

Master Plan

September Draft

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BPWG

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Agenda

- **Background**
- **September Draft Updates**
- **Timeline**
- **Appendix I**
 - 2020 Master Plan Process
- **Appendix II**
 - 2020 Master Plan – Strategic Initiatives and Key Themes
- **Appendix III**
 - 2020 Master Plan – Proposed Project Timelines

Background

Background

- The Master Plan was first developed in 2018 and is updated annually
- The Master Plan provides a multi-year vision for future NYISO enhancements
 - It is intended to provide a comprehensive 5-year plan that will enable the NYISO to prepare for anticipated changes to the bulk power system
 - The document serves multiple purposes including providing valuable information for the NYISO's project prioritization and strategic planning processes



Background

- **In response to stakeholder feedback on prior plans, the 2020 Master Plan includes a number of features to improve readability and clarity**
 - The NYISO will provide a cohesive narrative, while avoiding reiteration of unnecessary project information that is already included within project candidate descriptions
 - Describe how each individual project will support grid reliability and market efficiency
 - Compare and contrast the projects in terms of the level of effort, and the benefit that each will provide for the grid
 - Provide a potential timeline for stakeholders
- **Today, the NYISO will discuss the updated draft of the Master Plan posted with today's meeting materials**

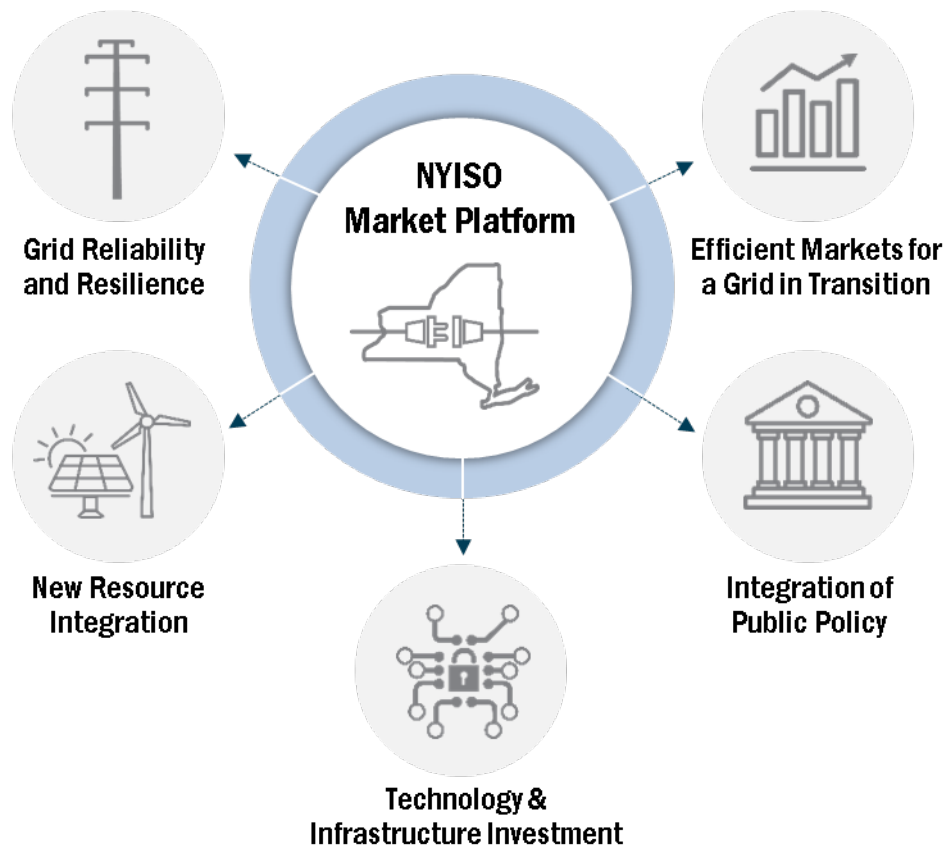
2020 Master Plan Structure

- The 2020 Master Plan derives the strategic initiatives discussed from the NYISO's 2020-2024 Strategic Plan*
 - The projects discussed in the 2020 Master Plan are grouped under the applicable strategic initiatives



*Link to the Strategic Plan: <https://www.nyiso.com/documents/20142/2225883/2020-Strategic-Plan.pdf/e282579c-9988-3ff6-5164-dfea1abfbc13?t=1576765917219>

NYISO Strategic Initiatives



2020 Master Plan Structure

- **Strategic Initiatives and Key Themes**
 - Grid Reliability and Resilience
 - Efficient Markets for a Grid in Transition
 - New Resource Integration
 - Integration of Public Policy
 - Technology and Infrastructure Investment
- **Proposed project timelines**
- **Potential grid benefits, NYISO effort, and project dependencies**

September Draft Updates

September Draft Updates

- **The slides that follow provide a highlight of revisions to the Master Plan since the most recent draft; not all revisions are described in this presentation.**
 - The Master Plan draft is posted with today's meeting materials.

September Draft Updates

■ Throughout the paper

- The graphics highlighting the strategic initiatives and key themes were updated.
- Timeline revisions are reflected throughout the Master Plan where applicable.
- Revisions to grid benefit and NYISO effort have been updated where applicable.

September Draft Updates

■ Strategic Initiatives and Key Themes

- Update the description of the Climate Change Impact and Resilience Study to include the Grid in Transition project, reflecting that these two efforts have been merged into the *Climate Change and Grid in Transition* project.
- *Expanding Peak Hour Forecasts* was included as a project within the Master Plan under the key theme of Capacity Markets and Alignment.
- The Hybrid Storage Model effort has been split into two projects. *Hybrid Co-Location Model* and *Hybrid Aggregation Model* are now described within the Master Plan.
- *CRIS Expiration Evaluation* was included as a project within the Master Plan under the key theme of New Resource Entry.

September Draft Updates

■ Overall Project Timelines

- Project timelines, shown in Appendix III, have been updated with the most recent information.

September Draft Updates

■ Potential Benefits, NYISO Effort, and Project Dependencies

- Include *Climate Change and Grid in Transition* in this section, reflecting the merging of Grid in Transition with the Climate Change Impact and Resilience Study.
- Include that the implementation milestone for *Constraint Specific Transmission Shortage Pricing* is anticipated for 2022 or 2023, depending on the complexity of the final market design.
- Clarify that *Reserve Enhancements for Constrained Areas* should be completed before *More Granular Operating Reserve*.
- Include a description of *Expanding Peak Hour Forecasts* in this section.
- Include a description of *Hybrid Co-Location Model* and *Hybrid Aggregation Model* in this section.
- Include a description of *CRIS Expiration Evaluation* in this section.

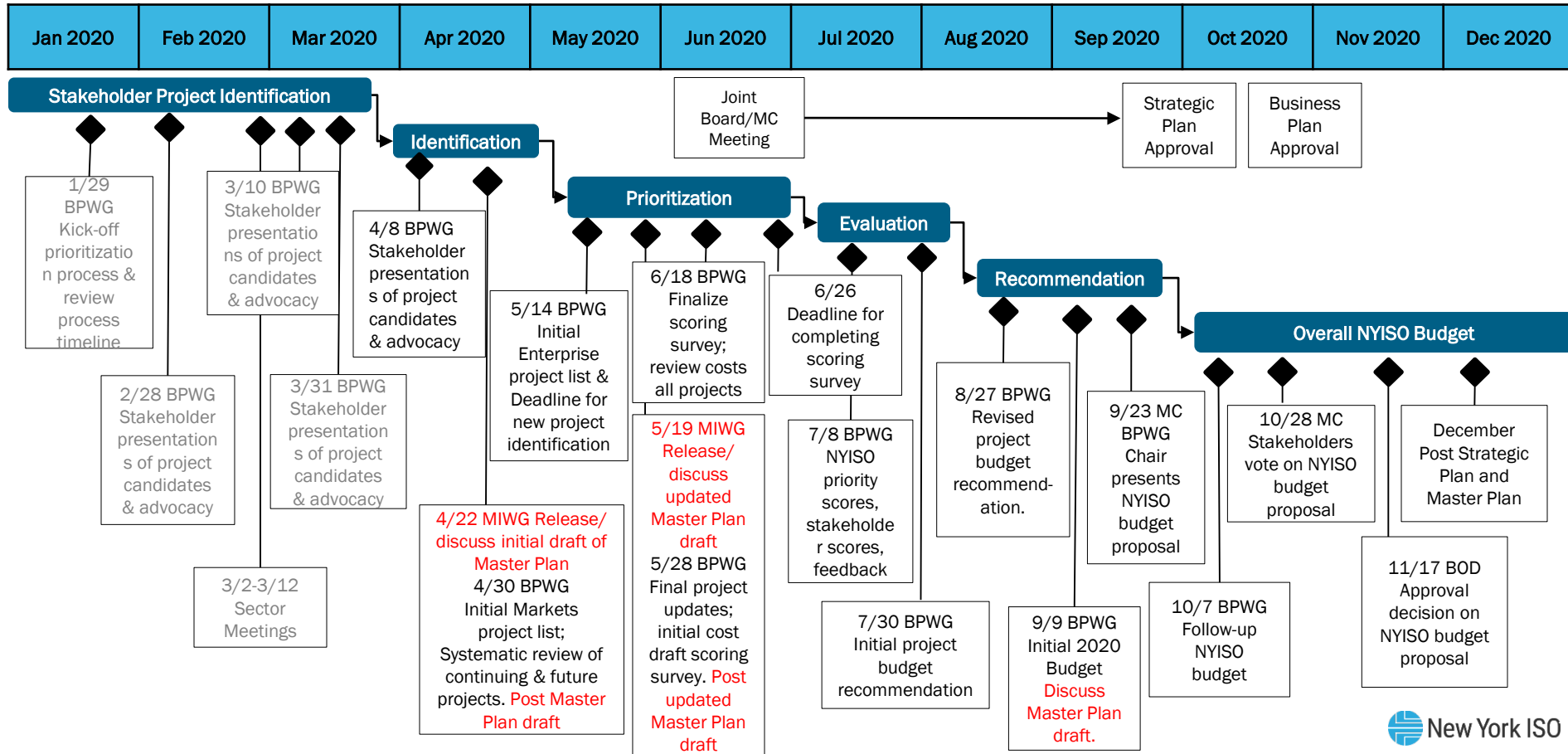
Timeline

Master Plan Timeline

- ✓ **March 2020 – Meet with each governance sector to get initial feedback**
- ✓ **April 22, 2020 (MIWG) – Release and discuss the initial draft of the Master Plan**
- ✓ **April 30, 2020 (BPWG) – Release the initial draft of the Master Plan (no discussion)**
- ✓ **May 19, 2020 (MIWG) – Release and discuss updated draft**
- ✓ **May 28, 2020 (BPWG) – Release updated draft (no discussion)**
- **September 9, 2020 (BPWG) – Release and discuss near final draft of the Master Plan**
- **December 2020 – Release final Master Plan**

All updates to the Master Plan will be coordinated with the overall project prioritization process

2021 Proposed Project Prioritization Timeline



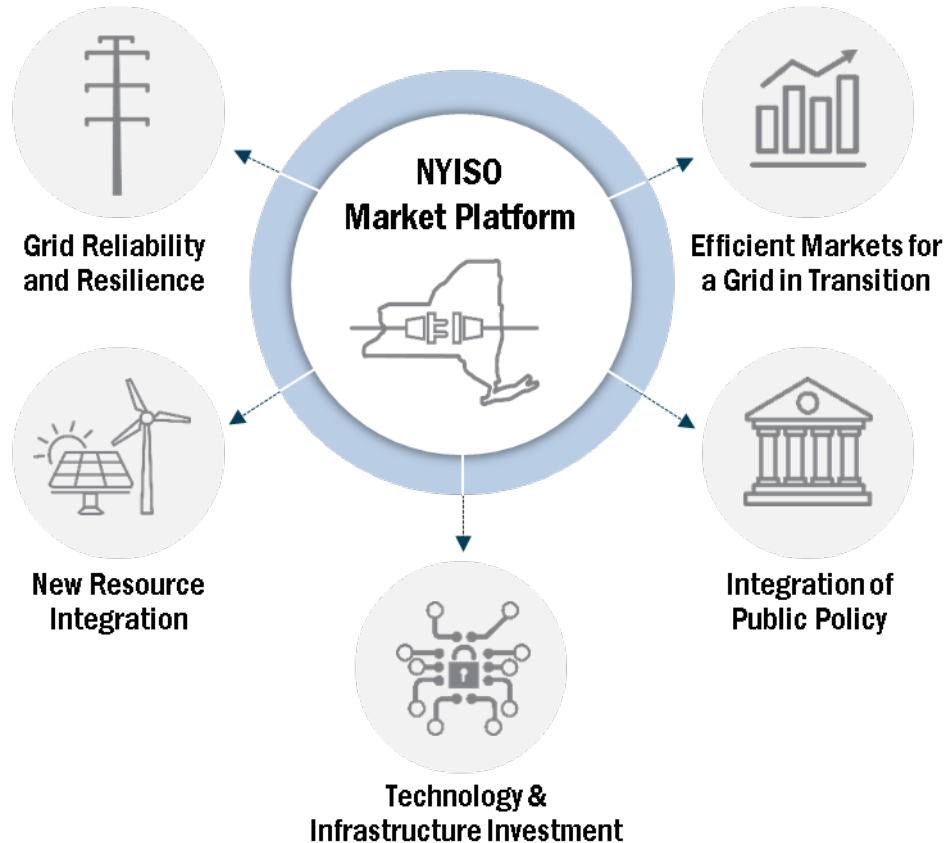
Appendix I: 2020 Master Plan Process

Master Plan Process

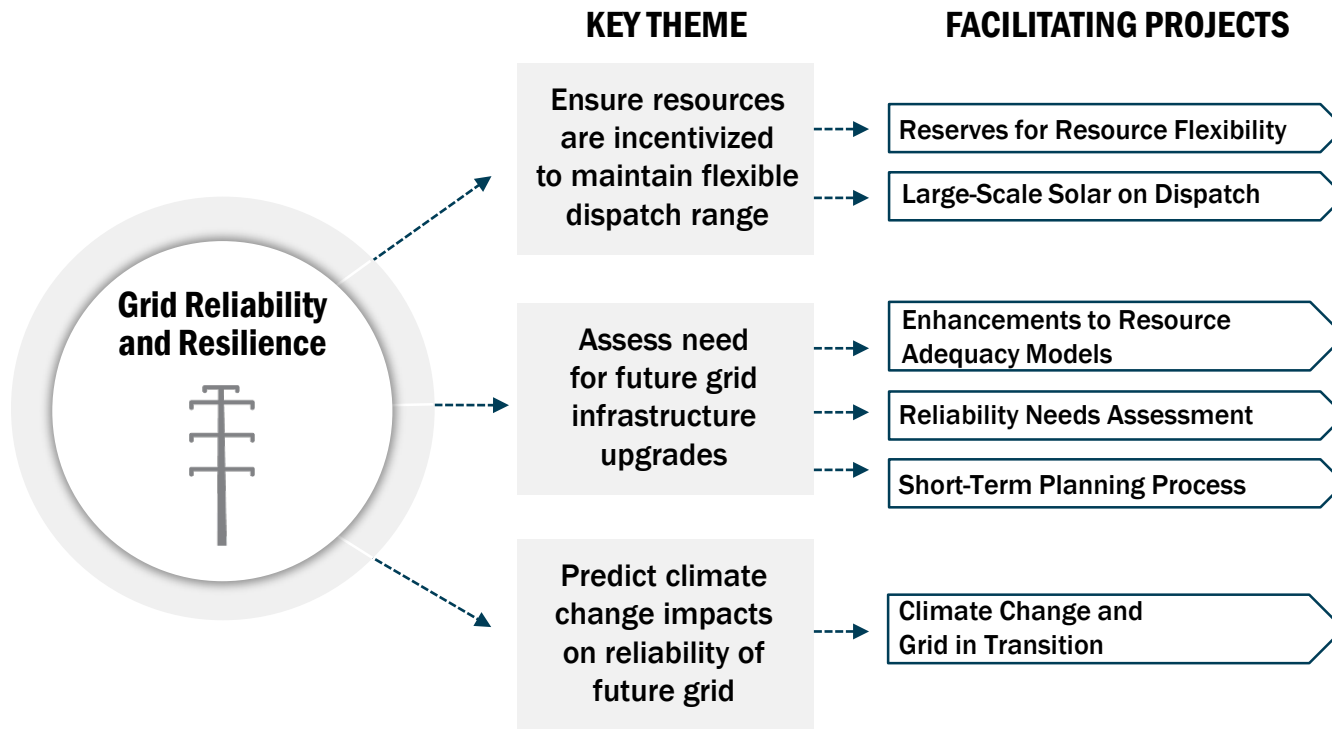
- **The Master Plan starts with receiving feedback at each of the Sector Meetings**
- **An initial draft of the Master Plan will be produced in mid-April**
 - This draft is intended to share NYISO's initial thoughts based on Sector Meeting feedback
- **An updated draft of the Master Plan will be produced near the end of May**
 - This draft will incorporate additional feedback and identify costs and benefits
- **A near final draft of the Master Plan will be produced near the end of August**
 - This draft will incorporate any changes as a result of the project prioritization and the budget process
- **A final Master Plan will be produced near the end of the year**
 - This final version will incorporate any changes from the final approved budget

Appendix II: 2020 Master Plan – Strategic Initiatives and Key Themes

NYISO Strategic Initiatives



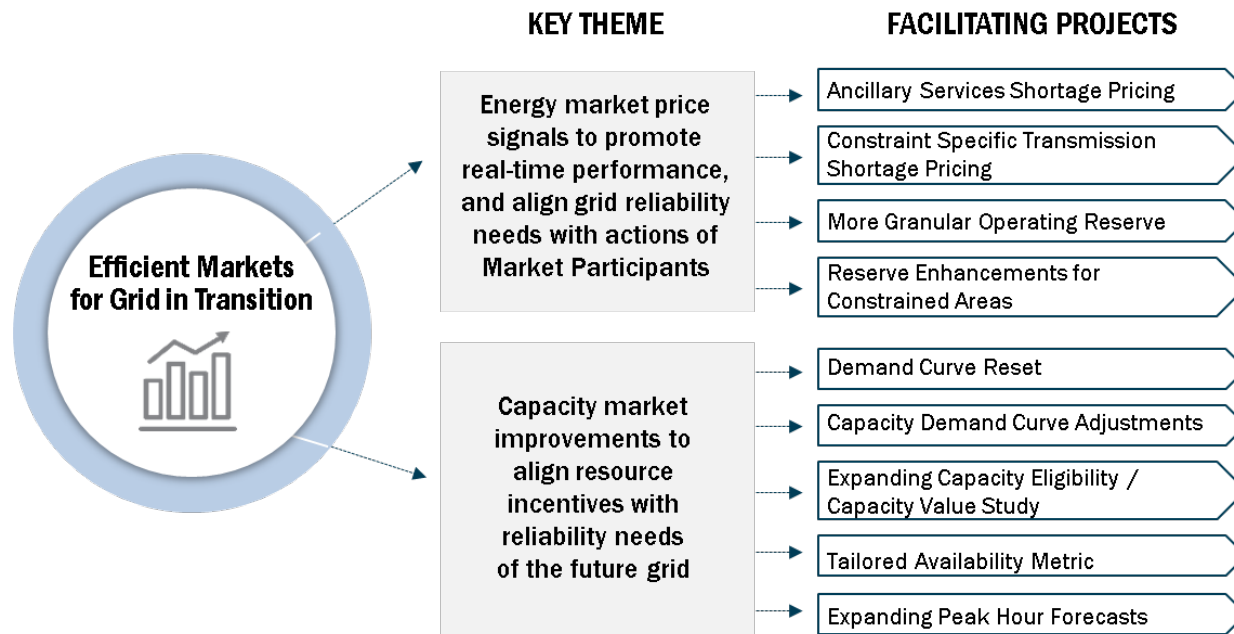
Grid Reliability and Resilience



Grid Reliability and Resilience

Grid Reliability and Resilience		Description
	Incentives for Flexible Dispatch	
1	Reserves for Resource Flexibility	Proposes to expand the procurement of operating reserves in the Southeastern New York (SENY) reserve region
2	Large-Scale Solar On Dispatch	The NYISO recommends that wholesale market solar resources be treated similarly to wind resources. This would require solar plants to submit flexible offers that indicate their willingness to generate at various price levels, and to receive and respond to economic dispatch instructions to curtail output.
	Future Infrastructure Upgrades	
3	Enhancements to Resource Adequacy Models	Evaluate the robustness of the probabilistic reliability models used to support NYCA reliability and in the NYISO markets, and making updates as needed to reflect emerging technologies and changing system dynamics.
4	Reliability Planning Process	The Reliability Planning Process (“RPP”) is the NYISO’s biennial process to identify reliability needs and, if necessary, select solutions to resolve the needs. The first phase of the RPP is the Reliability Needs Assessment (“RNA”) that assesses future resource adequacy and transmission security needs for the New York State Bulk Power Transmission Facilities (“BPTF”) in accordance with applicable Reliability Criteria. If the BPTF does not meet the applicable Reliability Criteria, then Reliability Needs would be identified.
5	Short-Term Planning Process	A new Short Term Reliability Process (“STRP”) was developed and approved as part of the 2019 stakeholder process. The STRP was approved by the NYISO Board in January 2020 and filed with FERC in February. The STRP builds on the existing Generator Deactivation process by evaluating and addressing Reliability Needs on the BPTF resulting from Generator Deactivations as well as resulting from other changes on the electric grid, such as load and transmission changes.
	Climate Change Impacts	
6	Climate Change and Grid in Transition	The Climate Change Impact and Resilience Study is being merged with the Grid in Transition project. The <i>Climate Change and Grid in Transition</i> project seeks to identify means of addressing the state’s goals and mandates in a cost-effective way while continuing to reliably serve load in New York. This project will also contemplate the impacts of climate change itself on the reliability of the future grid.

Efficient Markets for a Grid in Transition



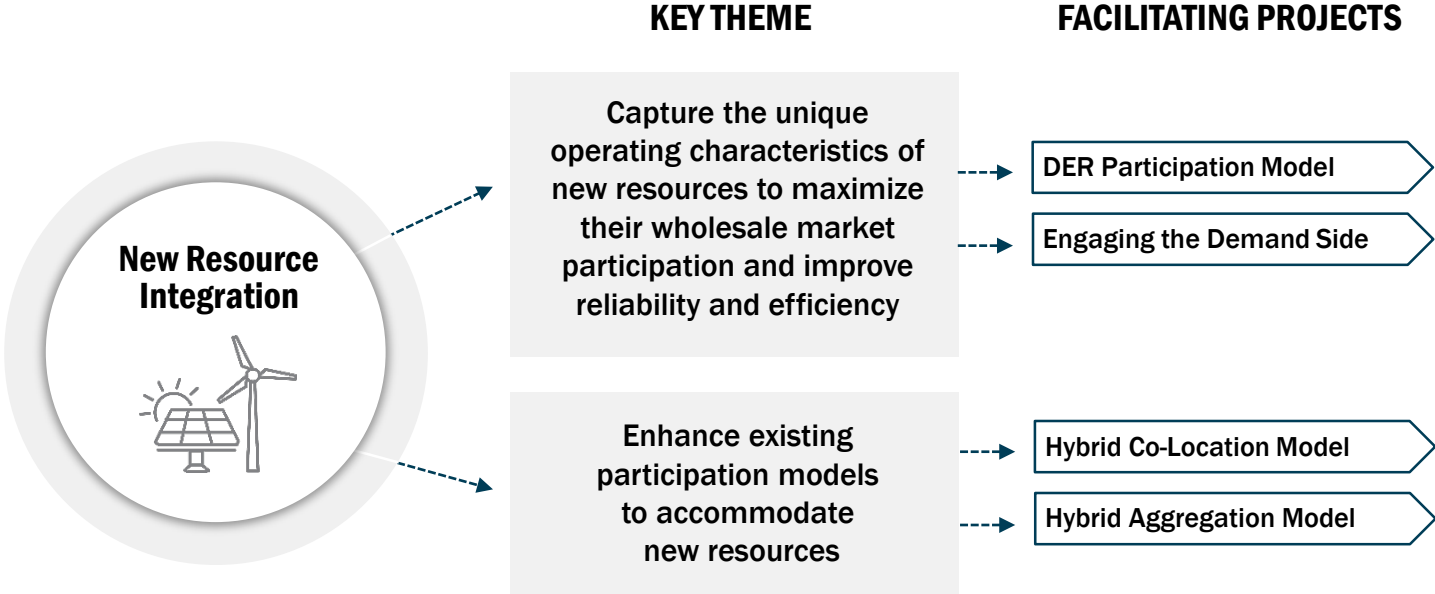
Strategic Initiatives and Key Themes

Efficient Markets for a Grid in Transition

Efficient Markets for a Grid in Transition		Description
Performance and Alignment		
7	Ancillary Services Shortage Pricing	The purpose of this project is to evaluate the NYISO's Ancillary Services shortage pricing values, considering the operator actions taken to maintain operating reserve requirements, market incentives necessary to maintain flexibility, and payment incentives in neighboring markets, especially pay-for-performance capacity market designs.
8	Constraint Specific Transmission Shortage Pricing	Improve resource scheduling efficiency and investment signals by enhancing the way that constraints on the transmission system are priced in the NYISO's energy markets.
9	More Granular Operating Reserve	Implementing reserve requirements within certain New York City load pockets that would better represent the value of short-notice responsive resources in desirable locations.
10	Reserve Enhancements for Constrained Areas	Dynamically procure Operating Reserves based on system needs and transmission capabilities, which will enable Operating Reserves to be scheduled more efficiently in constrained areas.
Capacity Markets and Alignment		
11	Demand Curve Reset	Every four years, the NYISO, along with its stakeholder community, conducts this comprehensive review to determine the parameters used in establishing the Installed Capacity (ICAP) Demand Curves.
12	Capacity Demand Curve Adjustments	This effort includes exploring alternative slopes and shapes of the ICAP Demand Curves that may help stabilize capacity market pricing outcomes and improve the predictability of future market revenues as large quantities of new resources are deployed across New York State in the coming years.
13	Expanding Capacity Eligibility/Capacity Value Study	Assess the changes to the reliability benefit of resources in the grid through time to continue to support reliable grid operations.
14	Tailored Availability Metric	This project will help the NYISO to maintain the availability and incentivize performance of capacity suppliers during peak operating conditions. The Tailored Availability Metric project addresses this by incentivizing resources to be available and perform during these critical operating periods.
15	Expanding Peak Hour Forecasts	This project will investigate the issues surrounding capacity obligation shares over multiple peak-type hours and use of gross rather than measured load to determine peak load hours for purposes of the IRM study and the ICAP market forecast.

Strategic Initiatives and Key Themes

New Resource Integration

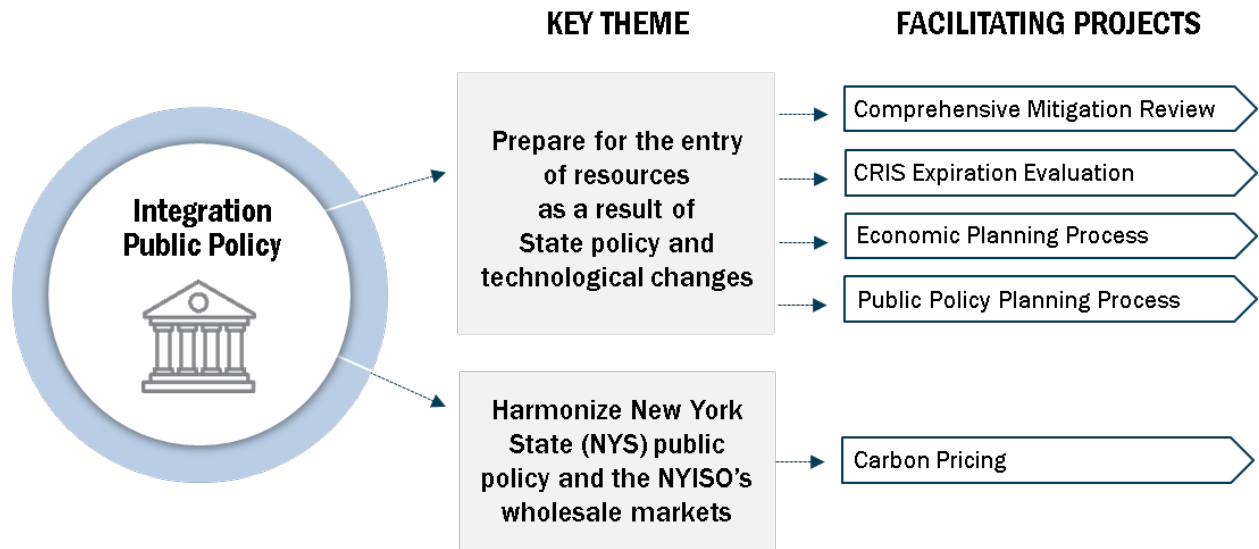


Strategic Initiatives and Key Themes

New Resource Integration

New Resource Integration		Description
	Wholesale Market Participation	
16	DER Participation Model	Harmonize New York's REV goals and compliance with FERC Order Nos. 719, 745 and 841, while simplifying the operational matrix of rule sets for product offerings of both demand response and distributed resources, for all stakeholders involved.
17	Engaging the Demand-Side Participation Model Enhancement	Controllable and flexible load can help to balance inflexible/intermittent supply and provide Ancillary Services.
18	Hybrid Co-Location Model	The NYISO's current rules do not accommodate co-located resources with an output capability beyond their interconnection point limit. <i>Hybrid Co-Location Model</i> will allow co-located resources to continue to be separate resources, but also allow the resources to share a scheduling constraint that limits the combined output from both resources at the interconnection limit.
19	Hybrid Aggregation Model	The <i>Hybrid Aggregation Model</i> project will consider allowing co-located resource participation as a single PTID with the application interconnection limit.

Integration of Public Policy

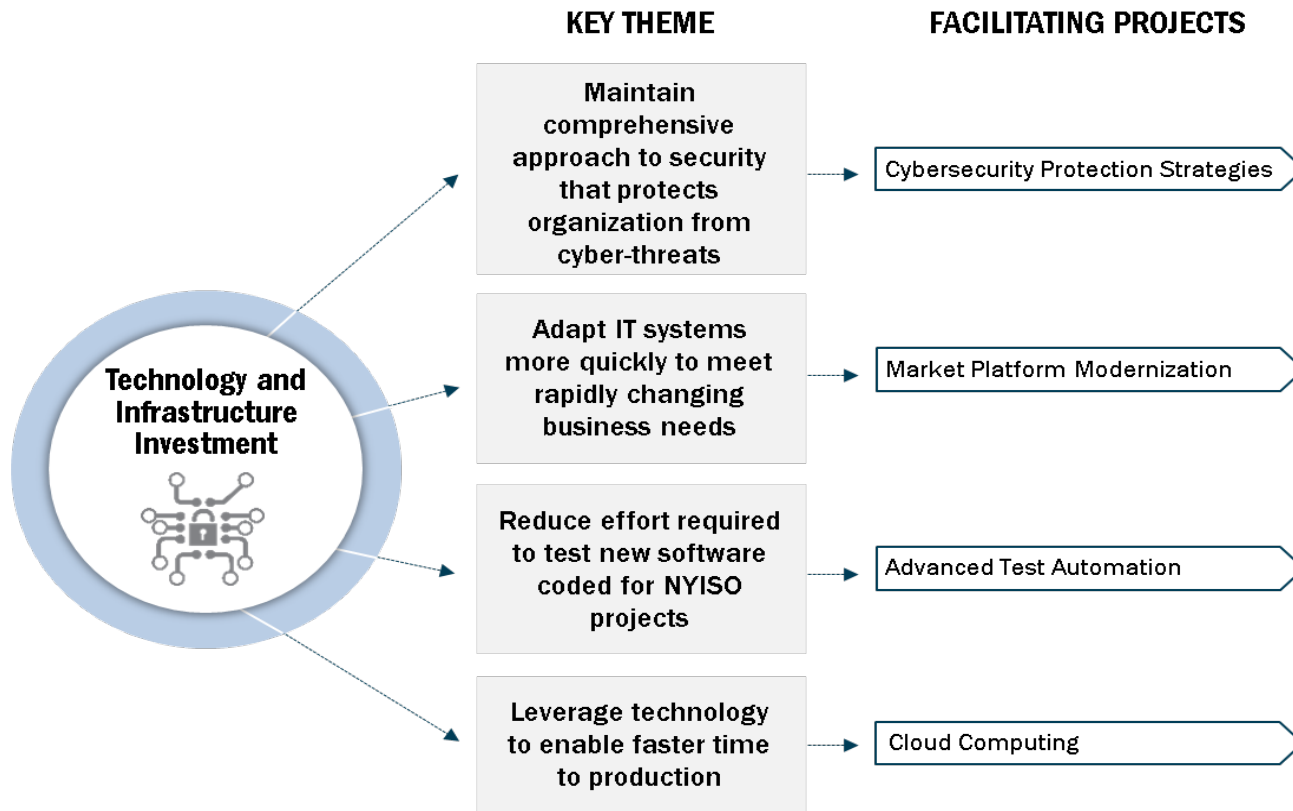


Strategic Initiatives and Key Themes

Integration of Public Policy

Integration of Public Policy		Description
	New Resource Entry	
20	Comprehensive Mitigation Review	Will allow the NYISO to further prepare for the entry of resources as a result of State policy and technological changes.
21	CRIS Expiration Evaluation	As part of <i>CRIS Expiration Evaluation</i> , the NYISO will investigate opportunities to make the rules addressing CRIS retention more stringent in cases where CRIS is not fully utilized.
22	Economic Planning Process	The purpose of the CARIS studies is to identify whether transmission build-out or the introduction of other resources is economic based on forecasted congestion costs within the NYISO market.
23	Public Policy Transmission Planning Process	The NYISO's Public Policy Transmission Planning Process is the means by which the NYISO addresses transmission needs that are driven by Public Policy Requirements
	Public Policy and Market Harmonization	
24	Carbon Pricing	Seeks to harmonize New York State (NYS) public policy and the NYISO's wholesale markets by incorporating the social cost of carbon dioxide ("carbon") emissions when scheduling resources through the energy markets.

Technology and Infrastructure Investment



Strategic Initiatives and Key Themes

Technology and Infrastructure Investment

Technology and Infrastructure Investment		Description
25	Cybersecurity Protection Strategies	The NYISO views cyber and physical security as a crucial component of its strategic plan, and invests significant time and resources to maintain a comprehensive approach to security that protects the organization and allows it to fulfill its mission to reliably operate the electric grid and wholesale electricity markets in New York State.
26	Market Platform Modernization	The goal of this IT strategic initiative is to optimize the market platform to be adapted quickly and safely to enable the NYISO to be responsive to the emerging business needs of a grid in transition.
27	Advanced Test Modernization	The goal of this IT strategic initiative is to reduce the time and effort required to validate software changes
28	Cloud Computing	This IT strategic initiative focuses on building capabilities that will allow the NYISO to effectively manage the cost, risk, and efficiency of cloud based services.

Appendix III: 2020 Master Plan Proposed Project Timelines

Strategic Initiatives and Key Themes

Grid Reliability and Resilience

Grid Reliability and Resilience		2020	2021	2022	2023	2024	2025
	Incentives for Flexible Dispatch						
1	Reserves for Resource Flexibility	MDC	DEP				
2	Large-Scale Solar On Dispatch		DEP				
	Future Infrastructure Upgrades						
3	Enhancements to Resource Adequacy Models		Ongoing				
4	Reliability Planning Process	Ongoing					
5	Short-Term Planning Process	DEP	Ongoing				
	Climate Change Impacts						
6	Climate Change and Grid in Transition	Ongoing					

Strategic Initiatives and Key Themes

Efficient Markets for a Grid in Transition

Efficient Markets for a Grid in Transition		2020	2021	2022	2023	2024	2025
	Performance and Alignment						
7	Ancillary Services Shortage Pricing	MDC	DEP				
8	Constraint Specific Transmission Shortage Pricing		MDC	DEP			
9	More Granular Operating Reserve			MDC	DC	DEP	
10	Reserve Enhancements for Constrained Areas		SC	FR	DC	DEP	
	Capacity Markets and Alignment						
11	Demand Curve Reset	SC	DEP		SD	SC	DEP
12	Capacity Demand Curve Adjustments			SC			
13	Expanding Capacity Eligibility/Capacity Value Study	DC	DEP	SD	SC		DEP
14	Tailored Availability Metric	MDC	DEP	SD	SC		DEP
15	Expanding Peak Hour Forecasts		CP				

Strategic Initiatives and Key Themes

New Resource Integration

New Resource Integration		2020	2021	2022	2023	2024	2025
	Wholesale Market Participation						
16	DER Participation Model	SD	SD	DEP			
17	Engaging the Demand-Side		ID	SD	SC	CP	CP
	Participation Model Enhancement						
18	Hybrid Co-Location Model	MDC	DEP				
19	Hybrid Aggregation Model		MDC	FR	DEP		

Strategic Initiatives and Key Themes

Integration of Public Policy

Integration of Public Policy		2020	2021	2022	2023	2024	2025
	New Resource Entry						
20	Comprehensive Mitigation Review	MDC/DEP	MDC/DEP				
21	CRIS Expiration Evaluation		CP	MDC			
22	Economic Planning Process	Ongoing					
23	Public Policy Transmission Planning Process	Ongoing					
	Public Policy and Market Harmonization						
24	Carbon Pricing	FR	SD				

Strategic Initiatives and Key Themes

Technology and Infrastructure Investment

Technology and Infrastructure Investment		2020	2021	2022	2023	2024	2025
25	Cybersecurity Protection Strategies	Ongoing					
26	Market Platform Modernization	Ongoing					
27	Advanced Test Modernization	Ongoing					
28	Cloud Computing	Ongoing					

Our mission, in collaboration with our 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 policymakers, stakeholders and investors in the power system

