

New York State Energy Planning Board

Final Draft

New York State Transmission and Distribution System Reliability Study and Report

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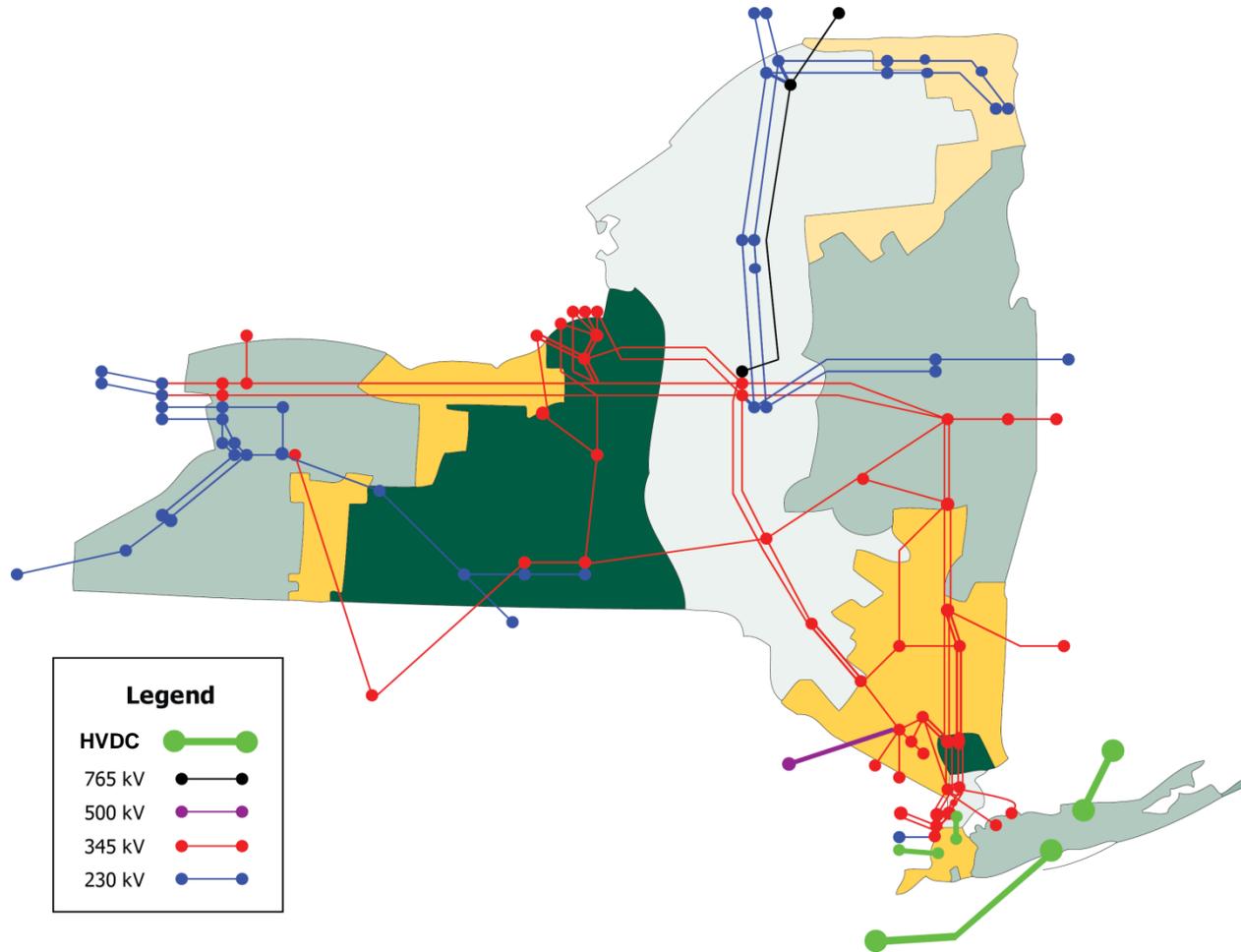
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T&D Reliability Study Highlights

- Introduction and Overview
- Transmission System Reliability
- Distribution Reliability
- Investment and Expenditures
- Environmental Regulations
- T&D Reliability Impacts from Policy
- Future T&D Reliability Issues
- Key Findings and Recommendations

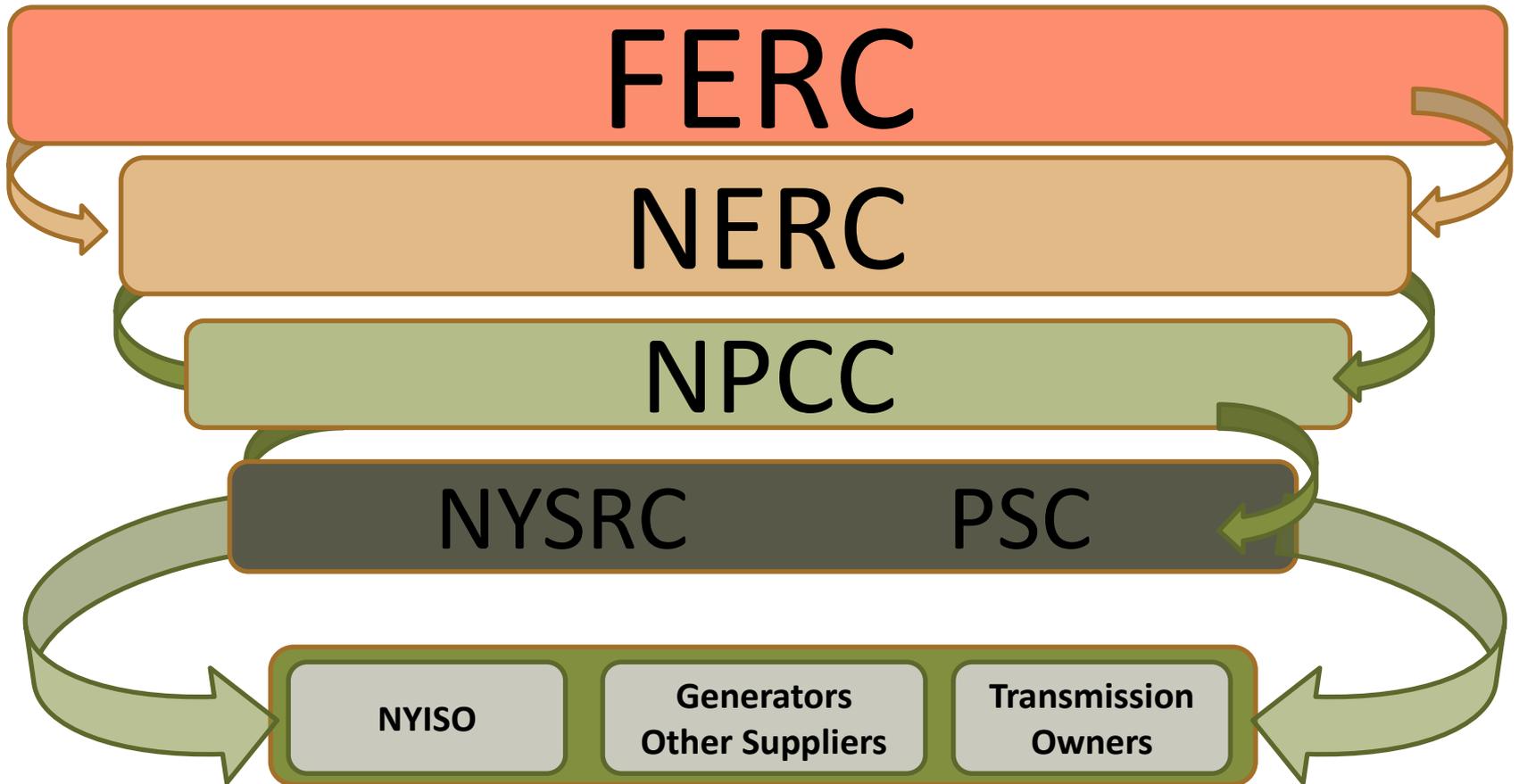
Overview of The Electric System

New York State High Voltage Transmission



Transmission System Reliability

Reliability Oversight



Distribution System Reliability

Distribution Reliability Metrics

Customer Average Interruption Duration Index
(CAIDI)

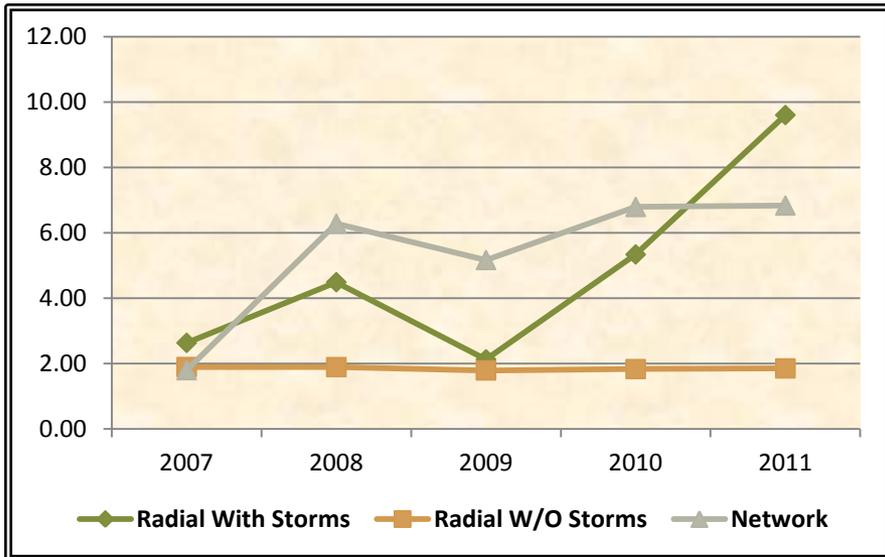
Number of Customer Hours/ Number of Customers Affected

System Average Interruption Frequency Index
(SAIFI)

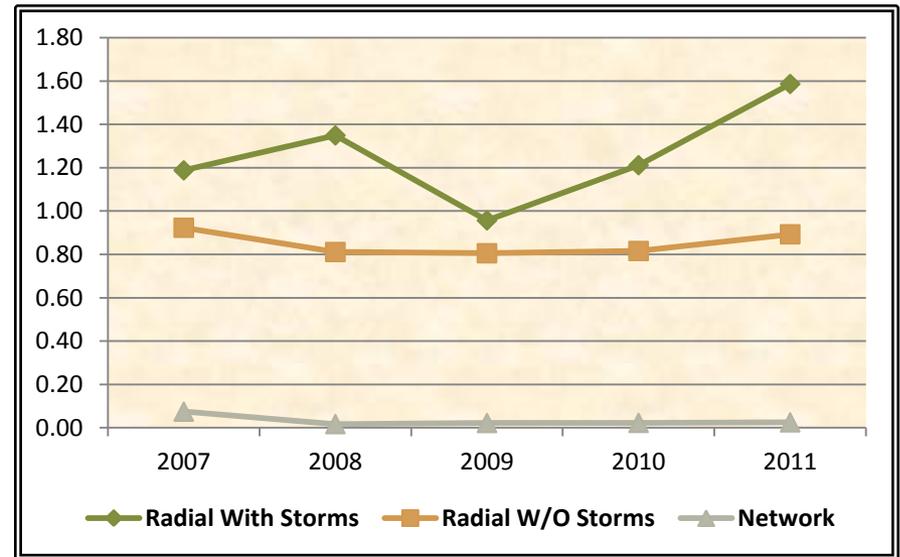
Number of Customer Affected/Number of Customers Served

Distribution Performance

CAIDI for Radial and Network

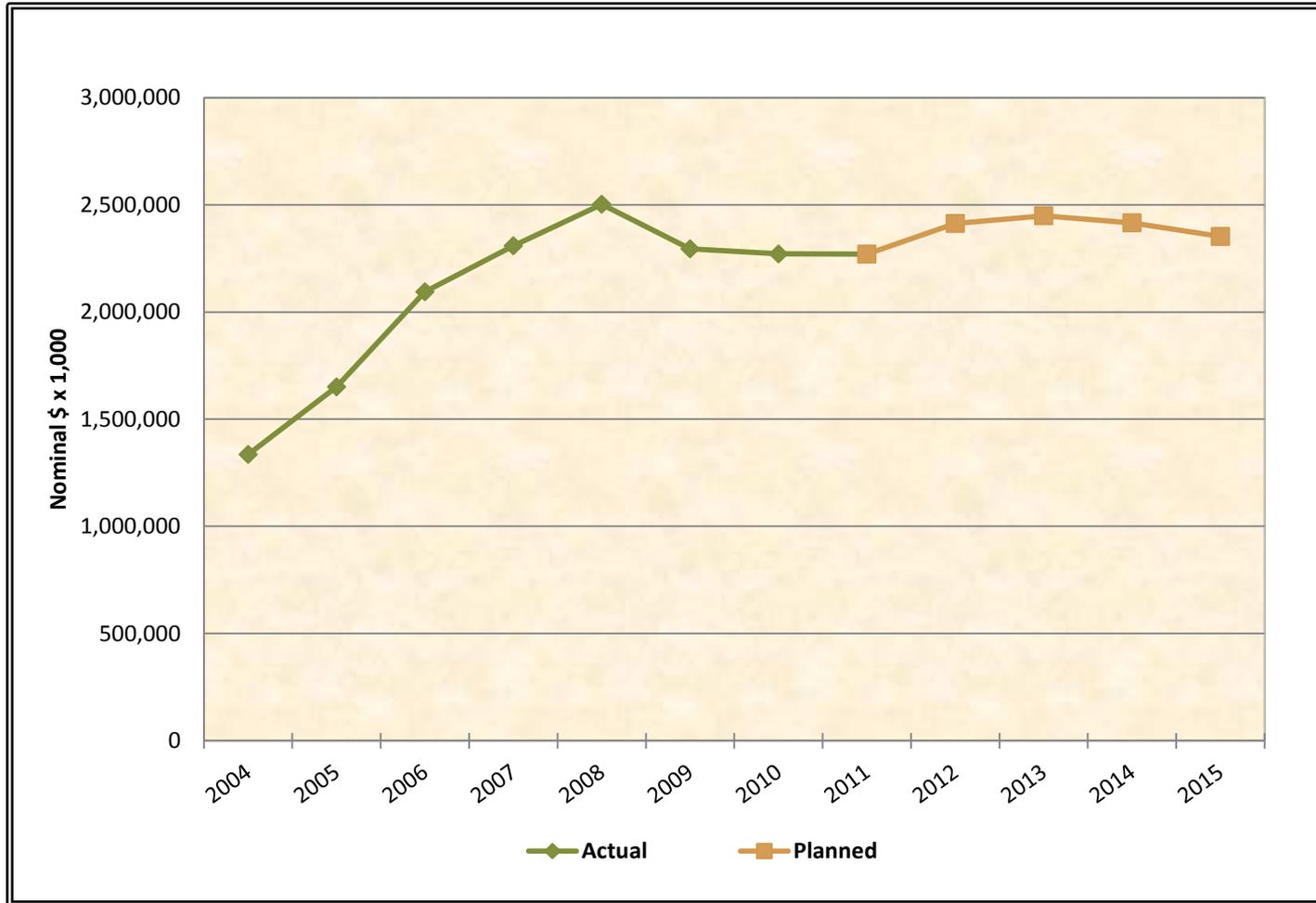


SAIFI for Radial and Network

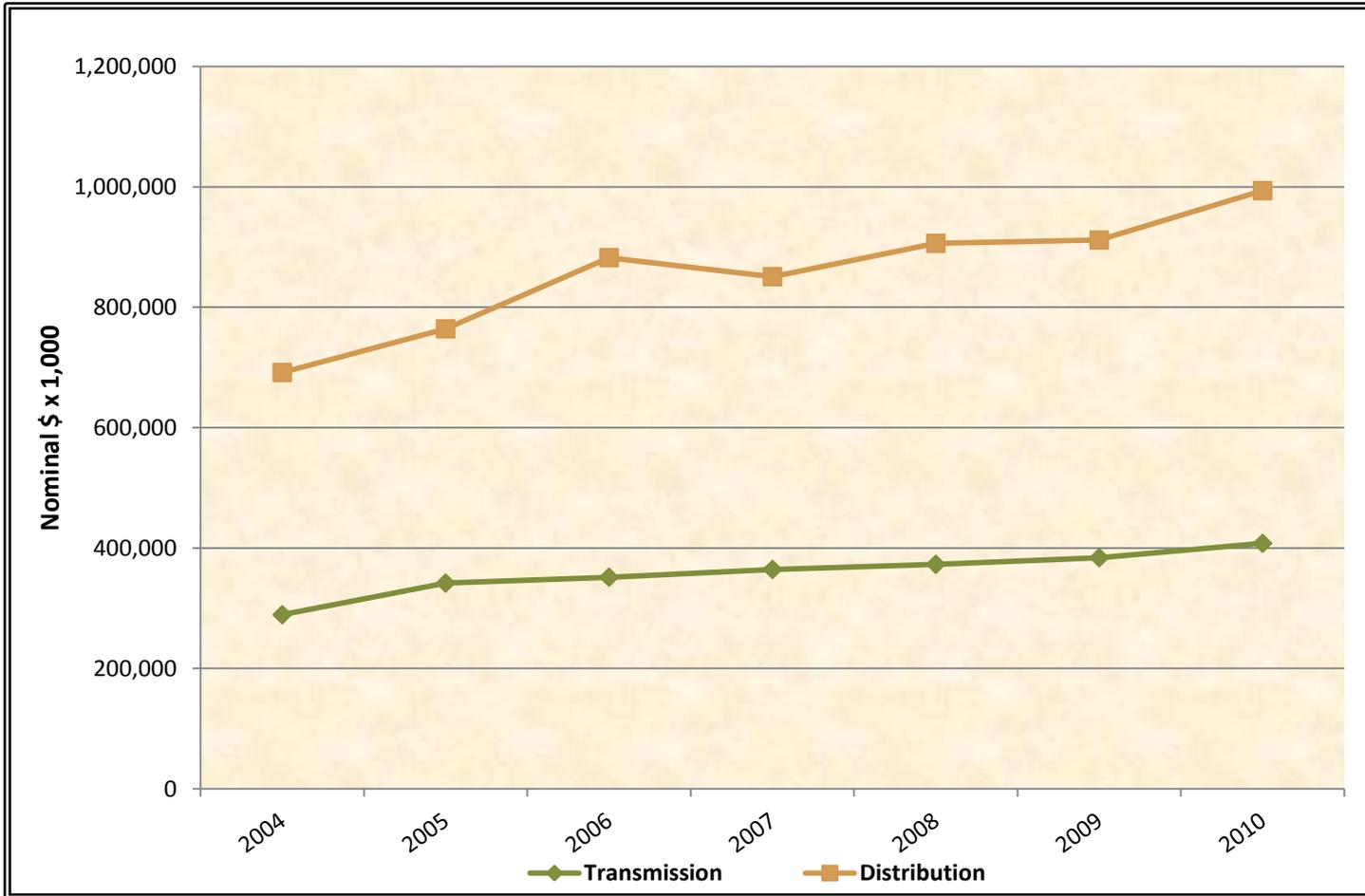


Investment and Expenditures

Utility Capital Expenditure (\$000s)



Electric O&M Expenses (\$000s)



Environmental Regulations

Environmental Regulations

- Existing Rules
 - NO_x RACT Rule
 - Best Available Retrofit Technology (BART) Rule
 - Utility MACT Rule
 - Best Technology Available (BTA) Policy
- New and Future Rules
 - Cooling Water Intake Structures
 - Coal Combustion Residuals
 - CO₂ Emission Allowance

Impacts to Reliability

Reliability Impacts From Policies

- Load
 - Energy Efficiency
 - Large Load Growth
 - Other Load Varying Mechanisms
- Generation
 - Renewable Portfolio Standard
 - Distributed Generation
- Transmission & Distribution
 - Bulk Electric System Definition
 - Performance Rate Making, Multi-Year Rate Agreements, and other Departures from Traditional Regulatory Mechanisms
- Regulatory
 - Corporate Reorganization of Electric Utilities

Possible Future Reliability Issues

Generation

- **Retirements**
 - Environmental Initiatives
 - Nuclear Relicensing
 - Market Conditions
- **Results**
 - Fuel Mix Issues/Supply Diversity
 - Increases natural gas/electric interdependence and need for coordination

Transmission

- **Aging Infrastructure**
 - 2,300 miles over the next 10 years are nearing design life
 - 1,200 additional miles in next 10 to 20 years
- **Results**
 - Increases maintenance and downtime
 - Increases risk from unavailability

Load

- **Variations**
 - Smart Grid and Emerging Technologies
 - Electric Vehicles
- **Results**
 - Transition for both technology and process poses challenges
 - Implemented correctly, new technologies could optimize asset use and operational efficiency

External Forces

- **Sources**
 - Security Threats
 - Geomagnetic Disturbances
 - Aging Workforce
- **Issues**
 - Risks known and estimated
 - Mitigation measures developed
 - Effectiveness unknown

Key Findings and Recommendations

- As assessed using existing metrics, the electric system meets reliability standards
- Allow system planners and operators flexibility in their response to implement state policies
- Support cost-effective replacement of aging infrastructure
- Support diverse mix of electric generation fuel sources
- Monitor gas/electric interdependence
- Encourage workforce development
- Support distributed generation technologies
- Improve storm mitigation, restoration, and communication

Questions?