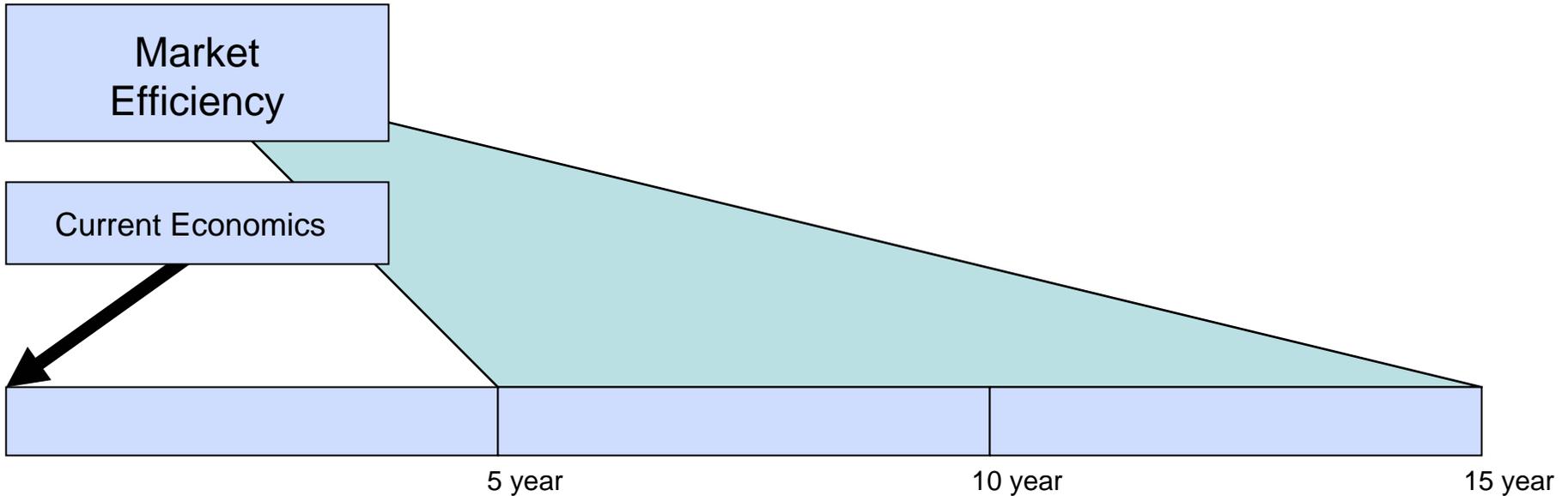
- The 15-year planning scope involves:
 - Reliability Analysis
 - Reliability-based Sensitivity Analysis
 - Market Efficiency Studies





- Reliability Criteria
 - North American Electric Reliability Council (NERC) Standards
 - ReliabilityFirst (RFC), SERC Criteria
 - PJM Criteria
 - Load deliverability (CETO / CETL)
 - Generator deliverability
 - Transmission Owner Local Criteria
- Power flow simulations
 - Thermal analysis
 - Voltage analysis
 - Short Circuit analysis
 - Stability analysis

- **Market Facilities**
 - Evaluated for Reliability per Attachment G in M -14B
 - Under PJM Congestion Management Control
- **Reliability Only Facilities**
 - Facilities that meet the BES definition but are not under PJM congestion management control
 - Must be tested for compliance with NERC TPL-001, TPL-002, TPL-003 and TPL-004 standards
 - Evaluation and analysis done as part of the RTEP

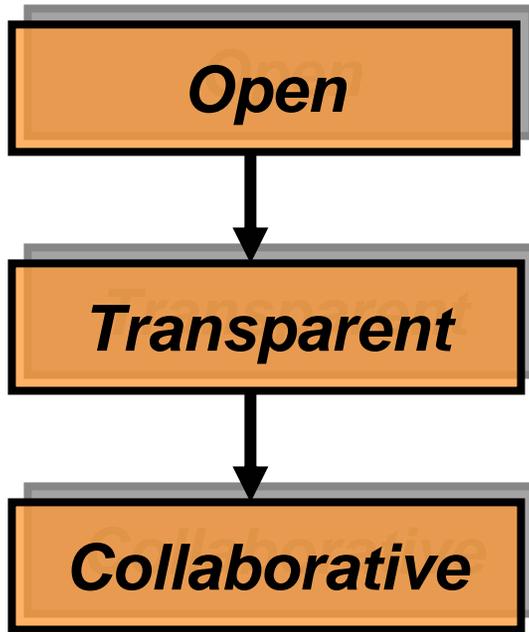


Core economic analyses related to:

- Production cost
- Transmission congestion
- Other econometric factors

Evaluate additional infrastructure requirements based on impact of market efficiency analysis assumptions

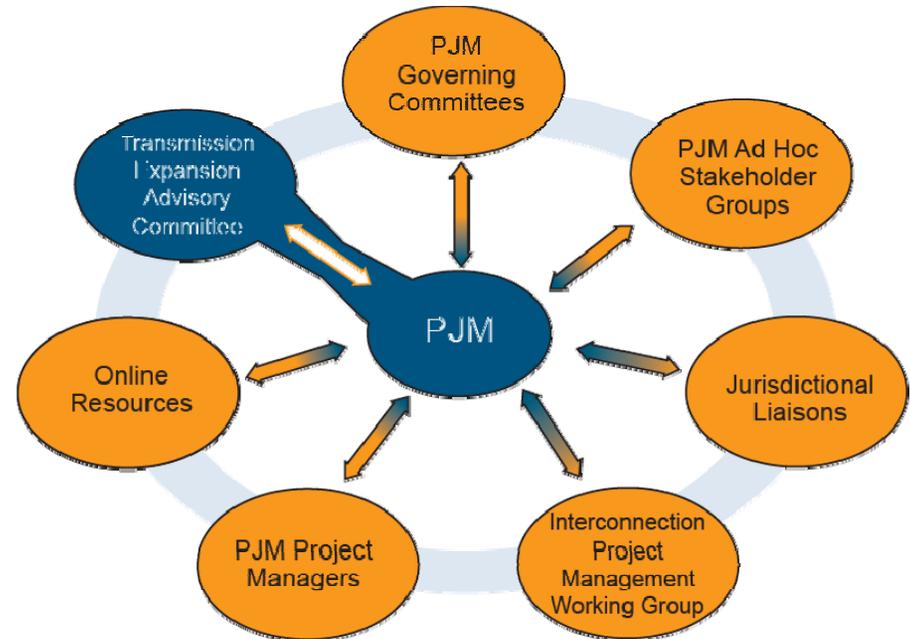
TEAC recommends scope of analysis and assumptions, reviews results, and makes recommendations to the Board

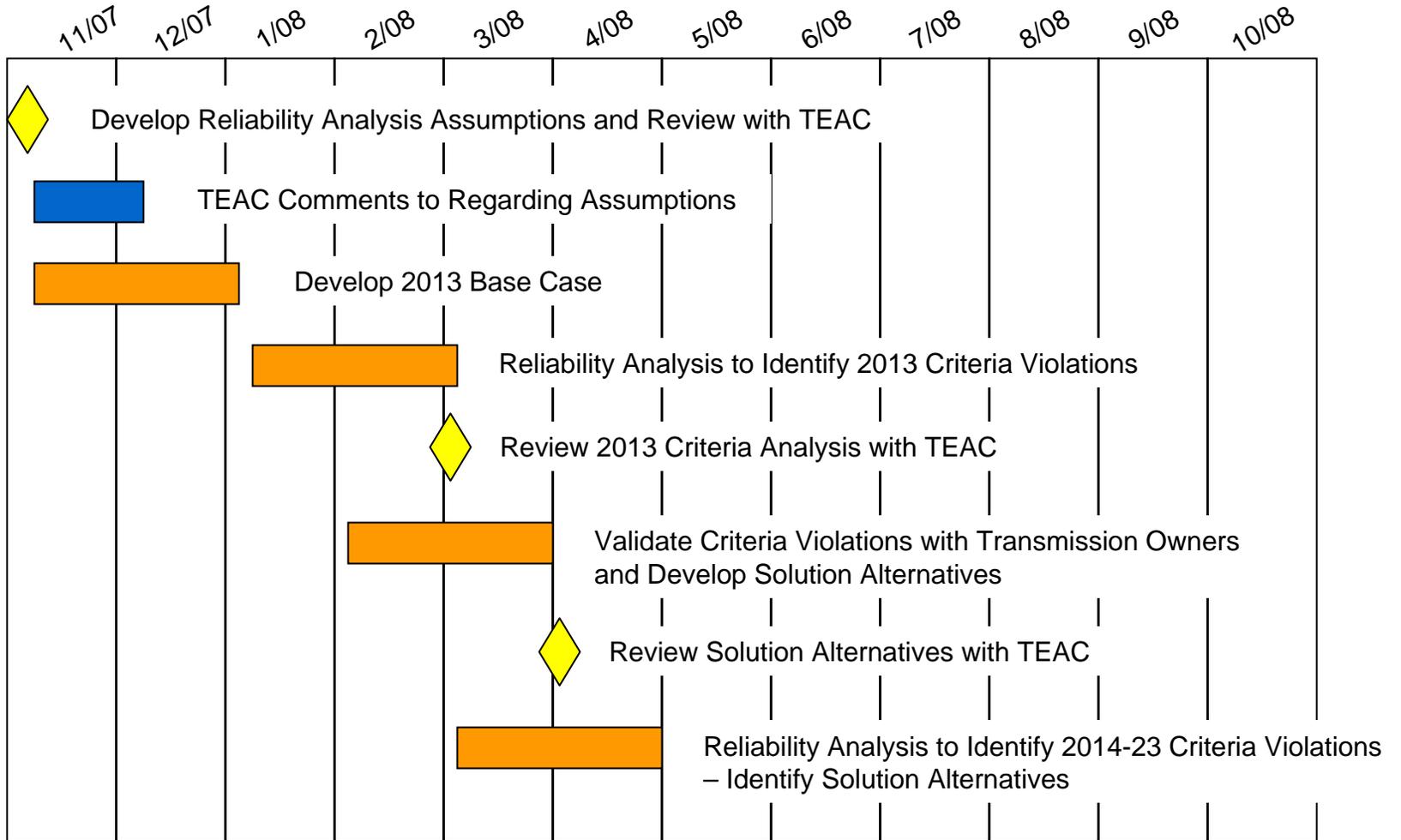


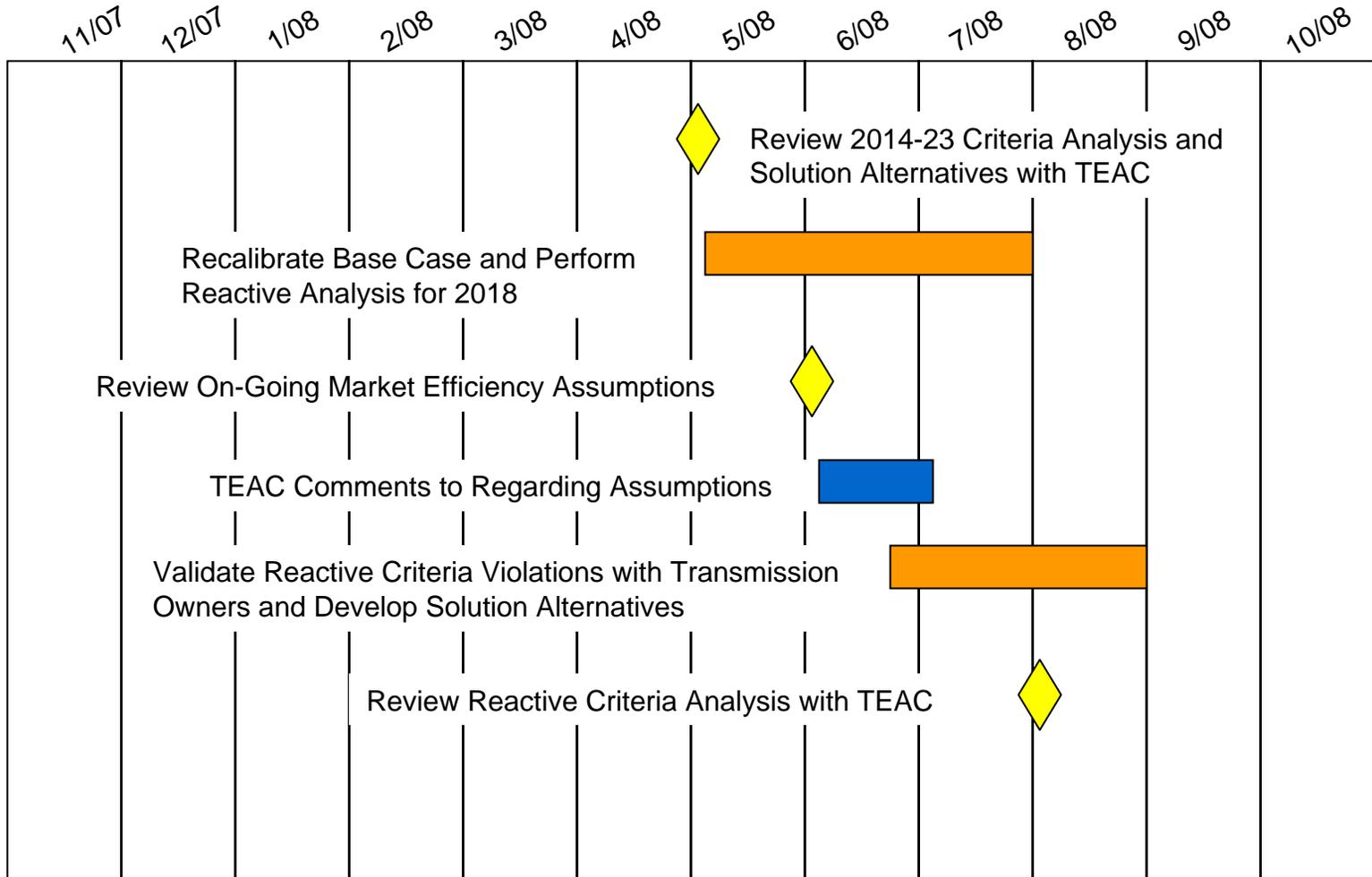
- RTEP process based on three key elements
 - Openness
 - Transparency
 - Collaborative input
- This process provides all stakeholders the opportunity to fully participate in the improvement of the overall grid
- Stakeholders can provide input and participate in the RTEP process through the Members Committee, Planning Committee, or the Transmission Owners Agreement Administrative Committee

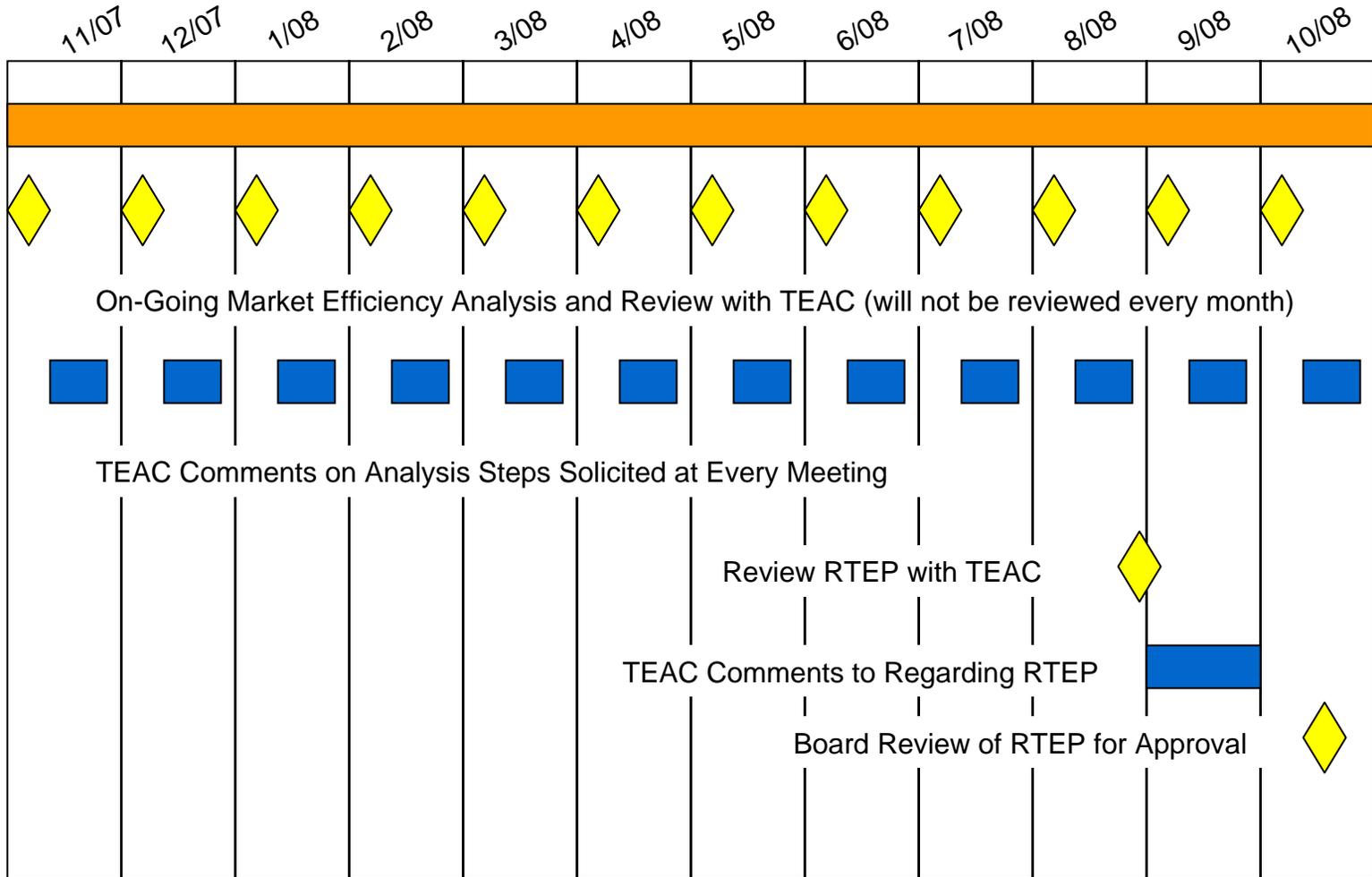
Transmission Expansion Advisory Committee (TEAC)

- Input on analysis assumptions
- Review of reliability and market efficiency results at defined points of the RTEP Process
- Review of recommendations going to the PJM Board or as requested by the PJM Board itself
- Formal comment process with written comments to Board





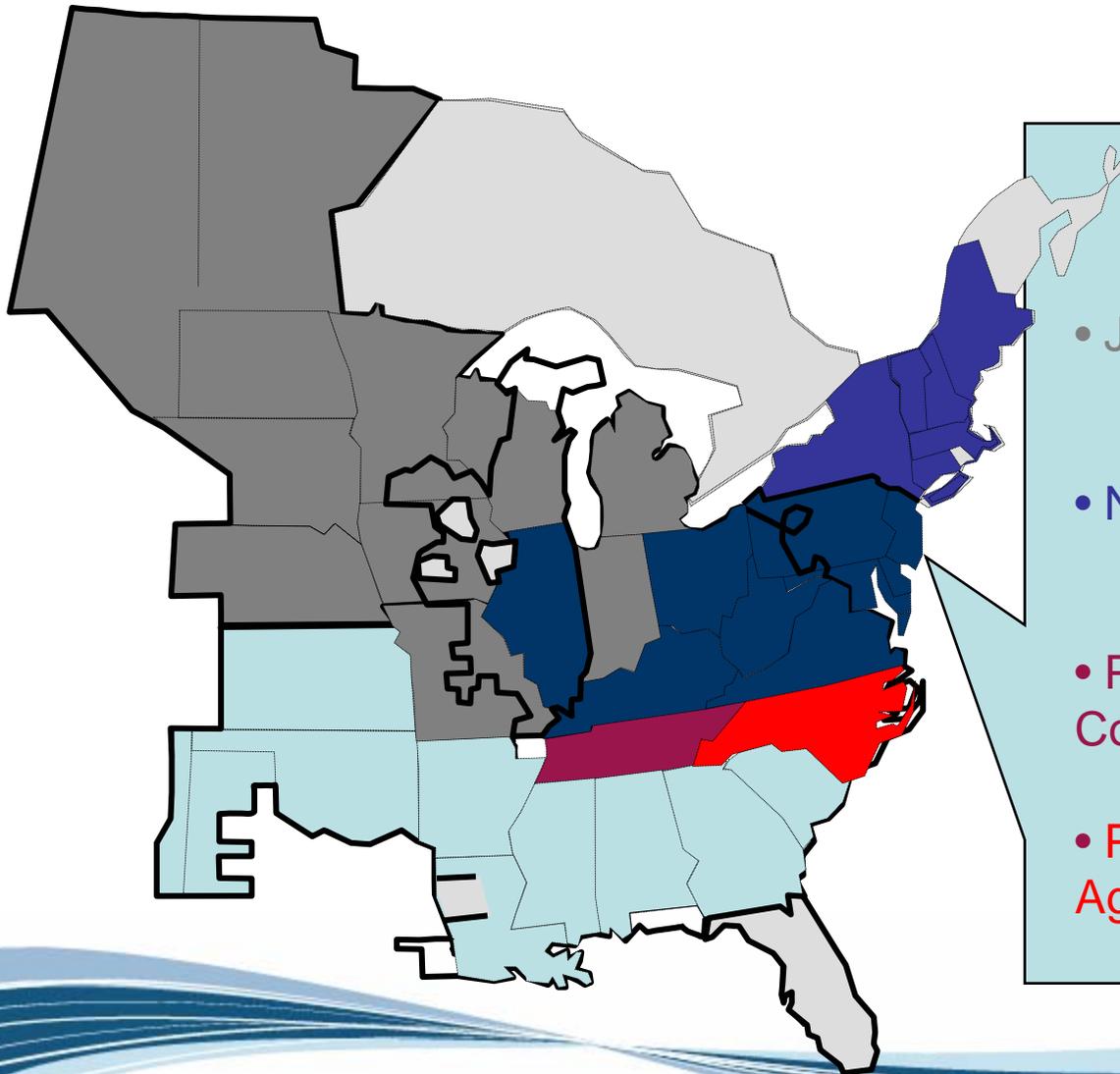




\$ 7.2 Billion → Transmission additions & upgrades approved by the PJM BOM since 1999

\$ 6.5 Billion → Baseline transmission upgrades fundamentally to ensure reliability.

\$ 680 Million → Transmission upgrades to accommodate more than 23,000 MW of new generation, and over 1,000 MW of capability by new merchant transmission facilities



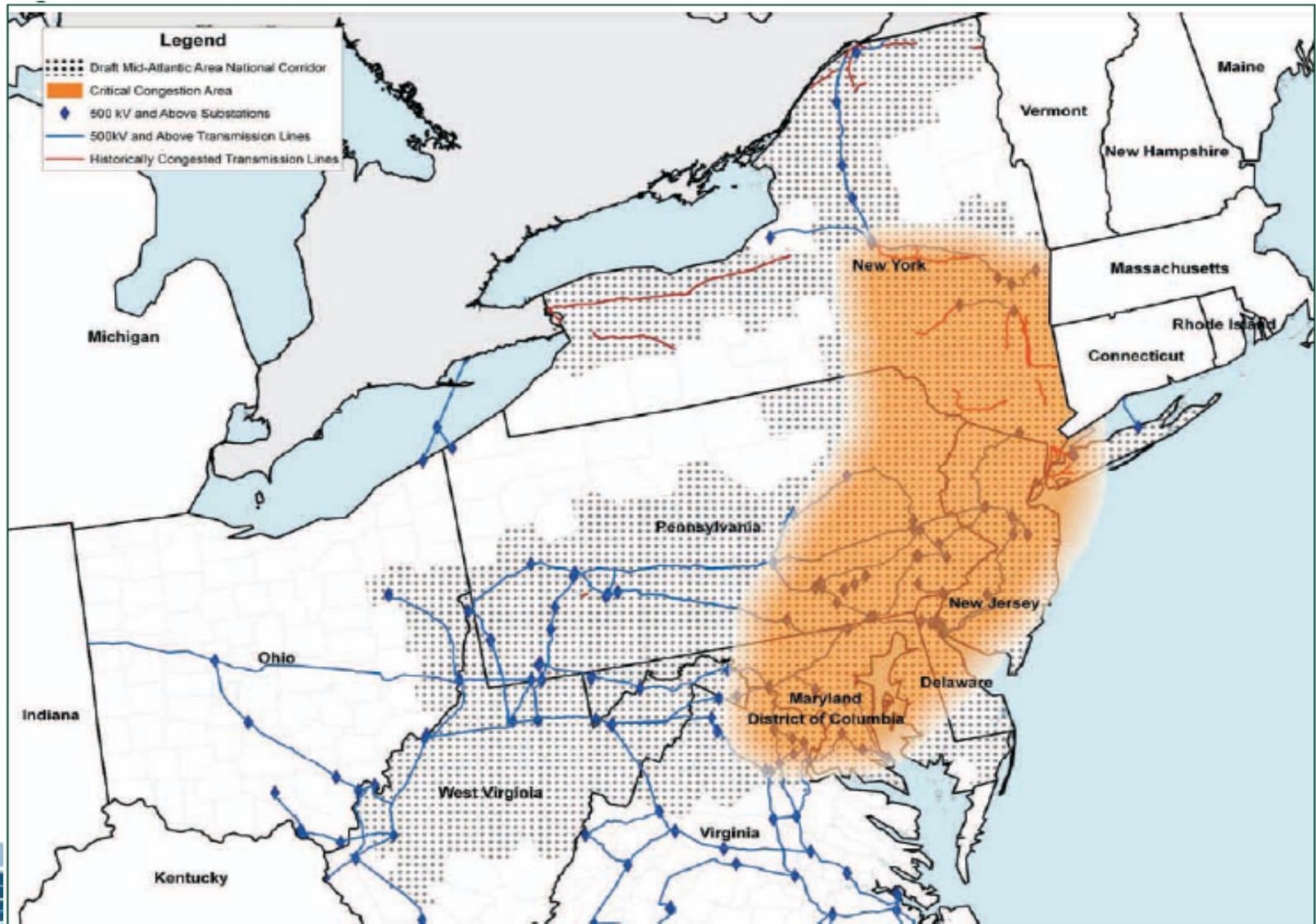
Coordinated Regional System Planning

- Joint Operating Agreement- PJM and MISO
- Northeast Planning Protocol- PJM, NY, NE
- PJM/MISO/TVA Joint Coordination Agreement
- PJM/PEC Joint Operating Agreement

	Data Coordination	Case Development	Coordinate Operational Analysis	Coordinate Planning Analysis	Coordinate Planning Solutions	Cost Allocation
PJM/MISO	X	X	X	X	X	X*
PJM/NY/NE	X	X	X	X		
PJM/TVA	X	X	X	x		
PJM/Progress	X	X	X	x		

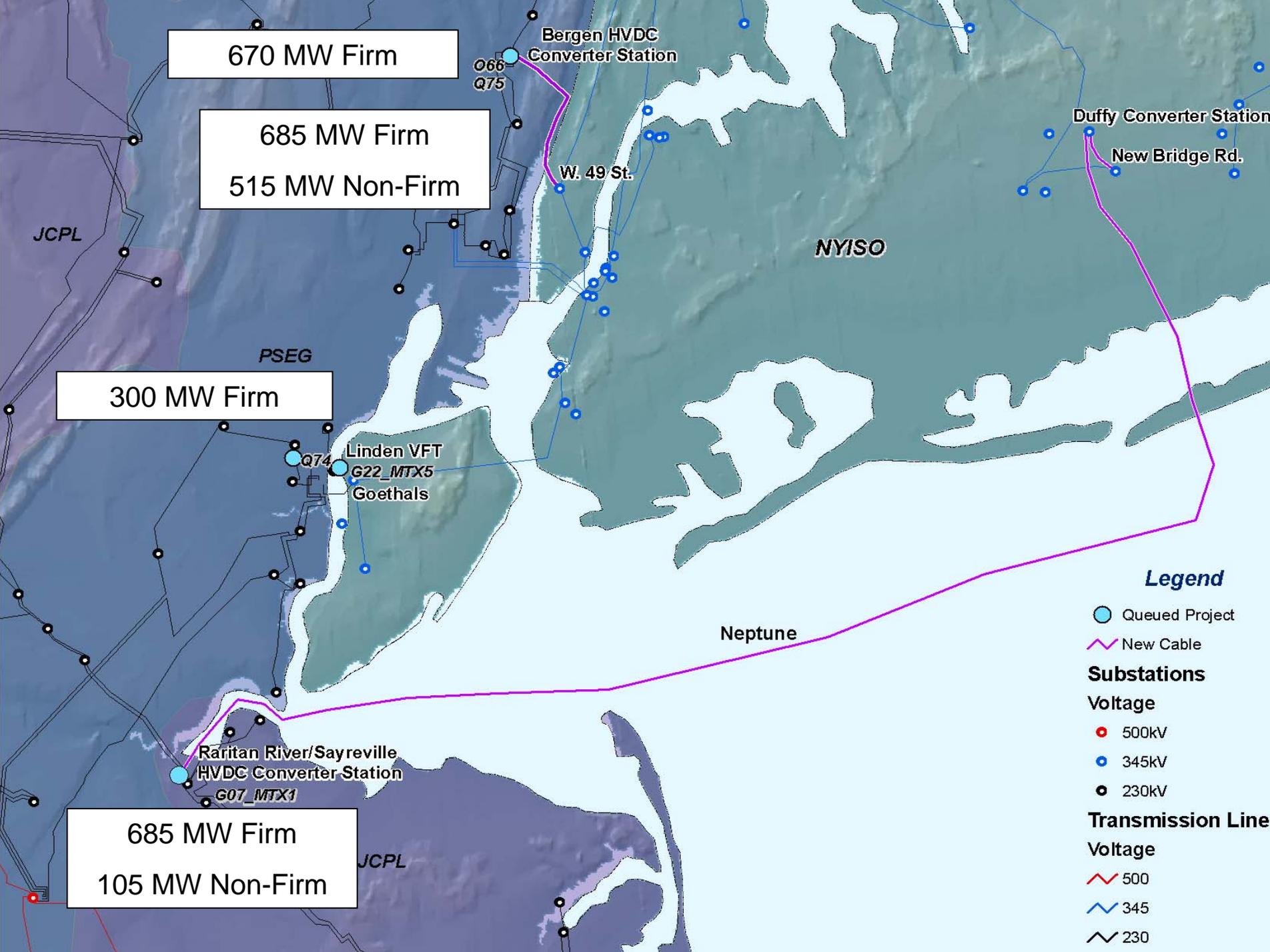
- MISO and NY/NE Agreements
 - Establish Joint Planning Committee to Coordinate Analyses
 - Establish Joint Planning Stakeholder Advisory Committees
- 2006 Analyses
 - PJM/NY/NE
 - Loss of Source Analysis
 - Resource Adequacy Analysis
 - Fuel Diversity Analysis

- 2006 Analyses
 - PJM/MISO
 - Generation Deliverability Analysis
 - N-2 Analysis
 - Combined Market Deliverability
- On-going Analyses
 - Developing Scope for 2007-2008 Analyses



Note: County boundaries are shown.

Source: U.S. Department of Energy, 2007.



670 MW Firm

685 MW Firm
515 MW Non-Firm

300 MW Firm

685 MW Firm
105 MW Non-Firm

Bergen HVDC Converter Station

Duffy Converter Station
New Bridge Rd.

JCPL

NYISO

PSEG

Linden VFT
G22_MTX5
Goethals

Neptune

Raritan River/Sayreville HVDC Converter Station
G07_MTX1

JCPL

Legend

Queued Project

New Cable

Substations

Voltage

500kV

345kV

230kV

Transmission Line

Voltage

500

345

230

- Coordination
- Openness
- Transparency
- Information Exchange
- Comparability
- Dispute Resolution
- Regional Participation
- Economic Planning Studies
- Cost Allocation for New Projects