

NYISO Strategic Plan 2020-2024

Environmental Advisory Council

Troy, NY

October 24, 2019



Recent Accomplishments

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- Using the **Public Policy Transmission Planning Process**, the NYISO Board of Directors selected critically needed transmission upgrades to increase delivery of clean energy resources
- Implemented a new **Operating Reserve Region (J)** for New York City to provide more efficient resource scheduling and procurement, location-specific price signals and improved investment incentive
- Completed market design for **Energy Storage Resources (ESR)** and initiated software development
- Completed pioneering market design for **Distributed Energy Resources (DER)** wholesale market participation
- Completed the development of a first-in-the-nation **Carbon Pricing Design** with stakeholders
- Expanding our role as an authoritative source of information on New York's bulk electric power system, launched a new **Website** which provides stakeholders with easier access to publications, reports and studies
- Released the **2018 Report of the Consumer Interests Liaison**, analyzing the effects of changes to the wholesale electricity market on consumer costs, system reliability, the environment, and transparency of NYISO operations
- Negotiated and executed a new five-year **Budget Facility Loan** to fund capital investments, software development projects and other strategic initiatives
- Established a new five-year **Revolving Credit Facility** which serves as a cash flow management tool that provides liquidity to the NYISO-administered markets

Recent Accomplishments






- Issued the **Reliability and Market Considerations for a Grid in Transition** whitepaper describing emerging reliability and economic challenges, identifying gaps and proposing next steps
- Published the **2019 Master Plan** providing a cohesive strategic vision for market design efforts over the next five years
- Published the **2019 Power Trends**, highlighting the challenge of integrating energy storage and DER into wholesale electricity markets, and of the development of a novel carbon-pricing program. Widely circulated to influential policymakers, regulators, business leaders and stakeholders, the report received tremendously positive feedback
- Issued the **2019-2028 Comprehensive Reliability Plan** including a scenario developed in close coordination with transmission owners to proactively assess potential impacts to electric system reliability related to implementation of the Department of Environmental Conservation's proposed "peaker" rule
- Conducted a **Fuel and Energy Security Study** assessing winter fuel/energy security for the New York Control Area under various assumptions and scenarios
- Utilized **Alternative Locational Minimum Installed Capacity (LCR)** methodology to produce greater stability in the LCRs
- Implemented the **Modeling of certain 115 kV Constraints** in market solutions to better reflect the impacts and value of maintaining transmission system reliability into market prices for such facilities
- Continued the **IT Strategy** evolution that employed a modern software delivery methodology and expanded automated testing capabilities; increased IT Infrastructure automation; and continued adoption of cloud computing infrastructure for targeted solutions
- Continued the **Cybersecurity Strategy** implementation of a fully functional Cybersecurity Operations Center (CSOC) providing a comprehensive 7 x 24 security operations capability

Strategic Landscape

Challenge to Harmonize Markets with Public Policy

Wholesale Market Evolution Critical for Clean Energy Goals

New York State Climate Leadership & Community Protection Act

 <p>Renewables</p> <ul style="list-style-type: none"> 70% by 2030 <p>Electric Sector GHG Reduction</p> <ul style="list-style-type: none"> 100% by 2040 	 <p>Offshore Wind</p> <ul style="list-style-type: none"> 9,000 MW by 2035 	 <p>Solar Energy</p> <ul style="list-style-type: none"> 6,000 MW by 2025 	 <p>Battery Storage</p> <ul style="list-style-type: none"> 3,000 MW by 2030 	 <p>Energy Efficiency</p> <ul style="list-style-type: none"> 185 trillion BTU reduction by 2025 vs forecast
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WIDE-SCALE ELECTRIFICATION OF HEATING, TRANSPORTATION AND INDUSTRIAL SECTORS



Operations Implications

- Marked increase in number of wholesale resources participating in NYISO markets
- Increased need to monitor congestion on lower voltage circuits from increased participation of distributed resources
- Need to coordinate operations with Distribution Systems Platform (DSP)
- Increased need for flexibility due to resource and load uncertainty (e.g. ramping, load following, quick-start capability)

Market Implications

- Increased participation of Distributed Energy Resources, Micro-Grids and Aggregators in wholesale markets
- Accelerating growth in both grid-scale and rooftop solar as well as on-shore and off-shore wind resources
- Growth in grid-scale storage as well as aggregations of storage with other distributed resources
- Increased regulatory and investment risk from state sponsored resource additions and policy actions
- Increased need to consider mitigation construct

Financial Implications

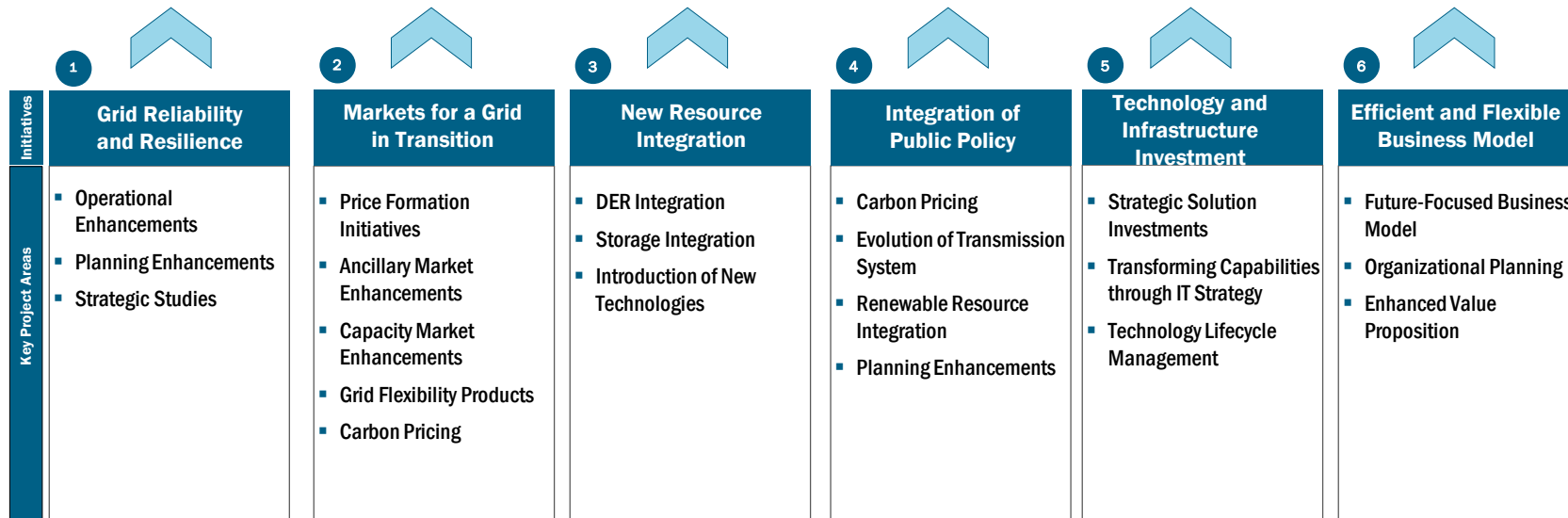
- Depressed energy prices with the proliferation of zero marginal cost resources (wind and solar), increasing importance of ancillary pricing
- Capacity market increasingly provides majority of fixed cost recovery for quick-start resources needed for flexibility
- Significant increase in number of market participants needing settlement and credit monitoring services
- Complexity of grid and market operations lead to increase in NYISO personnel and budget requirements



Strategic Plan 2020-2024

Strategic Overview

NY State's clean energy requirements will be met by leveraging the power of competitive markets to drive efficient, reliable outcomes. The NYISO Strategic Plan guides the design and implementation of a portfolio of market products that achieves the proper balance of supporting public policies while maintaining reliability and economic efficiency.



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Grid Reliability and Resilience

Priority Projects in Support of Strategic Initiatives

Maintaining power system reliability is the NYISO's primary responsibility, and the role of wholesale markets is critical in carrying out this responsibility. The changing portfolio of resources serving the electric needs of New York will require a comprehensive review of the NYISO's existing market products and operational and planning practices to ensure the continued ability to efficiently and reliably serve New York's electricity requirements. Significant study work is needed to take a deeper dive into evolving focus areas.

Operational Enhancements

- Operational Situational Awareness
- Operational Impact Assessments of Environmental Retirements
- Reserve Procurement for Flexibility
- Solar on Dispatch
- Enhancements to IRM/LCR Models

Planning Enhancements

- Comprehensive System Planning
- Process Improvements
- Planning for Environmental Impacts

Strategic Studies

- Enhancing Fuel and Energy Security
- Impact of Climate Change Study

2

Efficient Markets for a Grid in Transition Priority Projects in Support of Strategic Initiatives

The addition of renewable resources, energy storage and DER will create a more dynamic grid, where supply is increasingly comprised of weather-dependent renewable resources and flexible resources will be needed to balance intermittent generation. Incenting resource flexibility, which includes the ability to respond rapidly to dynamic system conditions, providing controllable ramp with fast response rates, and providing frequent startup/shutdown capability, will be key to future market enhancements at the NYISO.

Price Formation Initiatives

- Improving Capacity Price Formation
- Constraint Specific Shortage Pricing
- Enhanced Fast Start Pricing

Grid Flexibility Products

- Reserve Procurement for Flexibility

Ancillary Market Enhancements

- Ancillary Services Shortage Pricing
- Reserve Enhancement for Constrained Areas

Capacity Market Enhancements

- Tailored Availability Metric
- Capacity Value Study
- Demand Curve Reset

Renewable Resource Integration

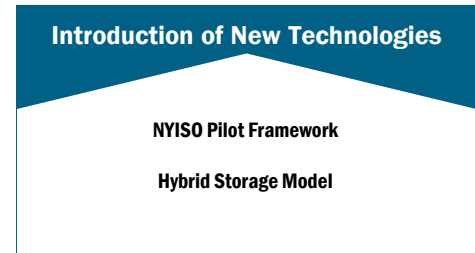
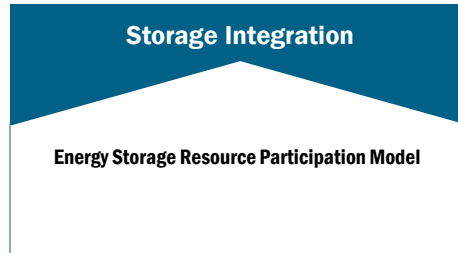
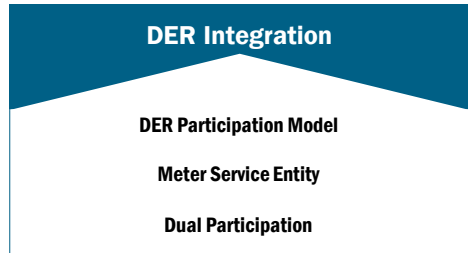
- Carbon Pricing in the Energy Market
- Comprehensive Mitigation Review

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New Resource Integration

Priority Projects in Support of Strategic Initiatives

Technological advancements and public policies, particularly the Climate Leadership and Community Protection Act (CLCPA) and Reforming the Energy Vision (REV), are encouraging greater adoption of DER to meet consumer energy needs. DER offer the potential to make load more dynamic and responsive to wholesale market price signals, potentially improving overall system efficiencies. The NYISO believes that opening its markets to DER will improve the strength and efficiency of the electric grid.



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Integration of Public Policy

Priority Projects in Support of Strategic Initiatives

The CLCPA sets the stage for aggressive state action to reduce greenhouse gas emissions and promote expansion of renewable and distributed energy resources. It is imperative that the NYISO accelerate development of steps to harmonize wholesale electric power market design with state public policy goals.

Carbon Pricing

- Design Carbon Pricing in the Energy Market
- Implement Carbon Pricing in the Energy Market

Evolution of Transmission System

- Public Policy Transmission Planning Expansion
- Comprehensive System Planning Process Improvements

Renewable Resource Integration

- Solar on Dispatch
- Hybrid Storage Model
- Comprehensive Mitigation Review

Planning Enhancements

- Planning for Environmental Impacts

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Technology and Infrastructure Investment

Capabilities and Priority Projects in Support of Strategic Initiatives

The capabilities outlined in the IT Strategy and technology investments in various projects will position the NYISO with the flexibility and agility to comprehensively respond to emerging industry trends like the integration of renewables, energy storage and distributed resources, and at the same time, continue to maintain reliable operations of grid and market systems while being responsive to increased security risks.

Strategic Solution Investments

- EMS/BMS Operational Enhancements
- Distributed Energy Resources
- Energy Storage
- Enterprise Information Management - Data Integration
- Expanding Capacity Eligibility

Transforming Capabilities through IT Strategy

Strategic Objectives:

- Modernize Delivery Capabilities and Application Architecture
- Increase Infrastructure Automation and Enhance IT Service Management
- Mature the Enterprise Cloud Management Framework
- Advance Cyber Security Risk Management Capabilities

Technology Lifecycle Management

Multi-year plan for technology focused on driving IT efficiency, managing costs and delivering business value.

Technology Lifecycle Projects:

- Database Upgrade and Platform Migration
- Network Infrastructure Upgrade
- Application Platform Upgrade - 2020

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Efficient and Flexible Business Model

Priority Projects in Support of Strategic Initiatives

The NYISO strives to maximize the value that we deliver to our stakeholders through the execution of reliable, cost effective service. In the current rapidly changing environment, continuous process improvement, product and service expansion, and business model refinement will shape the NYISO value proposition. The NYISO will improve organizational effectiveness; modernize systems for faster, more flexible response to market and regulatory changes; and continuously scrutinize the cost of operations. In addition, the NYISO will continue to emphasize our brand value while delivering premium service to our customers.

Future-Focused Business Model

- Financial Risk Assessment and Scoring Enhancements
- Settlement Systems Redesign and Modernization
- Finance Systems Data Integration
- Budget Recovery and Cost Management Enhancements

Organizational Planning

- Improved Performance Management Process
- DER Penetration Staffing Impact Planning
- Senior Staff Succession Planning
- Enterprise Succession Planning

Enhanced Value Proposition

- Campaign to Promote Value of Markets
- Branding and Reputation Management
- Customer Relationship Management Enhancements
- Process Improvement for Agility



The New York Independent System Operator (NYISO) is a not-for-profit corporation responsible for operating the state's bulk electricity grid, administering New York's competitive wholesale electricity markets, conducting comprehensive long-term planning for the state's electric power system, and advancing the technological infrastructure of the electric system serving the Empire State.