



USAID
FROM THE AMERICAN PEOPLE



N A R U C
National Association of Regulatory Utility Commissioners

National Association of Regulatory Utility Commissioners Energy Regulatory Partnership Program

Reliability Issues

Raj Addepalli – NYS PSC
Chief, Resource Policy and Planning
Office of Electricity and Environment
NYS Department of Public Service

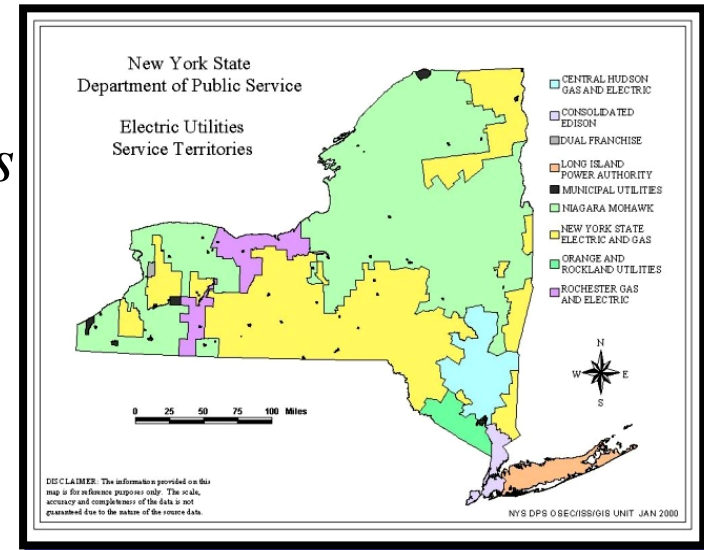
Sponsored by USAID and NARUC
June 2007

Overview of Presentation

- New York's Electric Structure
- Monitoring Reliability of the Distribution and Transmission Systems
- Standards
- Notification Requirements
- Reliability Performance Plans
- Monitoring Extreme Events

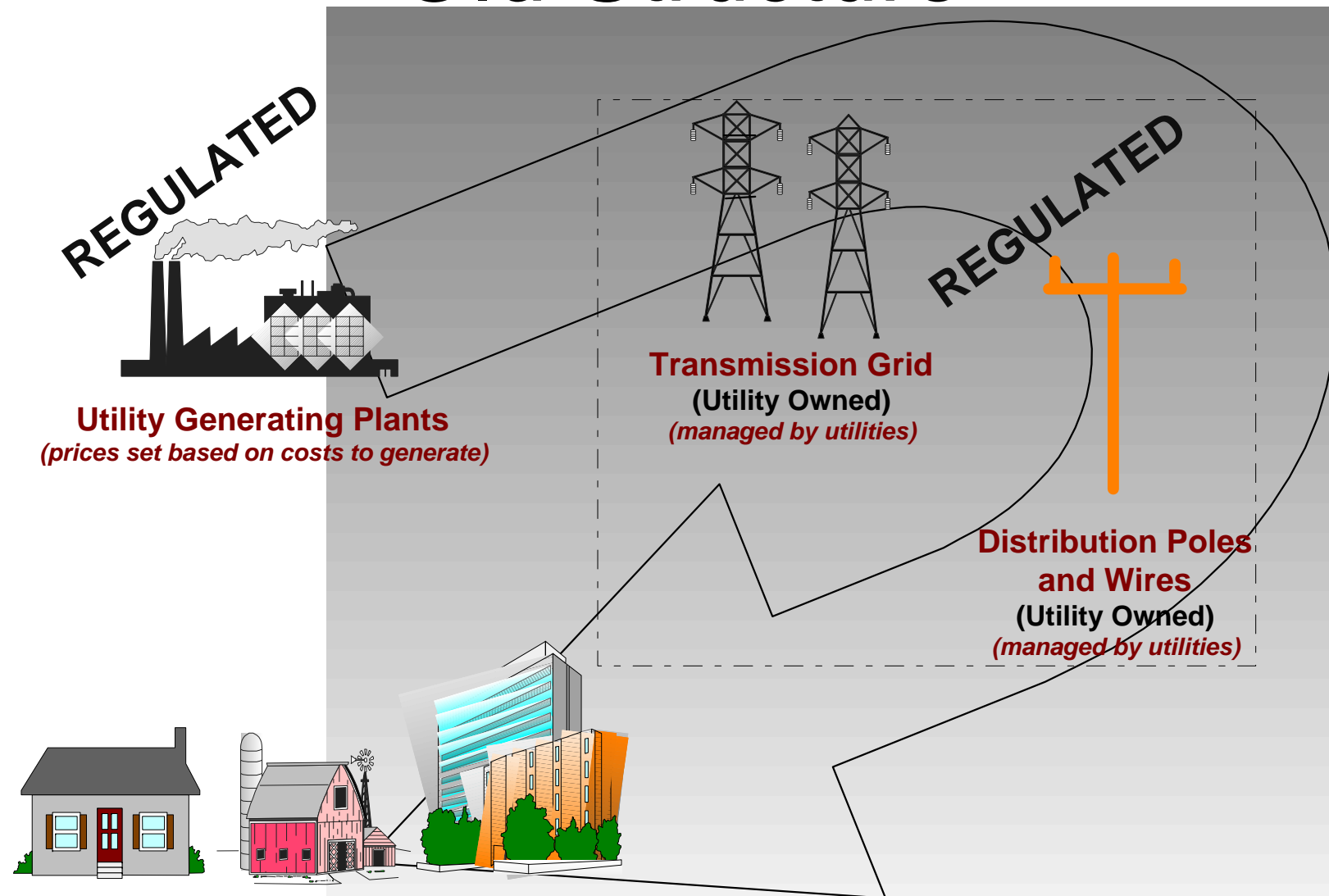
Basics of the New York Electric System

- Service Providers:
 - *6 Major Investor-Owned Utilities*
 - *2 Large Power Authorities*
 - *47 Small Municipalities*
 - *4 Small Rural Electric Co-ops*



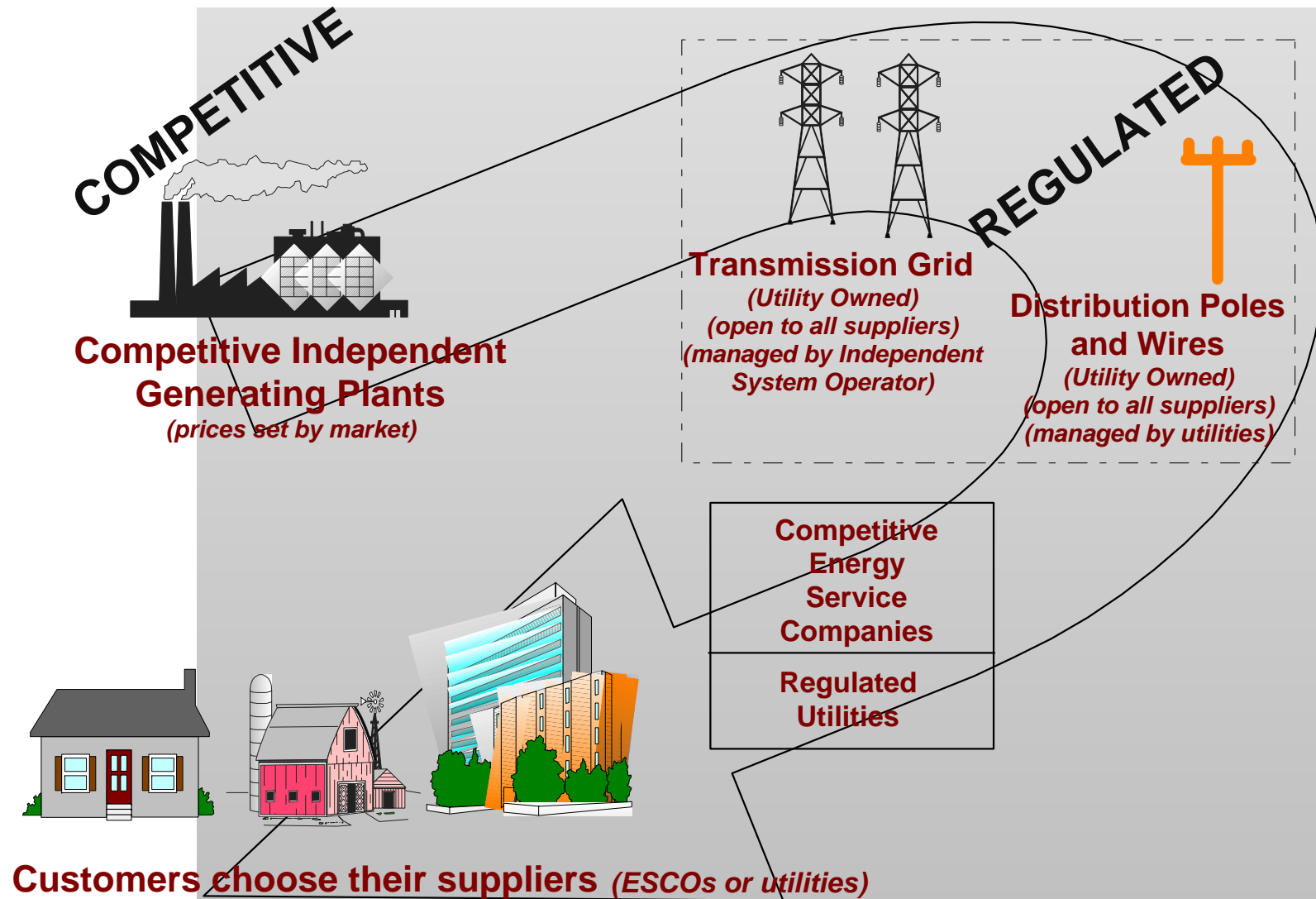
- Load: nearly 34,000 MW at peak
 - 16,000 MW in New York City and Long Island*
 - ☞ *Electric transmission congestion downstate*
- Generating capacity: about 39,000 MW

Old Structure



Customers generally served by regulated utility

New Structure (Post-Divestiture)



Electric Reliability

- T & D systems are very reliable
 - *NYC's reliability is the best in the nation*
- Industry adherence to reliability standards
- Weather can cause major disruptions
 - January 1998 - Ice storm hits Northern New York
 - July 1999 - Heat wave in NYC
 - September 1999 - Hurricane Floyd

Electric Reliability Concerns

- Impacts of industry restructuring
 - *Focus on T&D business*
 - *Federal legislative and regulatory activity*
 - *Mergers and acquisitions*
- Demand for electricity is rising
- Increasing customer expectations
- Aging Infrastructure

Reliability – Recent Trends

- Capital and O&M spending on T&D
 - *Decreased in late 1990s/early 2000s*
 - *Rebounding now with utilities looking to upgrade infrastructure*
- Increased productivity and asset maximization
 - *Automated switching and sectionalizing*
 - *Advanced system monitoring*
 - *Improved equipment*
 - *Reliability centered maintenance*
 - *Outage management systems/crew utilization*
- Workforce
 - *Age/Retirements affecting overall levels and knowledge base*
 - *Aggressive training and recruiting programs*

PSC oversight of Reliability and Adequacy Standards

- The Energy Policy Act of 2005 allows New York to establish reliability standards that are stricter than the national standards.
- In February 2006 the PSC adopted the New York State Reliability Council (NYSRC) Reliability Rules. This makes the rules enforceable on a governmental/regulatory basis.
- In accordance with its reliability rules, the Executive Committee of the NYSRC annually establishes a statewide installed capacity reserve margin (IRM).
- The IRM requirement is designed to ensure generation adequacy and result in a loss of load expectation (LOLE) of no more than one occurrence every ten years.
- On March 8, 2007 the PSC adopted the 16.5% IRM established by the NYSRC for the capability period beginning in May 2007.

Locational ICAP Requirements

- The NYISO Operating Committee approves locational installed capacity requirements (LCR) applicable to New York City (NYC) and Long Island (LI). The LCR's are needed because of the current limited amount of electric transmission into these areas.
- Load serving entities in these area are required to purchase a minimum amount of ICAP electrically located within these areas.
- The LCR's are:
 - NYC: 80% of forecast summer peak load
 - LI: 99% of forecast summer peak load

Operation & Planning Standards

High Voltage Transmission System Standards

- Mandatory, explicit standards
- Multi-level, multi-jurisdictional
- National Standards
 - Industry developed through North American Electric Reliability Corporation
 - Federally adopted and enforced with \$1 million/day penalties possible
- Regional & State Standards
 - More stringent than national standards; or
 - Address reliability issues not covered by national standards
 - New York enforces within state

Lower Voltage Transmission System Standards in NY

- Guidelines developed by individual utility
- Economic impact considered for application and enforcement

Service Standards

- Adopted in 1991 (updated in 2004)
- Establishes expected levels of service under typical operating conditions in regions
 - Measure for Frequency of interruptions (SAIFI)
 - Measure for Duration of interruptions (CAIDI)
 - Excludes “Major Storms” (10%+ customers out or >24 hrs) to normalize data for year to year comparisons
- Setting appropriate targets
 - Primarily based on historic performance and trends
 - Geographic and technology conditions
 - Demographics and customer expectations
 - Allow more room for yearly variability in smaller regions
 - Set like targets in similar regions for benchmarking

Service Standards

- Statutory requirement for interruption data monthly and by cause (equipment failure, lightning, tree contacts, accident, etc.)
- Power quality requirements
 - Voltage supply levels (ANSI C84.1-1995)
 - Momentary interruptions and other power quality events by cause
- Annual report by utilities
 - Analysis of interruption data
 - Identify worst performing circuits
 - Future plans and corrective actions based on performance

Commercial / Technical

- PSC requires utilities to meet ANSI C84.1-1995 which sets voltage deviation limits
 - Explicit voltage ranges for low and medium voltage
 - Percent ranges for high voltage
 - Commission has authority to mandate corrective actions for non-compliance
 - Occurrences not that common
 - Utility have agreed to corrective action where necessary
- Utilities expected to meet IEEE 519 (harmonics) but no specific PSC mandate

Safety Standards

- *Implemented as a result of fatality in New York City*
- *Stray voltage testing requirement*
 - *All utility facilities and streetlight annually*
 - *Immediate corrective actions if voltage found*
- *Inspect all facilities on a five year cycle*
- *Additional requirements*
 - *Annual report and officer certification*
 - *Quality assurance program*
 - *Must adhere to National Electric Safety Code*
 - *Substantial revenue adjustments for failing to comply*

Notification Requirements

- Electric Service Issues
 - Transmission line outages
 - Outages affecting over 5,000 for more than 30 minutes
 - Load shedding, voltage reductions, or other emergency procedures
- Shock incidents and personal injuries
- Vehicular Accidents involving utility facilities
- Unusual and Media Attention Events
 - Substation fires and manhole explosions
 - Outage affecting high profile customer (hospital, mall, etc)

Reliability Performance Plans

- The 6 major investor-owned utilities in New York have performance based incentive plans
- The plans are independent and designed to prevent deterioration in reliability
- Reliability targets are based on frequency and duration measures on a company-wide basis

Reliability Performance Plans

- Plans may target certain areas for improvements
- Examples:
 - *Momentary interruptions by voltage class
(distribution, sub-transmission, transmission)*
 - *Circuit breaker replacement goals*
 - *Enhanced tree trimming*

Reliability Performance Plans

- Failing to meet targets results in negative revenue adjustments (total exposure ranges from \$360K to \$60M based on company's plan)
- Summary of recent actions:
 - *4 utilities missed targets between 2001 and 2004*
 - *Approximately \$21 million in negative revenue adjustments*
- Plans may contain language to increase dollar exposure if a target is missed on a continued basis

Extreme Events

- Utilities must file emergency plans detailing mitigation and restoration activities
- Track interruptions using an emergency outage reporting system
 - *GIS based*
 - *Tied to utility outage management systems*
 - *Basis for allocating state resources*
 - *Prepare maps, reports, and charts*
- Open communication during an event