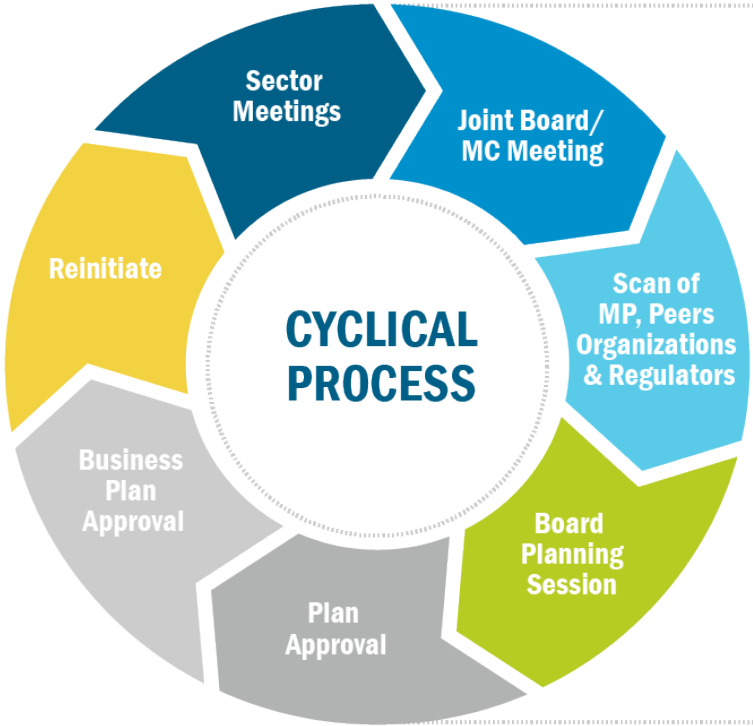
NYISO Strategic Plan 2018-2022

Management Committee

October 25, 2017

Strategic Planning Process

Process Overview



2017 Planning Timeline

April	June	July	August	September	October	November	December
Sector Meetings Generators Transmission Owners Other Suppliers End-Users Public Power & Environmental Parties Department of Public Service Meeting	**Joint Board/ Management Committee Meeting** Impact of Public Policy on Wholesale Markets Harmonization of Public Policy with Wholesale Markets	**July Board Meeting** Review of Key Strategic Issues Brattle Carbon Pricing Study Discussion	**Provision of Strategic Input to Board** Peer Organization & MP Strategy Scan Regulatory Scans CES & DER Whitepapers	**Strategic Planning Session** Review Draft 2018-2022 Strategic Plan & Alignment with 2016-18 Goals	**Approval of 2018-2022 Strategic Plan** Review Draft 2018 Budget Review Draft 2018 Annual Incentive Goals Review Draft 2018 Business Plan	**Approval of 2018 Business Plan** Approval of 2018 Budget Approval of 2018 Annual Incentive Goals Approval of 2018 Business Plan	**Publication of 2018-2022 Strategic Plan & 2018 Business Plan**

Sector Meetings Feedback

- **Clean Energy Standard (CES)**
  - Brattle Carbon Pricing Study
  - FERC Technical Conference on impact on state public policy on wholesale markets
- **Capacity Market Issues**
  - Alternative Mechanism for Locational Capacity Requirements
  - Rules for Capacity Zone Elimination
  - Capacity Exports from localities
  - Buyer-side mitigation rules
- **Integrating Distributed Energy Resources (DERs)**
  - DER Roadmap next steps
  - Coordination of wholesale markets with Distributed System Platform (DSP)
- **Public Policy Transmission Planning Process**
  - Western NY and AC Transmission Projects
  - Impact of CES on transmission

DPS Meeting Feedback

- **Clean Energy Standard (CES)**
  - Carbon Pricing Proposal
  - 115 kV limitations
  - HQ Imports
- **Reforming the Energy Vision (REV)**
  - Partnership needed to better define integration between Distributed System Platform (DSP) and wholesale markets
- **Public Policy Transmission Planning Process**
  - Progress on Western New York and AC Transmission
  - Planning for transmission to support off-shore wind

Joint Board/MC Meeting

- **Impact of Public Policy on Wholesale Markets**
  - How should NYISO as an Authoritative Source assess and communicate the impact of Public Policy proposals on wholesale markets?
  - How will the wholesale markets adapt to provide the necessary services (i.e., ramping, transmission security, inertia, frequency regulation) to balance the intermittent renewable generation?
- **Harmonizing Public Policy with Wholesale Markets**
  - Can Carbon Pricing align Public Policy with wholesale markets?
  - Can both conventional and renewable resources depend on revenues from wholesale markets for investment decisions?
  - Will locational price signals provided by carbon pricing provide better investment signals than the Renewable Energy Certificate (REC) and Zero-emission Credits (ZEC) programs?

Strategic Plan 2018-2022

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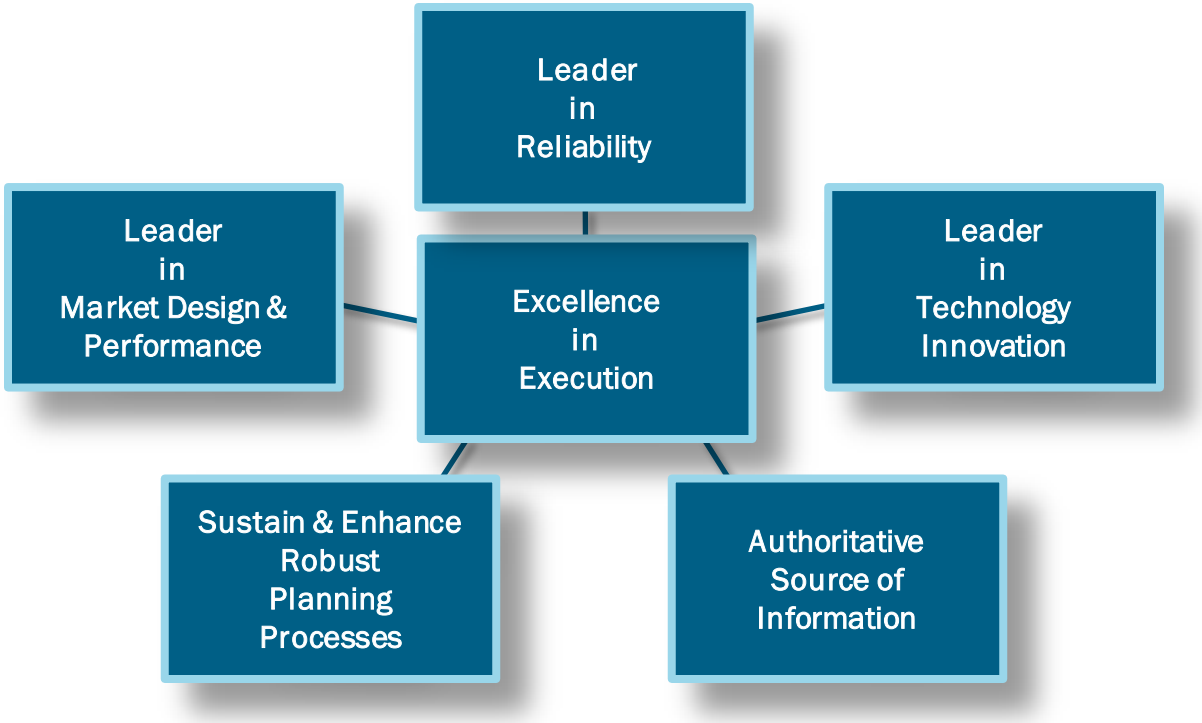
Core Values

Accountability	• *Taking responsibility to do what needs to be done*
Operational Excellence	• *Commitment to excellence in all our processes, systems and products*
Integrity	• *Commitment to honest, ethical, and transparent actions*
Team Work	• *Working together, succeeding together, respecting each other*
Customer Focus	• *Understanding the customer perspective*
Innovation	• *Pursuing creative and sound solutions*
Enthusiasm	• *Having a passion for our work and our interaction with our customers, stakeholders and policy makers*

The Mission of the New York Independent System Operator, in collaboration with its stakeholders, is to serve the public interest and provide benefit to consumers by:

- Maintaining and enhancing regional reliability
- Operating open, fair and competitive wholesale electricity markets
- Planning the power system for the future
- Providing factual information to policy makers, stakeholders and investors in the power system

Strategic Objectives



Strategic Initiatives

- NYISO has identified five Strategic Initiatives to address the evolving nature of New York's electricity grid as large scale renewables and distributed energy resources connect and place new demands on electricity markets and grid operations. These initiatives are:
  - Reliability through Markets
  - Integration of Distributed Energy Resources
  - Integration of Public Policy
  - Technology & Infrastructure Investment
  - Sustainable Business Model

Broader Context for Strategic Initiatives

	Themes & Trends	Implications
Reliability through Markets	• Growing regional dependence on gas • Growing uncertainty over gas infrastructure expansion • Tightening environmental restrictions in NYC • Nuclear retirement (Indian Point) • Public policy initiatives interacting with competitive markets	• Long-term system reliability linked to gas and intermittent renewables • New ancillary service products needed to create market incentives for conventional resources to balance the intermittent output from renewables in real-time • Market signals for fuel assurance increasingly important • Transmission expansion necessary to enhance reliability and integrate renewables • Continued analysis of gas trading liquidity, pipeline access, and operational transparency
Integration of Distributed Energy Resources	• Public policies favor deployment of DERs to improve system efficiencies and address reliability concerns • Utility demonstration projects and Distribution System Integration Plans taking shape • Utility ratemaking reshaped to incentivize DER investment • DERs seeking multiple revenue streams to improve project economics • DER technology requires enhancements to system and market integration	• NYISO engagement with market participants and policymakers necessary to assess implications and value of DERs • Enhanced coordination between bulk power system and distribution systems increasingly important • Enhanced tools and visibility necessary to ensure market efficiency and system reliability • DER integration into system operations could have significant impact on IT systems needs
Integration of Public Policy	• Public policy imperatives increasingly influencing markets, operations, and planning • Jurisdictional uncertainty between state and federal regulators	• Carbon policies promote “winners” outside of market signals, creating tensions between clean energy goals and reliability • Transmission expansion may not materialize to the extent the NYISO deems sufficient to address clean energy goals • Carbon Pricing to internalize the cost of carbon, may be increasingly useful to harmonize policy and markets, and minimize out-of-market incentives for clean energy • Regulatory uncertainty for NYISO and its Market Participants

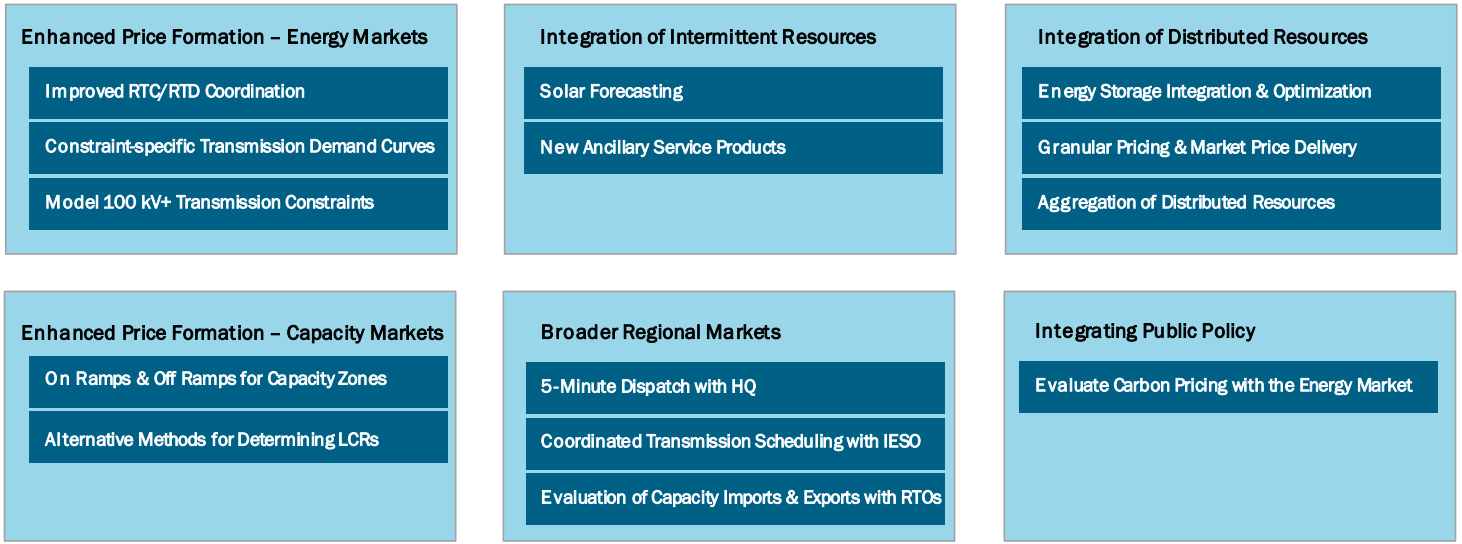
Broader Context for Strategic Initiatives

	Themes & Trends	Implications
Technology & Infrastructure Investment	• ABB is retiring the existing EMS/BMS platform • Physical and cyber security threats are increasing in quantity and complexity • Applications and underlying systems are increasing in complexity and criticality as new business capabilities continue to be added • Industry research and development around Smart Grid and DERs continue to advance • Cloud Computing advances continue to impact traditional business models and supporting IT systems and services	• Necessary upgrade of the EMS/BMS system to support continued operations while introducing new capabilities for future business requirements • Improvements in physical and cyber security are necessary to protect business operations from increasing threats • Application architecture, development, and testing methodologies need to continue to improve in order to provide new business capabilities • Analysis and modification to existing systems (including the implementation of new technology) is needed to support Smart Grid and DER efforts. • Organizational adaptation is required to use new cloud services effectively and to deal with software and hardware providers now using cloud computing models in their product offerings
Sustainable Business Model	• Flat/negative load growth resulting from efficiency efforts, DERs • Growing role of renewables and DERs will add complexity to market designs, system operations and planning while increasing IT needs	• Increased pressure on cost reductions to maintain streamlined operations • Mounting political pressure and challenges to NYISO's ability to carry out core functions • Requires examination of staffing needs, budget strategies, organizational funding and cost allocation mechanisms

Reliability through Markets

Priority Projects in Support of Strategic Initiatives

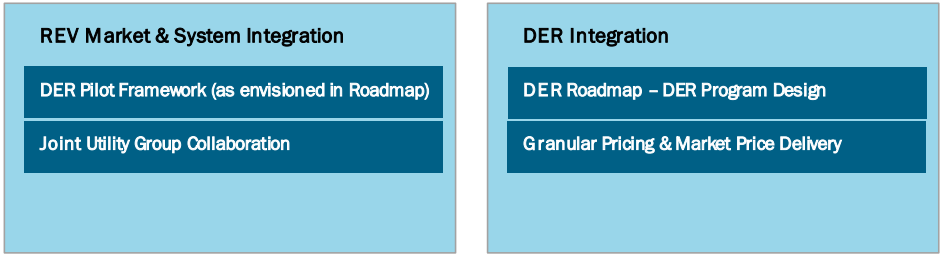
- A guiding principle of the NYISO's market design is for market rules to reinforce reliable operation of the grid. Limit out-of-market elements and promote price transparency leading to efficient market outcomes.



Integration of Distributed Energy Resources

Priority Projects in Support of Strategic Initiatives

- Technological advancements and public policies, particularly 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. We believe that opening the NYISO's markets to DERs will improve the strength and efficiency of the electric grid.



Integration of Public Policy

Priority Projects in Support of Strategic Initiatives

- The New York Clean Energy Standard sets the stage for aggressive state action to reduce greenhouse gas emissions and promote expansion of renewable and distributed energy resources. The NYISO is taking steps to harmonize the wholesale market design with state public policy goals.

Expansion of Renewables & Clean Power

- Large Solar Participation Model
- Load Forecasting Upgrade & Build-Up
- Energy Storage Integration & Optimization
- Integration of Public Policy – Solar & Wind
- HQ 5-Minute Scheduling

Evolution of Transmission System

- Public Policy Transmission Planning Expansion

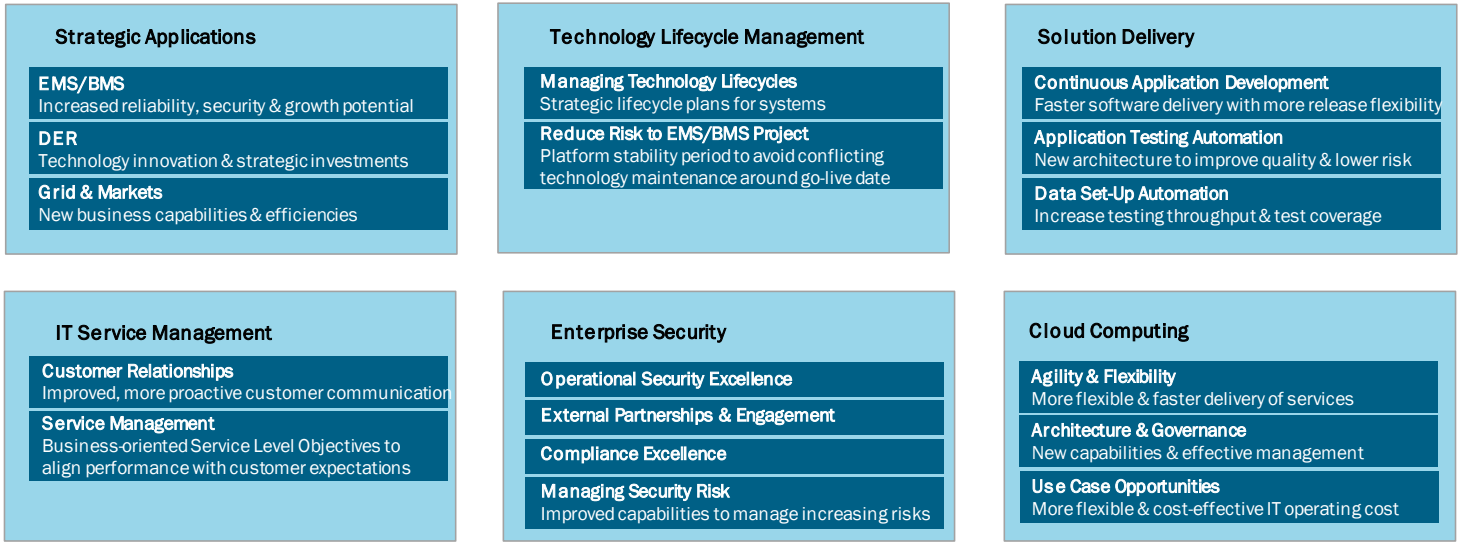
Additional Initiatives

- Evaluating Carbon Pricing in the Energy Market
- New Ancillary Service Products
- Interconnection Process Improvements

Technology & Infrastructure Investment

Priority Projects in Support of Strategic Initiatives

- **The technology investments outlined in the IT Strategy and various projects will position the NYISO to comprehensively respond to emerging industry trends like the integration of renewable 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 and demand for new business capabilities.**



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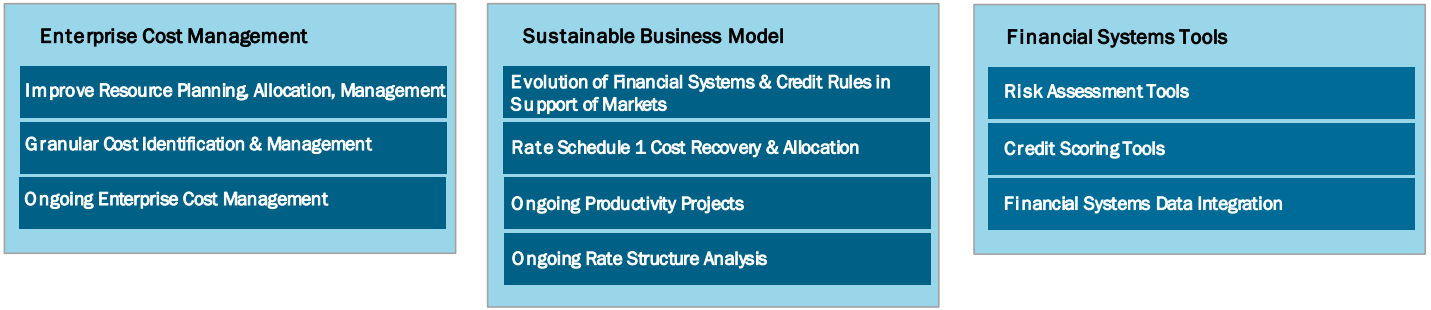
Sustainable Business Model

Priority Projects in Support of Strategic Initiatives

- The NYISO will position itself to operate increasingly complex systems and proactively advance their application in an environment of increased cost pressure. The NYISO is focused on managing increasing costs in an environment of decreasing MWH throughput and having stakeholders recognize the value of the services provided by the NYISO.



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.