Electric System Planning in New York & the Northeast

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Harvard Electricity Policy Group
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Outline

- **General Planning Principles**
- **NYISO's Comprehensive System Planning Process (CSPP)**
  - *Reliability (CRPP)*
  - *Economics (CARIS)*
- **Inter-Regional Planning Issues & Initiatives**

General Planning Principles

Levels of Planning

- ISO/RTOs perform and coordinate their planning efforts at several different levels:
  - *Regional Planning within our individual footprints*
  - *Inter-regional planning under coordination agreements with our neighbors*
  - *Coordinated Inter-regional planning required by NERC & Regional Entities*
  - *Broader coordination across all ISO/RTO regions to share information on issues of common interest through the IRC Planning Committee*

ISO/RTO Regional Planning: Common Principles*

1. **Independent analysis performed by ISO/RTOs**
2. **Includes both reliability & economic components**
3. **Open & transparent stakeholder process**
4. **Market-based solutions**
5. **Consider all resources**
6. **Regulated backstop solutions—if needed**
7. **Independent ISO/RTO Board approves final Plan**

* ***See ISO/RTO Electric System Planning Report, IRC Planning Committee, February 2006***

NYISO Comprehensive System Planning Process

NYISO Planning

- **NYISO is the transmission service provider for the New York Control Area in accordance with its FERC-approved OATT**
- **NYISO administers a Comprehensive System Planning Process (CSPP)**
  - ***Reliability (CRPP)***
  - ***Economic (CARIS)***
- **NYISO administers the interconnection process for all generation and transmission interconnections in New York**

Market-Based Approach

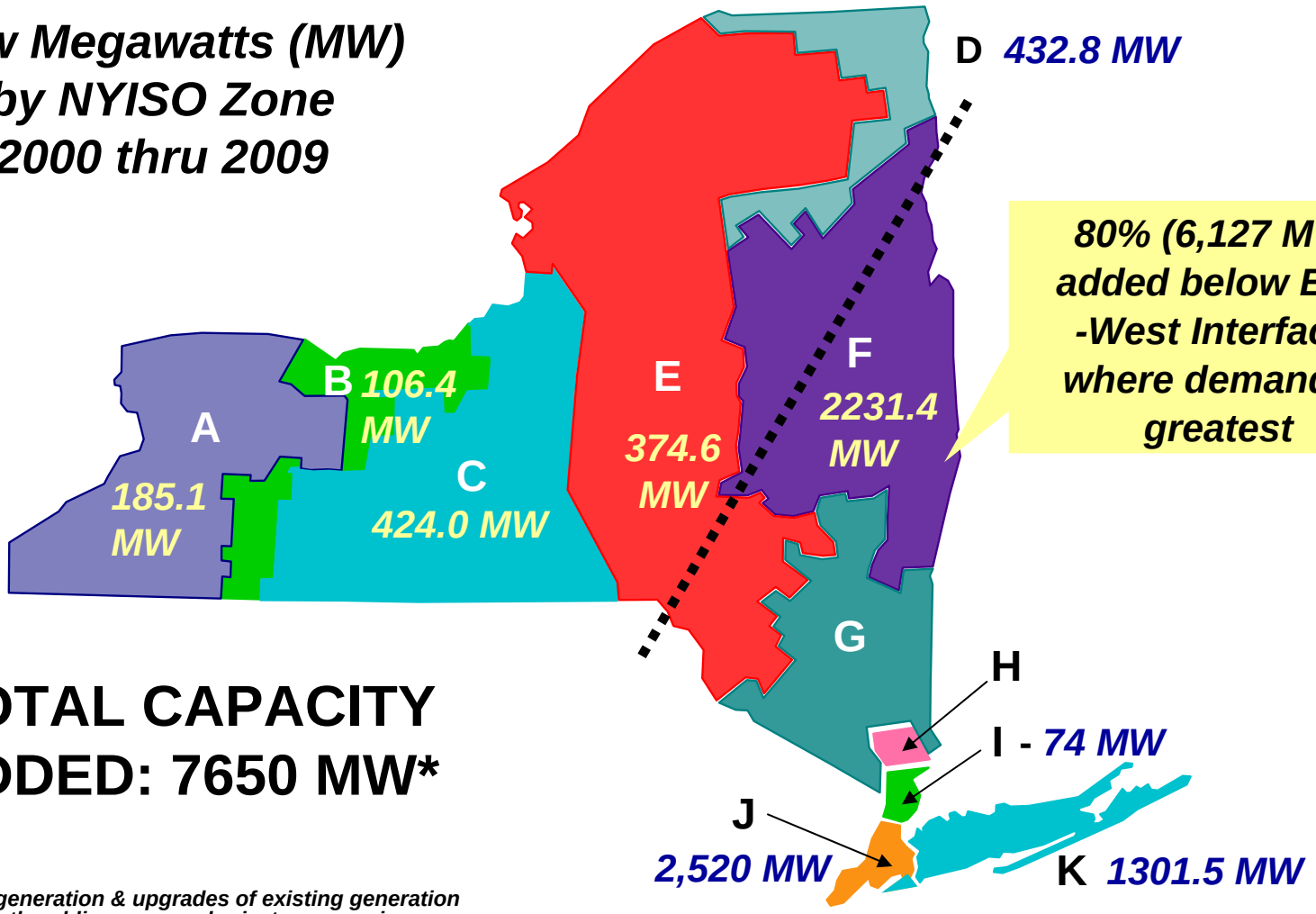
- **NYISO planning was established with a commitment to markets and strives to achieve market-based solutions when possible**
  - ***Market design & rules***
  - ***Planning process***
- **This approach has been generally supported by the NYS PSC and most other stakeholders and market participants**
  - ***NYISO utilizes an open and transparent process for stakeholder participation***
- **NYISO markets and LMP pricing signals provide the benefits of competition while achieving the intended results**
  - ***Except for wind power, almost all of the new merchant generation & transmission has been built or is proposed for development in Eastern and Southeastern NY***

Markets at Work in NY

- **Wholesale electricity prices - adjusted for fuel costs – declined**
  - ***If the cost of fuel used to generate electricity were the same today as it was in 2000, wholesale electricity costs would have dropped by 18% -- $2.2 billion in savings on a current annual basis***
- **New generation and interstate transmission added**
  - ***More than 7,600 MW of new generation built by public power and private suppliers, with 80% sited where demand is greatest (New York City, Long Island, and the Hudson Valley)***
  - ***Nearly 1,000 MW of transmission added to bring more power from out-of-state***
- **Power plant efficiency and availability improved**
  - ***System-wide heat rate of fossil-fueled generation improved 21%***
  - ***Average plant availability increased from 87.5% (1992–1999) to 94.7% (2001–2007), adding 2,400 MW -- the equivalent of four medium-sized power plants***
- **Reliability strengthened**
  - ***Surplus capacity to cover summer peak has increased. In 2000, there was a deficit of 1200 MW. In 2009, there is a surplus of 916 MW***
- **Renewable "green power" resources increasing**
  - ***There are over 1,200 MW of wind generation in operation and more than 8,000 MW proposed for grid connection***
- **Demand-side innovations fostered**
  - ***More than 2,100 MW now available from Demand Response programs that provide incentives for electricity customers to reduce their power use during times of peak demand***

New Generation

New Megawatts (MW) by NYISO Zone 2000 thru 2009



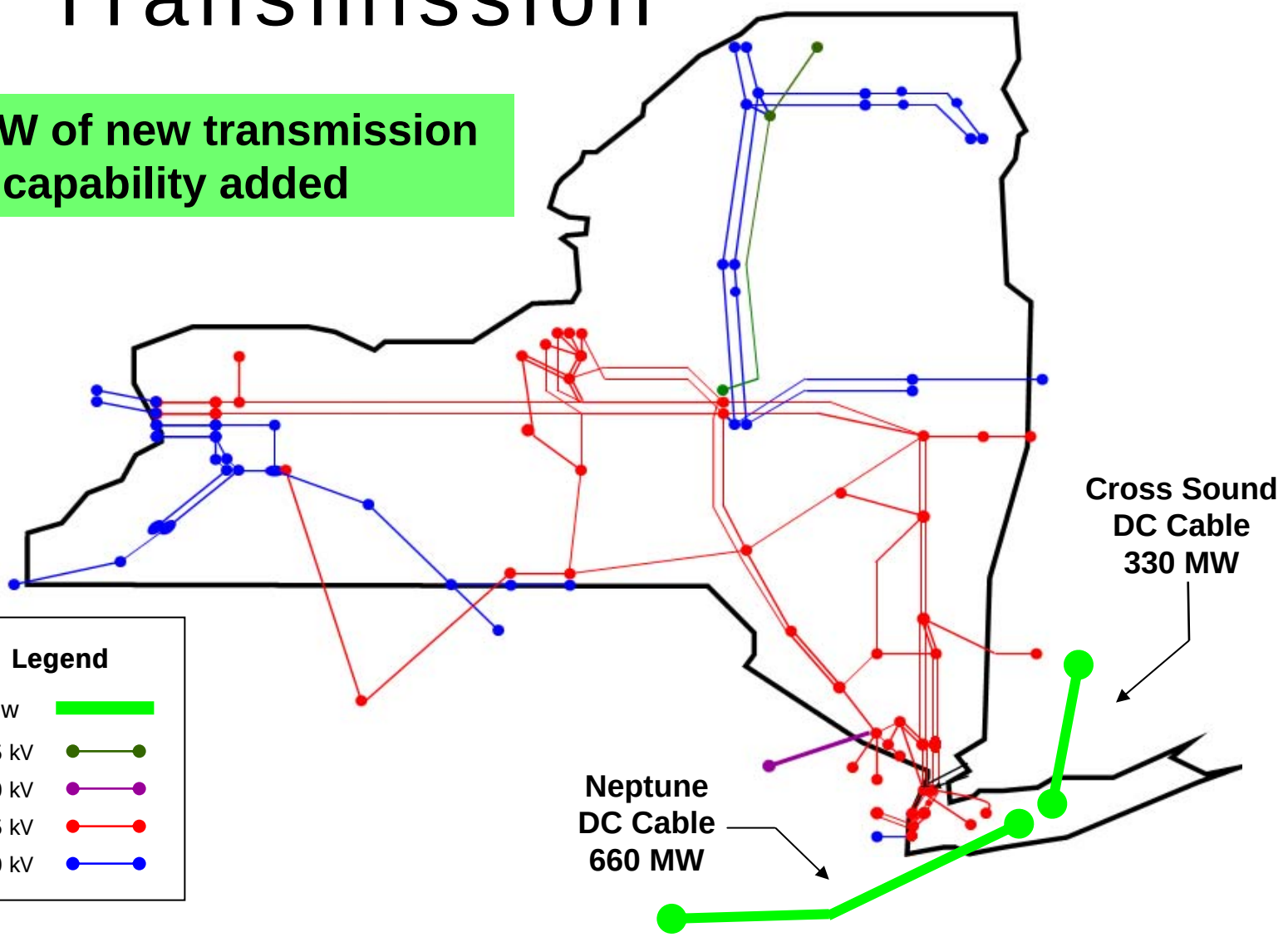
80% (6,127 MW) added below East -West Interface, where demand is greatest

TOTAL CAPACITY ADDED: 7650 MW*

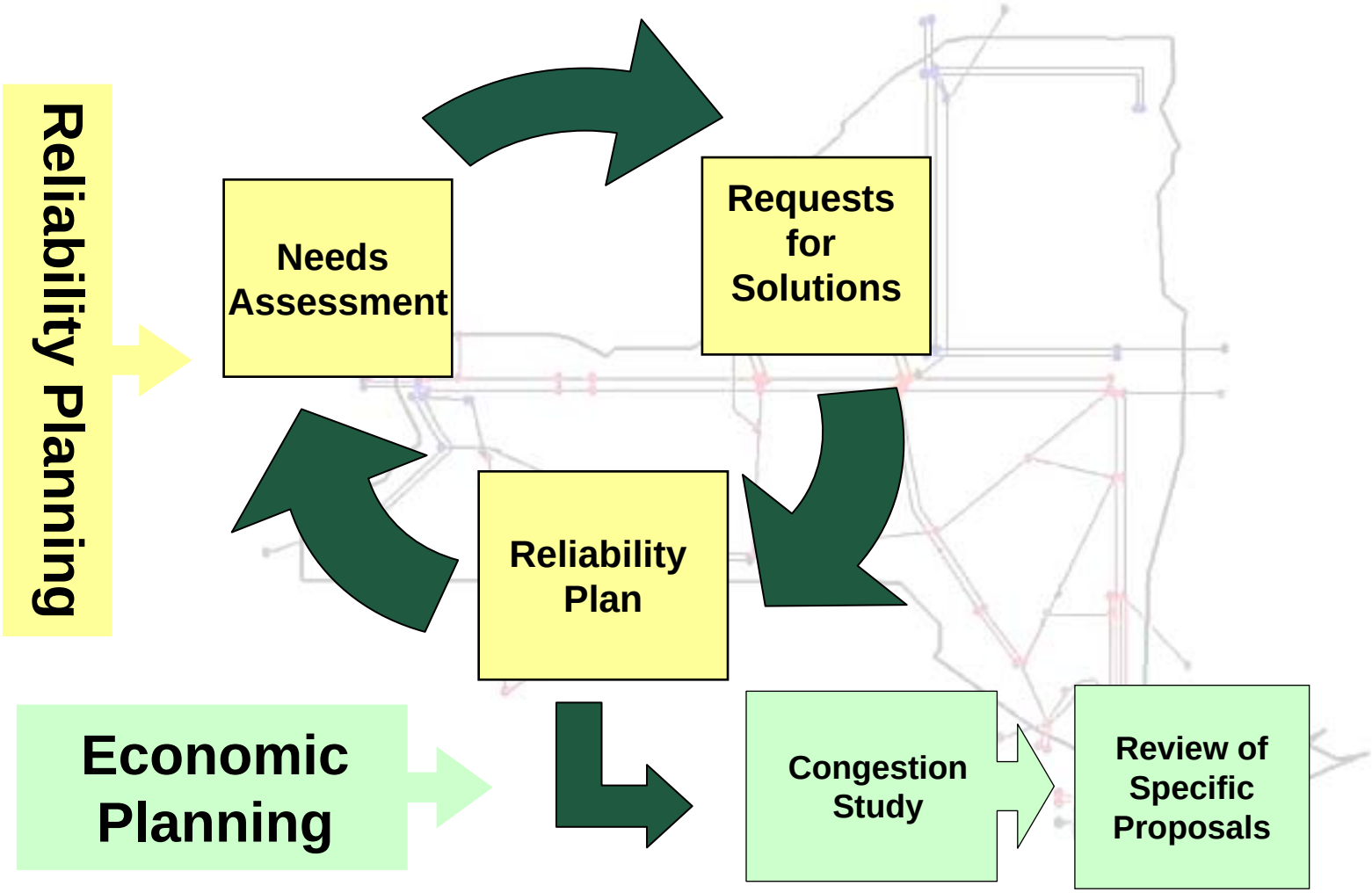
** Includes new generation & upgrades of existing generation developed by both public power and private companies*

New Transmission

990 MW of new transmission capability added



NYISO Planning



NYISO Planning

- **Multi-phased approach**
  - ***Phase I: Reliability Needs (CRPP)***
  - ***Phase II: Economic Considerations (CARIS)***
- **Anchored in NYISO's market-based philosophy**
- **CRPP**
  - ***Approved by FERC in December 2004***
- **FERC found the NYISO CRPP:**
  - ***to "…properly balance.." consideration of market-based and regulated solutions; and that***
  - ***"It is certainly a substantial improvement over planning processes that have traditionally depended upon TO-developed regulated solutions."***

Comprehensive Reliability Planning Process (CRPP)

- **A formal, transparent, long-term (10-year) planning process for the NYISO**
  - ***Provides for both market-based & regulated backstop solutions***
    - **All resources are considered on a comparable basis (Transmission, Generation & Demand Response)**
    - **Preference is given to market-based solutions**
  - ***Addresses roles of NYISO, FERC and NYS PSC***
  - ***Addresses cost allocation and cost recovery issues***
  - ***Provides a commitment to investigate cause of potential market failure and to modify market rules as needed***

NYISO Response to Order 890

- **Local Transmission Owner Planning Process**
  - ***As input to the NYISO planning process***
- **Economic Planning**
  - ***Congestion Analysis and Resource Integration Study (CARIS)***
- **Cost Allocation**
  - ***For both reliability & economic projects***

CARIS – Phase 1
Study Phase - 2009

Base Case Assumptions:

Most recently approved CRP

May 19 2009

Congestion Assessment: Historic and 10-year forecast

Identification of three most congested Paths/Elements

May-June 2009

Cost/Benefit Analysis

Three studies selected and agreed upon by stakeholders

Additional studies paid for by stakeholders

July - August 2009

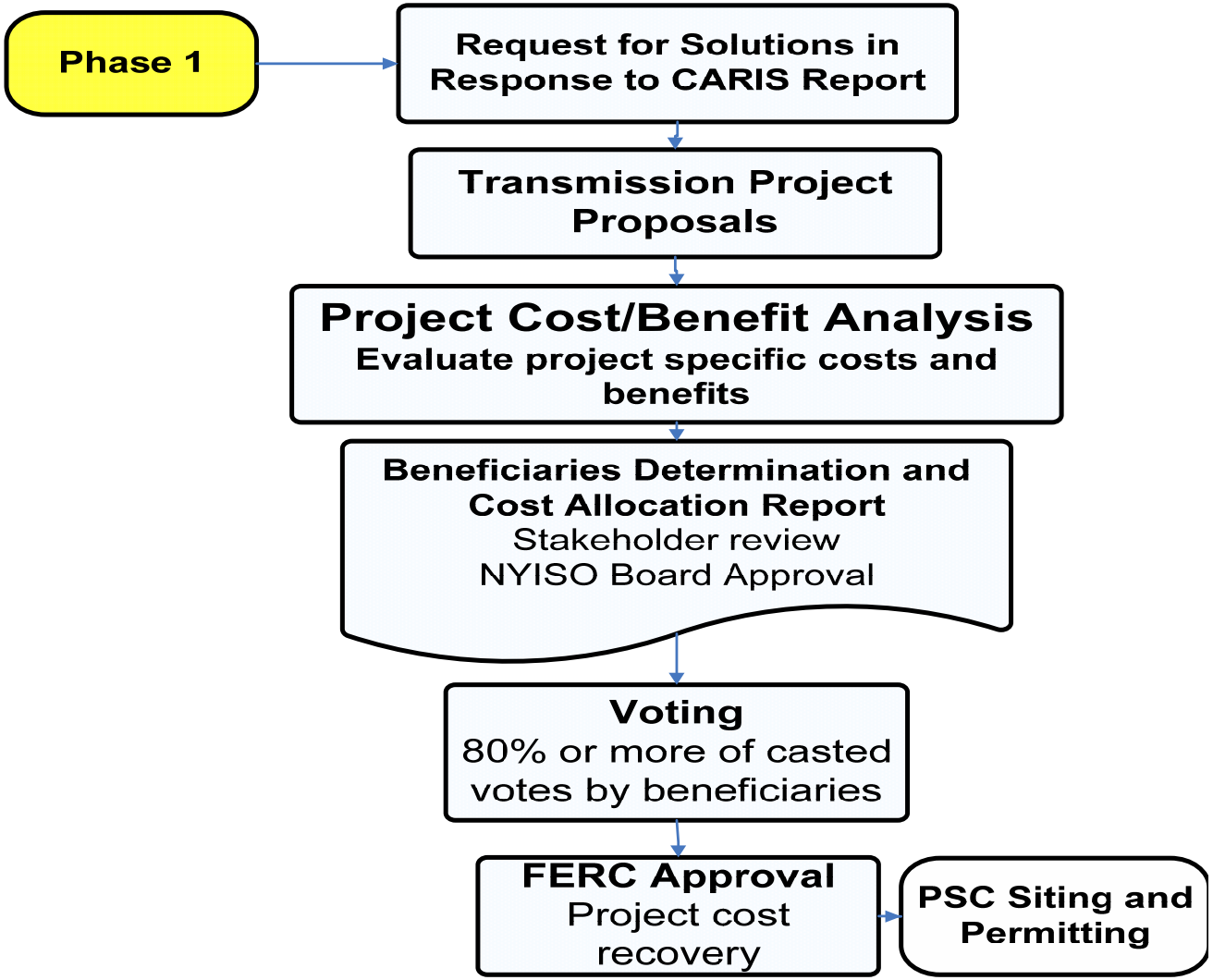
CARIS Report

Stakeholder reviews

NYISO Board Approval

September - November 2009

CARIS – Phase 2
Transmission Project Phase - 2010



Inter-regional Planning Issues & Initiatives

Northeast Planning Regions

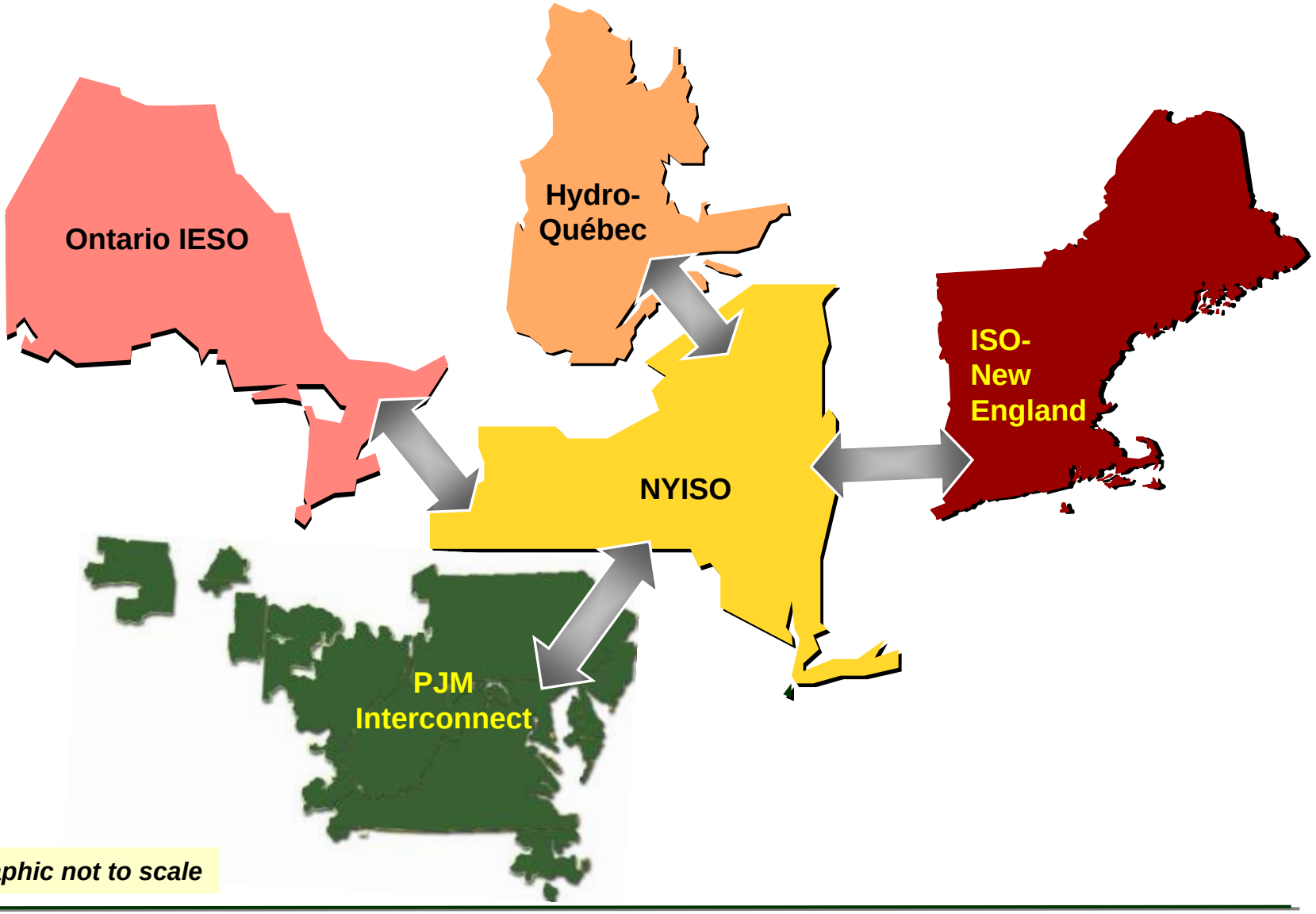
Northeastern ISO/RTO Coordination of Planning Protocol

- **Northeastern Protocol**
  - *Initiated in December 2004 by ISO-NE, NYISO & PJM*
  - *IESO, Hydro-Quebec TransÉnergie & New Brunswick are participating on limited basis*
  - *ISO/RTO Coordination Committee ("JIPC")*
  - *Regional stakeholder committee ("IPSAC")*
  - *FERC found Protocol satisfies Order 890's (Inter-) Regional Planning Principle*
- **Objectives of Protocol**
  - *Provide a vehicle for enhanced coordination of planning throughout the Northeast*
  - *Address planning-related seams issues*
  - *Enhance coordinated performance of the bulk system*
  - *Support and supplement (not replace or supercede) each ISO's individual regional planning procedures*
  - *Protocol will be modified as needed to ensure consistency with RTO/ISOs' tariffs*

Northeast Inter-regional Studies

- **“Loss of Source” Analysis**
- **PJM 500KV Expansion Impacts**
- **North Country Wind Operating Studies**
- **Plattsburgh-Vermont PV 20 Upgrade Study**
- **Queue Projects w/Potential Inter-Regional Impacts**
- **Multi-Regional Transfer Analysis**
- **Market Efficiency Study**

NYISO at the Hub



Graphic not to scale

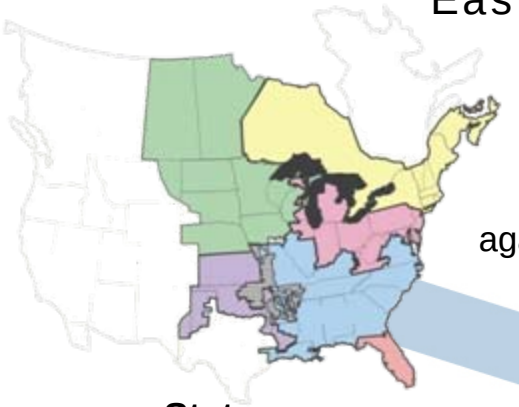
New York Planning Initiatives

- **NY State Energy Planning Process**
  - ***Draft Plan Due July 2009***
- **NYPSC Proceedings**
  - ***Long Term Planning***
  - ***Energy Efficiency***
  - ***Renewable Portfolio Standards***
- **NYISO Wind Integration Studies**
  - ***Operational & congestion analyses***
- **NY State Transmission Assessment and Reliability Study (STARS)**
  - ***Long Term Transmission System Needs (looks beyond NYISO 10-year planning horizon)***
- **NY City Transmission Study**

Inter-regional Planning Initiatives

- **DOE Eastern Wind Integration & Transmission Study (EWITS)**
- **Joint Coordinated System Plan (JCSP)**
- **Eastern Interconnection Planning Collaborative (EPIC)**

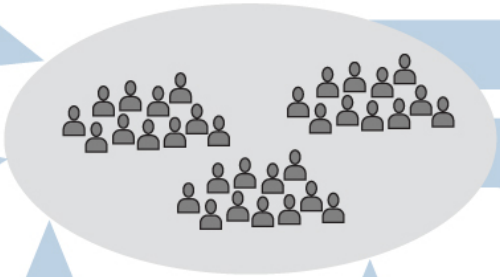
Eastern Interconnection Planning Collaborative



•Rolls-up regional plans
•Coordinates with Canada, Western Interconnect and Texas
•Receives stakeholder input and holds public meetings
•Performs studies of various transmission alternatives against national, regional & state energy/economic/environmental objectives
•Identifies gaps for further study

Publishes Annual Interconnection Analysis

States
•Regional Policy recommendations
•State energy policies
•Rate Policies



Annual interconnection analysis

Regional/state compliant plans provided as input

Study gaps relative to national, regional and state policy

DOE/FERC
Provides policy direction, assumptions & criteria

States
•Policy recommendations
•State energy plans

Regional Plans and Projects

FERC
• Review/direction
• Order adjustments

ISO / RTOs & Order 890 Entities
•Produce Regional Plan through regional stakeholder process, including state regulatory authorities

STARS

State Transmission Assessment and Reliability Study (STARS)

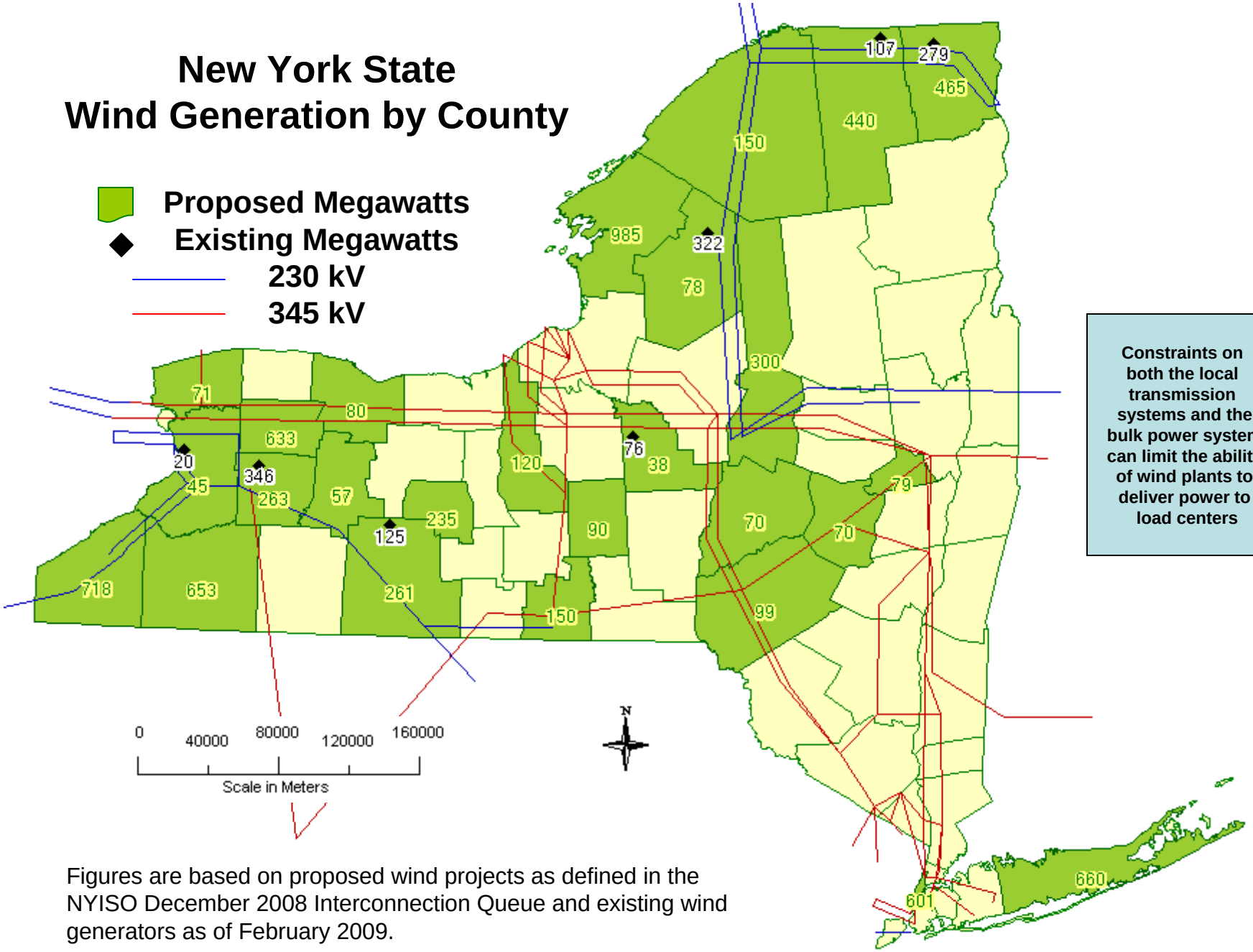
- **Phase I:** Model development and study assumptions for years 2018 and 2028. Reliability assessment for the existing transmission system.
- **Phase II:** Transmission transfer limit analysis for the requirements identified in Phase I and evaluation of system improvement options.
- **Phase III:** Detailed assessment of synergies between replacements and upgrades of transmission systems with additional sensitivities on transmission scenarios identified.

The targeted completion date for Phases I & II is August 2009.

Wind: A Future Congestion Challenge

- In New York State, wind power development is primarily in the North & West, while load centers are in the Southeast
  - *Currently, **1,275 MW** of wind are interconnected*
  - *An additional **1,000+ MW** are expected in 2009*
  - *Another **6,500 MW** of wind is in the interconnection queue*

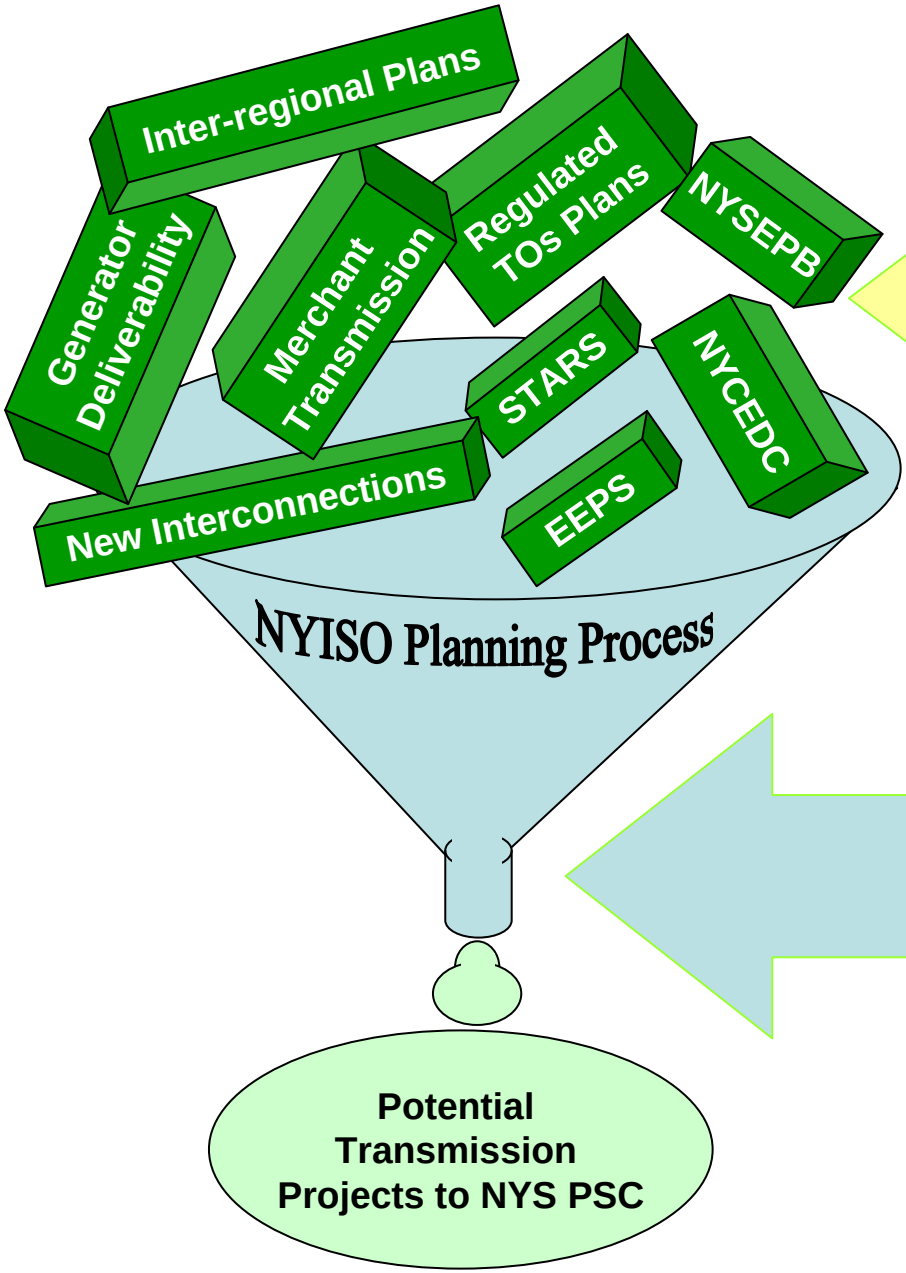
New York State
Wind Generation by County



Constraints on both the local transmission systems and the bulk power system can limit the ability of wind plants to deliver power to load centers

Figures are based on proposed wind projects as defined in the NYISO December 2008 Interconnection Queue and existing wind generators as of February 2009.

How Various Studies Fit together



NYISO Ongoing Activities:

- ***Providing reliability and market information***
- ***Proper market design fostering new investment***
- ***Tariff: interconnection, planning, & cost recovery***

NYISO in Project Evaluations:

- ***System Reliability Impact Studies (SRIS) – 3 Phases***
- ***System Impact Studies (SIS) and TCC Allocations***
- ***Reliability planning studies (CSPP)***
- ***Economic Planning Studies (EPS = CARIS Order 890)***
- ***Cost and benefit assessment***
- ***Ranking & validation of project benefits***

The New York Independent System Operator (NYISO) is a not-for-profit corporation that began operations in 1999. The NYISO operates New York's bulk electricity grid, administers the state's wholesale electricity markets, and conducts reliability and resource planning for the state's bulk electricity system.

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www.nyiso.com