

2014 Annual Report of the Consumer Interest Liaison



New York Independent System Operator



The mission of the NYISO, 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*

Table of Contents

Message from the Consumer Interest Liaison	2
Introduction	3
NYISO Governance.....	5
Access to NYISO Management and Board of Directors	7
Formation and Objectives of the Consumer Interest Liaison.....	7
Actions Taken by the NYISO in Response to the Consumer Advisory Council’s Recommendations	9
Consumer Impact Analysis	13
Consumer Impact Analysis for 2014.....	15
Consumer Impact Analysis: Comprehensive Shortage Pricing.....	15
Background/Overview	15
Benefits of Implementing Comprehensive Shortage Pricing	15
Consumer Impact Analysis.....	16
Cost Impact Market Efficiencies.....	16
Step 1: Impact on Market Efficiencies.....	16
Step 2: Decrease in Capacity Costs	18
Step 3: Additional Potential Cost Impacts.....	18
Reliability Impact	20
Environment Impact	20
Impact on Transparency	20
Topics for Consumer Impact Analysis: 2014	20
Scheduling & Pricing: Comprehensive Scarcity Pricing	20
Fuel Assurance: Market Design Concepts.....	21
Behind the Meter: Net Generation Model	21
Possible Mechanisms to Determine the Need for Elimination of Capacity Zones.....	21
SCR Performance Obligations: Change Minimum Performance Obligation from Four to Six Hours.....	21
Criteria for Including Mothballed Units in the Forecast for Buyer-Side Mitigation Determinations.....	22
2015 Major NYISO Efforts	22
Incorporating Coordinated Transaction Scheduling (CTS) with ISO-NE.....	21
Broader Regional Markets	22
Energy Market Developments	23
Fuel Assurance.....	24
Demand Response.....	25
Distributed Energy Resources	25
Endnotes.....	27



MESSAGE FROM THE CONSUMER INTEREST LIAISON

The 2014 Annual Report is the fourth time we will be reporting on the activities of the Consumer Interest Liaison since my appointment to that position in October 2011.¹ Last year we made some changes to the weekly summaries of committee and working group meetings that we hope representatives of the End Use Sector found helpful. Rather than cover the written presentations that are posted, in our summaries we focused more on the discussion and the NYISO's response to stakeholder questions. We also continued to post the weekly summaries on the Consumer Interest Liaison webpage so that all stakeholders have access to them. Monthly meetings with representatives of the End Use Sector took place on a regular basis. These calls focused on the topics that committees and working groups expected to discuss over the next two months. We also continued to respond to inquiries from the End Use Sector that we received from time to time, and also to send out email reminders of events and activities at the NYISO.

Although 2014 was a very busy year with the NYISO completing a record 47 projects, many of the projects identified for Consumer Impact Analyses did not progress to the point where we could conduct an impact analysis. As a result, many of these analyses will take place during 2015. Another project identified for Consumer Impact Analysis last year, Market Rule Changes for Demand Response Performance Obligations, was put on hold due to the potential Supreme Court hearing on Demand Response in wholesale markets. We performed a Consumer Impact Analyses of Comprehensive Shortage Pricing that was completed and approved during 2014. The results of the impact analysis are fully discussed in this report. Additionally, in this report we discuss the actions taken by the NYISO in response to the recommendations of the Consumer Advisory Council. Finally, we briefly discuss some of the major issues that the NYISO will be working on during 2015.

We anticipate another busy and exciting year. This report briefly describes the projects that we have identified for consumer impact analysis for 2015. We look forward to continue our role of supporting the work of the End Use Sector.

Tariq N. Niazi
Consumer Interest Liaison
New York Independent System Operator
May 2015

INTRODUCTION

The end of 2014 marked more than 15 years of the New York Independent System Operator (NYISO) running New York State’s bulk power electrical system. Since December 1, 1999, NYISO has been responsible for the reliable and efficient operation of the electrical grid and the associated wholesale markets that serve New York State consumers. The Eastern Interconnection, which is the electrical grid serving the Eastern half of the United States from the East Coast to the Rocky Mountains, has been described as the largest, most complicated machine ever built. Utilizing a competitive marketplace, the NYISO coordinates the supply of reliable and cost efficient electricity to all New York State end users.

A major objective of the NYISO is to provide wholesale electricity to consumers at the lowest overall production cost, but the complexity of the markets makes it difficult for consumers to effectively participate in the organization’s shared governance structure. Consumer representatives lack the resources to attend the numerous committees and working group meetings, and thoroughly research and analyze the available information. To address these issues the NYISO has developed initiatives that “level the playing field” for consumer representation.

One of these initiatives was to establish the position of Consumer Interest Liaison. The Consumer Interest Liaison assists representatives of end use consumers to enhance their participation in the NYISO governance process. The Consumer Interest Liaison position:

- *Assists end use consumers in gaining valuable insight into proposed system changes*
- *Provides consumers a communication link with the NYISO Board and Senior Management*
- *Provides consumers with the short term and long term impact of NYISO initiatives and changes*
- *Improves education and outreach with end use consumers*
- *Improves overall transparency of NYISO actions and processes*

To fill this position, the NYISO named Tariq Niazi as the Consumer Interest Liaison in 2011. Mr. Niazi brought 30 years of experience with him from the New York State Consumer Protection Board (CPB). Mr. Niazi’s experience as the former director of the CPB Utility Intervention Unit and Chief Economist uniquely qualifies him to assist New York’s electricity consumers in understanding the complexities of the NYISO marketplace.



In the years following the Consumer Interest Liaison appointment, the NYISO has devoted numerous resources to enhancing the participation of end use consumer representatives in the NYISO governance process. Through several channels of regular communication and detailed Consumer Impact Analyses, the end use consumer representatives have a better opportunity to understand and participate in NYISO governance decisions.

This report will highlight the projects and initiatives undertaken by the NYISO's Consumer Interest Liaison during 2014.

NYISO Governance

Stakeholders, including end use consumer representatives, play a significant role in decision making through the NYISO’s shared governance process. Stakeholders participate in NYISO’s governance through three standing committees: the Management Committee (MC), the Business Issues Committee (BIC), and the Operating Committee (OC). Each of these committees oversees their own working groups, task forces and subcommittees. These committees provide stakeholders the forums to discuss, debate and vote on issues regarding the administration of the markets, the operation of the New York’s bulk power system, and the planning for system reliability. In 2014, the NYISO conducted more than 250 meetings, including monthly sessions of the three standing committees and almost daily meetings of subcommittees, working groups, and task forces.

NYISO governing agreements establish specific responsibilities for all three standing stakeholder committees. These committees perform their responsibilities in accordance with their bylaws and in coordination with work performed by NYISO management and staff. Stakeholders are responsible for a range of duties in the shared governance process, including:

- *reviewing and recommending candidates for Board vacancies,*
- *developing and reviewing technical guidelines for the operation of the bulk power system,*
- *developing and reviewing enhancements to market design,*
- *developing and reviewing system planning reports; and,*
- *reviewing the preparation of and approving the NYISO’s annual budget.*

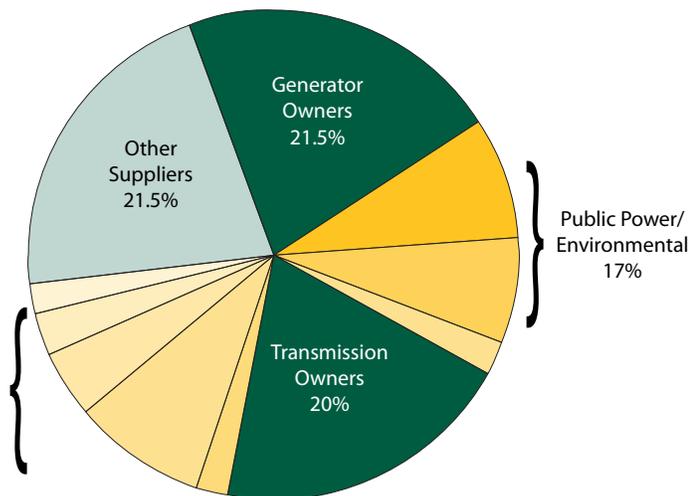
The NYISO stakeholders and the NYISO Board of Directors share the responsibility of developing and approving proposed changes to the NYISO’s governing documents and federally-approved tariffs. The Management Committee must endorse any proposed change to the NYISO’s governing documents before they can be approved by the Board of Directors and filed for review by the Federal Energy Regulatory Commission (FERC) under Section 205 of the Federal Power Act.² The FERC has noted the collaborative results of the NYISO’s shared governance system, stating in 2008, “The Commission commends NYISO and the stakeholders for working together to resolve many issues...”³

The participants of the NYISO market place are categorized into five stakeholder sectors including Transmission Owners, Generation Owners, Other Suppliers, End Use Consumers, and Public Power/Environmental interests. Sector representatives vote in the stakeholder committees. Each stakeholder's vote in a committee is equal to a percentage of its sector's allocated voting shares. Actions by the committees require a 58% vote of approval to pass. The voting shares in all three standing committees are allocated among the sectors and subsectors as follows:

- *Generation Owners - 21.5%*
- *Other Suppliers - 21.5%*
- *Transmission Owners - 20.0%*
- *End Use Consumer - 20.0%*
 - ✓ Large Consumer (9.0)
 - ✓ Large Consumer – Government Agencies (2.0)
 - ✓ Small Consumer (4.5)
 - ✓ Government - Statewide Consumer Advocate (2.7)
 - ✓ Government - Small Consumer & Retail Aggregators (1.8)
- *Public Power and Environmental Parties - 17.0%*
 - ✓ State Power Authorities (8)
 - ✓ Municipal and Cooperatively Owned Electric Systems (7)
 - ✓ Environmental Parties (2)

In addition to stakeholders with voting rights, entities with significant interests in the NYISO markets may join the shared governance process as non-voting members. Further, staff of the New York State Public Service Commission (PSC) and the Federal Energy Regulatory Commission (FERC) regularly participate in and monitor issues addressed by the NYISO committees. Consumers have enjoyed a high degree of political efficacy in the NYISO shared governance structure. Consumer representatives over the past 15 years

NYISO Shared Governance Voting Sectors



have been aligned with MC majority decisions concerning market rules and other tariff changes. As noted above, the End Use Consumer sector controls 20% of the total voting weight, including a Statewide Consumer Advocate formally appointed by the NYISO Board of Directors. The State of New York also has a significant presence, with at least four state agencies or authorities participating as voting entities in the stakeholder process, and with non-voting participation by the New York State Public Service Commission. Together, End Use Consumers and state entities control 35% of the total voting weight at the NYISO Management Committee.

Access to NYISO Management and Board of Directors

Representatives of the End Use Sector regard access to the NYISO Board of Directors and Management as an important feature of NYISO governance. This access is provided to representatives of all sectors. The NYISO Board of Directors provides stakeholders the opportunity to meet on a monthly basis with Board Members and directly share their opinions and concerns. The Board Liaison Committee of the Management Committee conducts a meeting immediately following the NYISO Board of Directors' monthly meetings. The Liaison Committee meetings are a forum for open dialogue that offers Board Members an opportunity to gain insight into the concerns and interests of customers in the wholesale electricity markets. Additionally, the NYISO Board Members host an annual Joint Board/Management Committee meeting to review current issues with stakeholders.

Access is also critical to the Consumer Interest Liaison. To keep consumers informed in a timely and efficient manner, it is very important for the Consumer Interest Liaison to have access to NYISO resources. Mr. Niazi has direct access to NYISO Senior Staff and is afforded the cooperation of all NYISO departments, allowing the Consumer Interest Liaison to fully perform all necessary functions.

Formation and Objectives of the Consumer Interest Liaison

In an order issued in 2009, FERC directed all ISOs and RTOs to improve their “responsiveness to customers and stakeholders and ultimately the consumers who benefit from and pay for electricity services.”⁴ Support for this concept was further voiced by Market Participants at the 2010 Sector Meetings, and by the New York State Consumer Protection Board, the New York State Public Service Commission, and the NYISO Board of Directors at various other forums.



Stakeholders identified various areas for attention, including:

- *Expanded transparency of NYISO operations, markets and initiatives*
- *Enhanced ability of End Use Sector representatives to participate in NYISO governance by improving their understanding of the increasingly complex technical issues*
- *Expanded interaction and communication among NYISO Board, Senior Management and end-use consumers*
- *Increased sensitivity to the impact of its markets on consumers*
- *Increased information sharing about the NYISO, grid operation, markets, smart grid and initiatives*

In response to these requests, the NYISO developed and implemented a comprehensive, pro-active consumer program to provide both strategic and operational value to the NYISO and the consumers it serves. In May of 2011, the NYISO Board of Directors, responding to an appeal that would amend the NYISO tariffs to provide funding for a consultant to represent end use consumers in the NYISO stakeholder governance process and before regulatory bodies, voluntarily adopted several measures intended to enhance the voice of New York's end use consumers. The Board:

- *amended the NYISO's corporate mission statement to explicitly state that a core objective is to serve the public interest and provide consumer benefits;*
- *established the Consumer Interest Liaison to facilitate the flow of information between the NYISO and the End Use Sector, and to assist that sector to prioritize issues of interest as they are deliberated in the shared governance process;*
- *created an independent Consumer Advisory Council to provide the NYISO with recommendations as to how best to serve the interests of New York electricity customers; and,*
- *directed NYISO staff to assess the projected impacts of wholesale market initiatives, where appropriate, in order to further inform all stakeholders.*

In addition to the measures taken by the NYISO, FERC in October 2012 approved a New York State Public Service Commission (PSC) plan to allocate and distribute \$78 million in funds for the benefit of electric energy consumers resulting from a Stipulation and Consent Agreement between FERC and a NYISO market participant.⁵ The PSC plan called for a \$48 million refund to electric energy consumers, \$20 million to aid in the development of advanced technologies, and \$10 million to support consumer advocacy through the New York Department of State Utility Intervention Unit (UIU).

As part of that plan the New York Department of State is in the process of obtaining consultancy services to assist the UIU in promoting consumer interests in the NYISO governance process. The position is funded as a result of the settlement between FERC and Constellation Energy prior to its merger with Exelon. The position will assist the UIU in effectively representing the interests of end use consumers within New York's electric markets.

The PSC said its proposal was to “establish a long term funding mechanism to support comprehensive end-user advocacy at the NYISO and at FERC. Heightening the capabilities and strengthening the voice of the consumer at the NYISO should help in the development of new procedures or rules to identify and prevent market manipulations detrimental to consumers.”⁶

The Consumer Interest Liaison works closely with representatives of the End Use Sector and the New York State Department of Public Service staff to enhance and improve the support given to the New York consumers. It is anticipated that this role will continue to evolve as the markets and consumer needs change.

Actions Taken by the NYISO in Response to the Consumer Advisory Council's Recommendations

In 2011, as part of the NYISO's effort to develop and implement a more comprehensive and robust consumer program, the Board of Directors announced the creation of a 15-member Consumer Advisory Council (CAC). The CAC was charged with reviewing the role and responsibilities of the NYISO—examining the NYISO's strategic plan, researching developments in the electric industry, and providing the Board with a set of recommendations on how the NYISO could best serve the interests of New York State's end use consumers. The CAC held its inaugural meeting in August 2011 and issued its final recommendations to the NYISO Board of Directors in August 2013. Over the course of two years, the NYISO staff maintained an ongoing dialogue with the CAC that met in person semi-annually and multiple times via webinars and conference calls. On Sept. 6, 2013, the NYISO issued a response to all of the CAC recommendations. In this section of the Annual Consumer Report, we discuss the actions taken by NYISO as outlined in the NYISO's response.⁷ We only address CAC recommendations that required



a specific NYISO response/action. For ease of understanding, we first state the CAC recommendation and follow with the related action taken by the NYISO.

Recommendation 1.2) Facilitate additional consumer interaction with the NYISO to hear about strategic changes consumers perceive now and those consumers anticipate in the future.

The NYISO has identified “Public Website NYISO Budget and Value Proposition Pages” as a project candidate for 2015. Among other things, the Value Proposition page will develop portals on the public website to provide “easy to understand” information to consumers on the NYISO’s strategic initiatives and to provide consumers an avenue to comment on those initiatives.

Recommendation 1.4) Identify changes to each aspect of the industry, including consumers.

The NYISO meets and coordinates with the New York Department of Public Service and the Public Service Commission at several levels on policies that have a direct bearing on retail consumers and can influence NYISO priorities and strategic initiatives. These interactions include, but are not limited to, the following:

- *The NYISO President and CEO and the Chairperson of the Public Service Commission meet regularly;*
- *Senior NYISO staff meets regularly with senior Department of Public Service staff;*
- *The NYISO is coordinating with the Department of Public Service on its Reforming the Energy Vision (REV) efforts.*

Recommendation 2.2) Work to make the NYISO relevant and understood by end-use consumers by supporting activities such as: Providing web-based methods to provide relevant and timely information for end-use consumers such as web-based discussions; Offering a portion of the NYISO website specifically written to help end-use consumers; Offering periodic well publicized and readily available webinars on topics end-use consumers identify as important.

We will continue to improve our website with greater emphasis on providing relevant and timely information in a format tailored for retail end use consumers. We will also explore with representatives of the End Use Sector webinar topics that end use customers may find useful. Webinars could be added as a feature to the current market participant training programs and could potentially be offered to all customers, not just retail consumer interests.

Recommendation 3.2) The NYISO customer interface should be designed to accommodate a greater number of end-use consumer interactions.

Same as response to 1.2.

Recommendation 5.2) Facilitate the adoption of technologies such as distributed generation, community energy storage, smart grid technologies and micro grids.

A technical workshop took place on December 13, 2013, to foster discussion of Distributed Energy Resources (DER). Out of that conference the NYISO hired DNV GL (formerly KEMA) to conduct a study of behind-the-meter DER. A draft of the study was sent to stakeholders for their comments in July 2014. Stakeholder comments were due back in August, with the NYISO releasing the study soon after that.

Recommendation 6.2) The Council strongly encourages the NYISO to begin defining an agenda to progressively extract multiple benefits from this PMU network in advanced applications for existing reliability practices and to actively explore emerging new concepts that offer potential net benefits to New York consumers.

The NYISO completed the integration of the phasor network with its state-of-the-art video wall that was installed in the new control center. The NYISO is working on several initiatives to improve the ability to detect system vulnerabilities and disturbances, including oscillation monitoring (damping, mode shape) and voltage stability enhancements (MVAR management, voltage sensitivity loads, variable load factors). The NYISO, with the other reliability coordinators in the Eastern Interconnection, formed a new nonprofit entity in January 2014 known as the Eastern Interconnect Data Sharing Network, Inc. (“EIDSN”). The purpose of the EIDSN is to facilitate the secure, consistent, effective, and efficient sharing of important electric transmission and operational data among the reliability coordinators. The EIDSN is in the process of developing the technical architecture for a new scalable, deterministic, and redundant network that will allow for enhanced data sharing and operator situational awareness among neighboring reliability coordinators. The EIDSN began network development in 2014 and expects to complete the new network in 2015.



Recommendation 7.3) The NYISO should work with industry, DOE and regulators to examine how to provide a common approach for signaling, measurement, and verification of ancillary services for New York, New England and the nation.

The specifications for aggregators and the metering standardization were completed in 2013.

Recommendation 8.3) The increased utilization of natural gas is an example and should be considered in this context.

The NYISO coordinates with Market Participants on fuel supplies in advance of cold weather events, and it completed an assessment of the gas infrastructure's ability to serve generators in New York State. In December 2013, NYISO began using its "gas visualization" video board in the new control center to increase operators' awareness of the gas pipeline conditions. NYISO plans to enhance the video board by populating it with real-time data on pipeline system alerts and operational flow orders. The NYISO has highlighted the 800-MMcfd New Jersey pipeline expansion that came online on November 2013, which is alleviating the natural gas constraints into New York City.

The NYISO is leading efforts on the Interregional Eastern Interconnection Planning Collaborative (EIPC) Gas-Electric System Interface Study that is underway. EIPC selected Levitan & Associates to conduct a four-phase study, with each phase defined by a separate "target." Target 1 focused on establishing a baseline of existing natural gas and electric systems for the Eastern Interconnection footprint. Target 2 will explore infrastructure adequacy using natural gas and electric simulation models to look at a five- to ten-year horizon. Target 3 will conduct a contingency analysis. Target 4 will look at dual-fuel capability. The results for Target 1 study were finalized in April 2014. The draft for Target 2 study was delivered for comment in June 2014. The completed final report is scheduled for a May 2015 posting.

The NYISO is engaged in internal discussions to define the nature of the gas-electric coordination challenge and has begun conceptualizing possible market-based approaches to promote greater fuel assurance. As required by a November 2012 FERC Order, representatives from each RTO and ISO appeared in front of the Commission in October 2013 to share their continued progress in providing better coordination between the natural gas and electric industries and ensure adequate fuel supplies. The 2014 Business Plan included a goal to develop market concepts for fuel assurance. FERC held a Technical Conference on the impacts of the cold weather events on the RTOs/ISOs on April 1, 2014.

National trade organizations and their members continue to engage in discussions regarding gas-electric coordination with the RTOs and ISOs.

Recommendation 9.2) Make appropriate updates to emergency operations plans to address the experiences of recent severe events and possible future events.

NYISO’s Load Forecasting and Energy Efficiency group supports Operations during extreme weather events by providing frequent updates of expected load and weather conditions as they evolve; and, developing additional forecasting capability that gives Operations an alternative forecast representing extreme weather conditions on a regular basis.

Recommendation 9.4) Explicitly examine earth system models in determining the magnitude of future events (floods, temperature extremes, wind, etc.).

FERC issued Order 779 in May 2013 directing NERC to develop proposed Geomagnetic Disturbance (GMD) reliability standards. NERC filed proposed GMD standards with FERC in January. NYISO’s Load Forecasting and Energy Efficiency group regularly consults with its weather forecast services providers regarding the methods and accuracy of the several Numerical Weather Prediction (NWP) models they employ. They also review on a regular basis climatologically normal temperature and humidity conditions for weather stations located throughout New York.

Consumer Impact Analysis

A primary responsibility of the Consumer Interest Liaison is to evaluate the impact of major market design changes on consumers. Both scenarios—how a new market rule will impact reliability of the bulk power system, and how a new market rule will impact the competitiveness and efficiency of the market—are systematically analyzed using specific criteria.

Conducting consumer impact analysis is a formal process designed to include qualitative





and quantitative metrics for each of the areas analyzed. The analysis consists of assessing a new market rule by reviewing impacts under four evaluation areas: Reliability, Cost Impact/Market Efficiencies, Environment/ New Technology, and Transparency. Each study area is described below.

The impact on **Reliability** analyzes how a new project improves the reliability of the current system. Naturally, a project would not be implemented if it caused reliability issues or concerns.

The impact on **Cost Savings/Market Efficiency** analyzes the overall costs and benefits of implementing a project. It also reviews whether the project improves market operations and produces proper price signals to help spur investment.

The impact on **Market Transparency** assesses the extent to which the project will impact the transparency and clarity of market rules.

The impact on the **Environment** reviews how the project may affect the environment, focusing primarily on emission levels.

Projects selected for Consumer Impact Analysis is a subset of all NYISO projects selected during the annual Budget Project Prioritization Process. The Consumer Impact Analysis list is presented to the stakeholders annually for their input. This process occurs after the annual Budget Project Prioritization Process has been approved by stakeholders. The annual Budget Project Prioritization Process typically begins mid-year and ends late in the third quarter with the Board of Directors approving the annual budget. Prior to the Board's approval, NYISO staff and stakeholders discuss the proposed projects and budgetary costs for the year during the Budget and Priority Working group meetings. The projects that are included on the Consumer Impact Analysis Project list meet one or more of the following analysis guidelines:

- *Anticipated net production cost impact of \$5 million or more*
- *Expected consumer impact from changes in energy or capacity market prices is greater than \$50 million per year*
- *Incorporates new technology into New York Markets for the first time*
- *Allows or encourages a new type or category of market product*
- *Creates a mechanism for out-of-market payments for reliability.*

A preliminary list of approved projects to undergo an impact analysis is reviewed with stakeholders to receive feedback during a working group meeting. In 2013 the following projects were identified for a consumer impact analysis:

- *Scheduling & Pricing: Comprehensive Scarcity Pricing*
- *Fuel Assurance: Market Design Concepts*
- *Behind The Meter: Net Generation Model*
- *Possible Mechanisms to Determine the Need for Elimination of Capacity Zones*
- *SCR Performance Obligations: Change Minimum Performance Obligation from Four to Six Hours*
- *Criteria for Including Mothballed Units in the Forecast for Buyer-Side Mitigation Determination*

Consumer Impact Analyses for 2014

Consumer Impact Analysis: Comprehensive Shortage Pricing

Background/Overview

New York's narrowing power resource margins and the operational issues experienced during the 2013-2014 winter season, led the NYISO to launch a fuel assurance initiative that will look at ways to incent intra-day operational flexibility and promote increased resource availability and performance. Comprehensive Shortage Pricing is part of the NYISO's fuel assurance initiative. The NYISO proposed the following:

- *Model a SENY reserve region with a 1300 MW, 30 minute total reserve requirement based upon the worst first contingency on the UPNY-SENY interface*
- *Increase the NYCA 30 minute Reserve Requirement from 1965 MW to 2620 MW*
- *Revise Reserve and Regulation Shortage Pricing*

Benefits of Implementing Comprehensive Shortage Pricing

The NYISO's Comprehensive Shortage Pricing should improve the reflection of operator actions and system conditions in the Day-Ahead and Real-Time markets. The energy market will more efficiently capture these costs in energy market prices, thereby reducing uplift payments. The NYISO's proposal will also increase the incentives for resources to improve their plant availability. Improved plant availability



would correspondingly lead to reductions in Equivalent Forced Outage Rate on Demand (EFORD) and Installed Reserve Margin (IRM) requirements. Reductions in EFORD and IRM would reduce the costs of capacity to consumers. An additional benefit of the NYISO's Comprehensive Shortage Pricing proposal is to maintain pricing consistency with neighboring ISOs/RTOs.

It is imperative for New York to have a strong energy market price signal to ensure resources are available when we need them the most. Finally, the NYISO's proposal will shift some resource revenues from the capacity market to the energy market. Reducing the "missing money" covered by capacity payments will facilitate a more level playing field for resources that are more dependent on energy revenues to compete in the New York electricity market.

Consumer Impact Analysis

We assessed the potential impact on consumers of implementing the NYISO's Comprehensive Shortage Pricing proposal along four different evaluation areas: Cost Impact/Market Efficiencies; Reliability; Environmental/New Technology and Transparency.

Cost Impact/Market Efficiencies

The impact of the NYISO's Comprehensive Shortage Pricing proposal on market efficiency and cost to consumers was developed in three steps.

Step 1: Impact on locational based marginal pricing (LBMP) and the resulting increase in energy payments based on changes to shortage pricing

Step 2: Reduction in Capacity costs as a result of netting higher energy revenues from the net cost of new entry (Net CONE)

Step 3: The potential decrease in annual capacity costs as the IRM decreases with improved plant availability due to higher shortage prices

The combined impact of the first two steps is an expected decrease in cost to consumers. The increase in energy-related costs is less than the decrease in capacity costs since higher energy revenues are netted from the Net CONE during the Demand Curve reset. The potential for further decreases in annual capacity costs exists as the IRM decreases with improved plant availability due to higher shortage costs.

Step 1: Impact on Energy Revenues

To estimate the impact on energy payments, we first computed the expected change in LBMPs as a result of the shortage pricing proposal. We started by using Security Constrained Unit Commitment (SCUC) to rerun six days during which we experienced shortages in 2013, based on the new shortage pricing requirements. Next we computed a percentage change in LBMPs by looking at the difference in the original production results and the rerun SCUC results described above. The percentage change in LBMPs was applied to 2013 LBMPs based on the time of year, zone and hour.⁸ The percentage change in LBMPs was applied to Real Time LBMPs on the assumption that price convergence is expected between Day Ahead and Real Time prices.

The price impacts of the proposed shortage pricing were based on the methodology used in the 2013 State of the Market (SOM) report. As shown in Table 1, Column 3 the frequency of shortage intervals was increased to reflect the change in the NYCA 30 minute reserve requirement from 1965 MW to 2620 MW. The new SENY reserve region was not explicitly modeled, but instead the 30 minute total reserve requirement for the East was increased from 1200 MW to 1300 MW to approximate the impact of the SENY reserve region. Column 5 shows the estimated average shortage price based on the adjusted LBMPs discussed above. The last five columns show the change in average LBMPs in the different zones as a result of the proposed shortage pricing.

Ancillary Services Shortages	Current	Proposed	Curent	Proposed	Delta between 2013 Shortage Pricing Impact on LBMP and Estiamted Shortage Pricing Impact with Revised Shortage Prices				
	Current Shortage Frequency (# of Intervals)	Estimated Shortage Frequency (# of Intervals)	Current Average Shortage Price	Estimated Average Shortage Price	Change in Average LBMP: WEST	Change in Average LBMP: CAPITL	Change in Average LBMP: VL	Change in Average LBMP: NYC	Change in Average LBMP: LONGIL
10 Minute East	246	246	\$445.23	\$663.22		\$0.51	\$0.51	\$0.51	\$0.51
Regulation	1349	1349	\$165.09	\$206.80	\$0.54	\$0.54	\$0.54	\$0.54	\$0.54
Other NYCA Requirements	87	167	\$293.72	\$458.00	\$0.48	\$0.48	\$0.48	\$0.48	\$0.48
Total Amount Added to LBMP during Shortage Events					\$1.02	\$1.53	\$1.53	\$1.53	\$1.53
Potential Net Revenue (\$/kW - year):					\$8.93	\$13.40	\$13.40	\$13.40	\$13.40

Table 2 shows the potential increase in energy payments. Column 2 shows the energy payments by loads for 2013 based on actual LBMPs for that period. Column 3 shows the energy payments based on revised LBMPs resulting from changes to shortage pricing. The last column of Table 2 shows the difference in energy payments based on the actual and revised LBMPs for 2013. The revenue impact from shortage pricing may be potentially overstated as we did not model the amount of reserves that can be carried on Long Island, and we did not take into account changes in real-time unit commitment as a result of increases in the reserve requirements.

Table 2			
Zone	Total LBMP Cost for 2013	Total LBMP Cost for 2013 w/Revised Shortage	Delta
NYCA	\$2,872,519,094	\$2,948,948,191	\$76,429,097
GHI	\$1,037,013,966	\$1,066,319,907	\$29,305,941
NYC	\$2,998,925,049	\$3,080,493,915	\$81,568,866
NYC	\$1,667,659,447	\$1,701,491,888	\$33,832,441
			\$221,136,345

Step2: Decreases in Capacity Costs

Table 3 shows the potential reduction in capacity costs resulting from netting higher energy revenues from the Net CONE based on proposed shortage pricing. Data from May 2014 to October 2014 Monthly Capacity Auctions were used to compute the costs for the summer capability period. For the winter, we adjusted the ICAP/UCAP derating factor based on the winter/summer ratio. Table 3 shows that if 61% of additional revenues from shortage pricing shown in Table 2 were reflected in the calculation of Net CONE, the capacity cost reduction would equal the increase in energy revenues. We actually expect a higher percentage of energy revenues to be reflected in the Net CONE calculation, thereby resulting in an overall decrease in cost for consumers. At the December 2014 Business Issues Committee (BIC) meeting, the Market Monitoring Unit (MMU) said the following: “If you raise Real Time energy prices it will increase costs in the short term but as a general strategy, improving Real Time pricing is something that does reduce capacity payments more than it increases energy payments.”⁹ Columns 3-5 of Table 3 show the cost of capacity based on the 2014/2015 Demand Curve reference points for the four regions: NYCA,

G-J, J and K. Columns 7-9 show the cost of capacity for the same four regions based on the revised reference points. The last column of Table 3 shows the potential reduction in capacity costs.

Table 3									
Capacity Cost Impact (in Millions)									
Zone	Current Reference Price	Current Monthly Capacity Revenue Summer	Current Monthly Capacity Revenue Winter	Current Annual Capacity Cost	Revised Reference Price	Revised Monthly Capacity Revenue Summer	Revised Monthly Capacity Revenue Winter	Revised Annual Capacity Cost	Difference
NYCA	\$8.84	\$108.5	\$37.6	\$876.4	\$8.03	\$98.6	\$34.1	\$796.1	\$-80.3
G-J	\$12.14	\$49.1	\$26.0	\$450.5	\$11.30	\$45.7	\$24.2	\$419.3	-\$31.2
NYC	\$18.55	\$176.7	\$92.4	\$1,614.5	\$17.68	\$168.4	\$88.1	\$1,538.7	-\$75.7
LI	\$7.96	\$36.7	\$18.0	\$323.8	\$7.15	\$33.0	\$16.2	\$294.9	-\$33.4
				\$3,269.7				\$3,049.1	-\$220.6

Step 3: Additional Potential Cost Impacts

Enhanced shortage pricing should create incentives for generators to improve plant availability and therefore improve EFORd. This is based on the expectation that plant owners would take additional measures to ensure that their generators are available to avoid buying out their Day-Ahead positions in Real-Time at a higher cost as a result of the proposed shortage pricing. A review of NYISO studies indicates that a change in the NYCA EFORd leads to approximately an equivalent change in the Installed Reserve Margin (IRM). The 2013 and 2014 NYCA Installed Capacity Requirement Technical Study Reports show that an increase in the NYCA EFORd from 8.0% to 8.7% (over a five-year period) resulted in an IRM increase from 17.1% to 17.8%. We did not specifically estimate a decrease in IRM however; as discussed above, we expect an improvement in plant availability due to the incentives provided by the enhanced shortage pricing proposal. An increase in plant availability would improve EFORd which in turn would lower the IRM. A decrease in IRM would further reduce capacity costs for consumers. We have estimated that a 0.5% decrease in IRM would result in approximately \$200 million in reduced annual capacity costs. To reiterate, the combined impact of enhanced shortage pricing would result in reduced costs for consumers. We expect the decrease in capacity cost would exceed the increase in energy cost and an improvement in plant availability would further benefit consumers in lower costs.



Reliability Impact

The NYISO's proposal to establish a SENY reserve region with a 30 minute total reserve requirement of 1300 MWs will increase reliability as this new requirement will ensure that SENY power flows can be restored to the applicable limits following a contingency event. In addition, the NYCA 30 minute total reserve requirement will be increased from 1965 MW to 2620 MW. This will also have a positive reliability impact as it will ensure that NYCA can reestablish 10 minute operating reserves following the loss of the single largest supply contingency. Finally, the increase in shortage pricing will better align market pricing with the actual reliability needs during times when actions are taken to maintain reliability. This should create incentives for investment in areas that need it most, including investment that promotes fuel assurance.

Environment Impact

The higher 30 minute reserve requirement may lead to the use of slightly different generation resources; however, the impact on the environment is not expected to be significant.

Impact on Transparency

Reducing the “missing money” covered by capacity payments enhances transparency as more revenue is directly recovered in the energy market. It also facilitates a more level playing field for resources that are more dependent on energy revenues to compete in the New York electricity market.

Topics for Consumer Impact Analysis for 2015

The following projects were selected for Consumer Impact Analysis during 2015.

Scheduling & Pricing: Comprehensive Scarcity Pricing

The NYISO will develop and implement improvements to scarcity pricing and its application at external proxies. The NYISO will utilize the modeling of a scarcity reserve product in the pricing optimization during reliability Demand Response calls. This will move scarcity pricing into the real-time scheduling and pricing optimization process and better align scheduling decisions with pricing outcomes. The Consumer Interest Liaison will conduct a Consumer Impact Analysis as it is a significant market design concept.

Fuel Assurance: Market Design Concepts

The NYISO will explore market design changes that provide generators incentives to be available, especially when the risk of reduced real-time resource availability is high due to interchange and fuel supply uncertainty. This will include initiatives in the Energy and Capacity Markets. The intention is to provide incentives for intra-day operational flexibility, and to promote increased resource availability and performance. The Consumer Interest Liaison will conduct a Consumer Impact Analysis as it is a significant market design concept.

Behind The Meter: Net Generation Model

The NYISO will develop and implement design concepts that allow participation of generation whose primary purpose is to serve onsite load, to sell its excess generation in wholesale markets, including energy, capacity and ancillary services. This initiative will allow surplus energy, in excess of the generator's host load, to enter the NYISO wholesale markets and provide NYISO Operations additional energy and capacity resources. This initiative will be the subject of a Consumer Impact Analysis due to the fact that it allows or encourages a new type or category of market product.

Possible Mechanisms to Determine the Need for Elimination of Capacity Zones

Mentioned in the August 2013 New Capacity Zone order from FERC,¹⁰ the NYISO will work with stakeholders to consider whether a mechanism is needed to eliminate Capacity Zones. As a FERC directive where the NYISO has implementation flexibility, this qualifies as a topic for Consumer Impact Analysis.

SCR Performance Obligations: Change Minimum Performance Obligation from Four to Six Hours

The NYISO will develop rules to revise the performance obligation requirements of demand response resources that sell into the NYISO Capacity Market. This will result in improved reliability through clarification of performance requirements. The market rule changes have the potential to allow additional demand response resources to participate in the NYISO markets. As a significant market design concept, this qualifies as a topic for Consumer Impact Analysis.



Criteria for Including Mothballed Units in the Forecast for Buyer-Side Mitigation Determinations

FERC has asked the NYISO to consider, in consultation with its stakeholders, the need to modify the current Buyer-Side Mitigation (BSM) Rules with regard to mothballed generation units. The NYISO will evaluate and recommend the criteria for determining the set of resources to be included when forecasting capacity and energy revenues for the BSM process. This process improvement will present a more realistic view of the energy and capacity revenues for the BSM test procedure. This initiative is an emergent stakeholder issue and therefore subject to a Consumer Impact Analysis.

Major NYISO Efforts

Recent Developments in the Hudson Valley

Market developments in 2014 demonstrated that the new capacity zone in southeastern New York is playing a role in incenting needed private investment in power generation. Since the creation of the new Locality, the 495 MW Danskammer Generating Station in Newburgh, New York, and the 557 MW Bowline Generating Facility in Haverstraw, New York have made investments towards resuming service. The owners of both units have stated that the decision to invest in refurbishment and return the plants to service was in response to market signals resulting from the creation of the new capacity zone in the lower Hudson Valley.

While the new zone was controversial, the addition of new power resources is expected to improve reliability by bringing investment in resources to a region where increased supply was needed.

Other recent investment includes the 720MW CPV Valley Energy Center in Orange County, NY. CPV has accepted its Class Year project cost allocation, executed an Interconnection Agreement, and has announced it closed on financing for the project. These steps give a strong indication that CPV will add to the existing energy supply in the Lower Hudson Valley.

Incorporating Coordinated Transaction Scheduling (CTS) with ISO-NE

The Coordinated Transaction Scheduling (CTS) concept reduces the use of more expensive local power if less costly power is available from a neighboring system by encouraging the exchange of energy from low-cost to higher-cost regions, across a joint interface. The initiative to develop CTS with PJM was

approved by the governance structures of the NYISO and PJM in 2013 and was deployed in November of 2014. A new bidding platform, the Joint Energy Scheduling System (JESS), was introduced to facilitate the central management of regional transaction bids and schedules. In 2015 the NYISO will continue this coordination effort with its neighbors through the deployment of CTS with ISO New England. The initiative to implement CTS with ISO New England was approved by FERC in 2012, but due to incompatibilities between the two transaction scheduling systems it was delayed pending ISO New England system updates. The project has been scheduled for implementation in the fourth quarter of 2015.

Broader Regional Markets (BRM)

The NYISO's Broader Regional Markets initiative made significant progress in 2014. Through these extensive collaborative efforts, the NYISO seeks to mend differences, or "seams," in the fabric of neighboring, interconnected grids, thereby enhancing the efficiency of existing resources and reducing costs for consumers. In addition to the NYISO, the regional initiative involves PJM Interconnection, ISO New England, Midcontinent ISO, Ontario's Independent Electricity System Operator, and Hydro Québec.

Completed in 2013, the Ramapo Phase Angle Regulator (PAR) coordination between NYISO and PJM has demonstrated substantial production cost savings throughout 2014. CTS with PJM continues to optimize the flow of electricity across the PJM interfaces and reduce threats to reliability. The deployment of smart grid technologies also helps maintain system balance through the use of robust data, communications, and automated systems. All of these contribute to a shared understanding of regional natural gas delivery constraints for power generation. The CTS initiative will be extended to the ISO New England interface in the fourth quarter of 2015 to expand NYISO's ability to coordinate with a neighboring region to utilize the lowest cost resources available.

The NYISO is working with the Independent Electric System Operator (IESO) for Ontario, Canada in an effort to allow IESO resources to provide Installed Capacity to the NYISO. Previously, due to IESO market rules, Installed Capacity from IESO did not meet NYISO requirements for importing Installed Capacity. The NYISO is anticipating the facilitation of Installed Capacity imports from IESO by the fourth quarter 2015.



Energy Market Developments

The abundance of low price natural gas continued to dominate the energy market in 2014. The NYISO along with other northern grid operators were faced with severe system demands as the Polar Vortex extended from the Midwest through New England in the early months of 2014. While the sustained nature of the 2013-14 winter season created tremendous demands on the gas and electric infrastructure systems, reliability was met for millions of retail gas and electric customers.

On January 7, 2014, during one of five prolonged cold snaps, the NYISO set a new record Winter Peak Load of 25,738 MW, surpassing the prior record Winter Peak Load of 25,541 MW, set in 2004. Generation fuel diversity became a critical part of the generation mix as the availability of gas was reduced because of constrained pipelines and oil, because of delivery interruptions. To study the potential difficulties of severe winter weather, FERC held technical conferences to gain a deeper understanding and review lessons learned. The ISO/RTOs began to develop market rules to provide performance incentives to guarantee supplier performance in critical operating situations. The NYISO has responded to FERC and submitted concepts under the heading of Fuel Assurance Concepts.

Fuel Assurance

Under-performance by energy resources in extreme weather can result in several operational issues for the grid. Resources may not be available to bid into the Day Ahead Market, or units with a Day Ahead Schedule may not be available when the time arrives to meet their schedule in the real time. Extreme cold weather can contribute to operational factors, leading to:

- *Generator unavailability or derates as the result of fuel unavailability*
- *Equipment failures related to cold weather conditions*

To address these concerns the NYISO has adopted a strategy to comprehensively address fuel unavailability, cold weather equipment issues and other generator derates rather than focusing solely on fuel procurement. To address the identified areas of concern, NYISO will continue to propose further enhancements to its energy and capacity markets, along with enhanced generator reporting.

In 2014, NYISO worked with stakeholders to develop enhanced reserve shortage curves for the purpose of increasing the value of energy during tight operating conditions. This approach should provide financial incentives to generating units with binding day-ahead commitment schedules to improve performance during cold weather and other tight operating conditions.

The Comprehensive Shortage Pricing initiative will be implemented in the fourth quarter of 2015. In addition, the NYISO will introduce Comprehensive Scarcity Pricing to the market to complement the shortage pricing. Comprehensive Scarcity Pricing will incorporate scarcity pricing into the commitment software to properly value energy and reserves during Demand Response events.

The NYISO will pursue Capacity Market enhancements that would apply when operating conditions are tight for resources. The NYISO and stakeholders will implement performance incentives for energy suppliers to perform to assigned schedules on NYISO determined “critical operating days” through initiating a risk/reward system utilizing capacity payments.

The NYISO has undertaken several Control Room Operational improvements to provide additional transparency and enhanced reliability in times of operational stress conditions. These efforts consist of:

- *Fuel Surveys- Seasonal and cold-day surveys*
- *Gas-Electric Support- Additional position with gas industry experience to provide control room support*
- *NY State Agency Communication Protocol- To provide support for fuel and emissions permit issues*
- *Capability for updating actual fuel costs in Day Ahead reference development- Implemented in June 2014*
- *Operator Visualization- Posting gas related issues on the NYISO control room video wall*

By addressing the Fuel Assurance issue with this comprehensive approach, the NYISO will be in a position to maintain operational flexibility for potential critical operating environments.

Demand Response

Due to the recent court decisions concerning Demand Response in the wholesale markets, the NYISO has developed concepts for a backstop position for Demand Response. The NYISO recognizes the need to be prepared in order to minimize the market and reliability impact in the event that its demand response programs are no longer subject to FERC jurisdiction. It is important that the NYISO continues to reflect the value of demand side participation from both the reliability and market perspectives. The objective of the backstop model is to be prepared to implement any required changes to the market quickly and as seamlessly as possible. The NYISO is currently working with stakeholders to evaluate methods to accomplish the goals above while waiting for a final determination from the courts and the resulting guidance from FERC.



Distributed Energy Resources

Distributed Energy Resource technologies are “behind-the-meter” power generation and storage resources typically located on an end-use customer’s premises and operated for the purpose of supplying all or a portion of the customer’s electric load. Such a resource may also be capable of injecting power into the transmission and/or distribution system, or into a non-utility local network in parallel with the utility grid.¹¹

Increasing amounts of distributed energy resources (DERs) located on the customer side of the electric grid present both a challenge and an opportunity for grid operators. As the grid evolved around centralized generation, grid operators in conjunction with policymakers need to consider adjustments to the current framework for power supply dispatch and delivery to realize the potential benefits of increased DER penetration. The first step is to assess the implications of DERs. Policy and grid operator rules will have a strong influence over DER adoption and on its successful integration with the grid. Such rules need to account for the constraints of the grid, while others can be adapted for a more decentralized framework. Current approaches to integrating demand response and energy storage represent a starting point for integration of DERs, though additional adjustments are likely necessary. Discussion among industry stakeholders is critical to understanding the implications of changing our generation resource portfolio and transforming our approach to power delivery.¹²

In April 2014 the New York State Public Service Commission (PSC) released a report titled *Reforming the Energy Vision* (REV). The report announced a fundamental reconsideration of the regulatory paradigms and markets, examining how policy objectives are served both by clean energy programs and by the regulation of distribution utilities. The PSC effort is to “enable and facilitate new energy business models for utilities, energy service companies, and customers to be compensated for activities that contribute to grid efficiency. Maximize the cost effective utilization of all behind the meter resources that can reduce the need for new infrastructure through expanded demand management, energy efficiency, clean distributed generation, and storage.”¹³

The NYISO approach to developing the market concepts for DERs incorporates information from *A Review of Distributed Energy Resources*, a study commissioned by the NYISO and performed by DNV-GL, to evaluate trends that have the highest potential for near-term implementation. The adoption and penetration of DER is expected to be a gradual, long term trend. The evolution of technology, regulatory policy, and incentives will influence the rate and extent of DER adoption by end use customers and integration into the wholesale markets.¹⁴ The NYISO will continue to participate in the REV proceeding by providing comments as appropriate in that proceeding. As the REV proceeding develops, the NYISO will continue to align its concepts with the evolving REV process.

Endnotes

¹ The purpose of the Annual Report of the Consumer Interest Liaison is to provide a summary of the major initiatives undertaken by the NYISO's Consumer Interest Liaison over the past year.

² The NYISO Board is also permitted to pursue such change in advance of Management Committee approval, under exigent circumstances, and pursuant to Section 206 of the Federal Power Act in the absence of Management Committee approval. Proposed changes filed under Section 206 are reviewed by FERC under a more stringent standard. The NYISO Board has acted in this manner only on rare occasions.

³ *New York Independent System Operator, Inc.*, 122 FERC ¶ 61,064 (2008) (*January 29, 2008 Order*).

⁴ See: *FERC Order 719 (November 20, 2009) ER09-1142-000*.

⁵ See: *Constellation Energy Commodities Group, Inc.*, Docket No. IN12-7-000, *Final Report*, (May 22, 2013).

⁶ *Constellation Energy Commodities Group, Inc.*, Docket No. IN12-7-000 at [http://www3.dps.ny.gov/W/PSCWeb.nsf/a8333dcc1f8dfec0852579bf005600b1/1032df6ce36e122085257687006f39e5/\\$FILE/NYPSC%20Constellation%20Answer%202012-10-15.pdf](http://www3.dps.ny.gov/W/PSCWeb.nsf/a8333dcc1f8dfec0852579bf005600b1/1032df6ce36e122085257687006f39e5/$FILE/NYPSC%20Constellation%20Answer%202012-10-15.pdf).

⁷ The Final Report of the Consumer Advisory Council (CAC) and the NYISO's Management Response to the CAC's Final Report are posted on the NYISO's website under the Consumer Interest Liaison page.

⁸ The time of the year was defined as follows: Shoulder: March to May & September to November; Near Shoulder: February, June, August and December; Peak: January and July.

⁹ Pallas LeeVanSchaick from the MMU went on to explain: "And the reason for that is because you are actually targeting revenues more efficiently towards a smaller set of resources and these are the resources that provide us tangible benefits. If you're interested in lowering consumer costs over time, the best way to do that is to provide better incentives to the energy market."

¹⁰ *New York Independent System Operator, Inc.*, 144 FERC 61,126 Docket ER13-1380-00032 August 13, 2013 Order. http://www.nyiso.com/public/markets_operations/documents/tariffviewer/index.jsp.

¹¹ DNV-GL, NYISO DER Study – Project Update, April 2014, http://www.nyiso.com/public/webdocs/markets_operations/committees/bic_miwg/meeting_materials/2014-04-04/NYISO%20DER%20Study%20Stakeholder%20Update_031914%20v11_stakeholder.pdf.

¹² DNV-GL, A Review of Distributed Energy Resources, September 2014, http://www.nyiso.com/public/webdocs/markets_operations/committees/bic_miwg/meeting_materials/2014-04-04/NYISO%20DER%20Study%20Stakeholder%20Update_031914%20v11_stakeholder.pdf.

¹³ *NYS PSC Reforming the Energy Vision*” NYS DPS Staff Report and Proposal, CASE 14-M-0101, April 24, 2014.

¹⁴ Roger Kirkpatrick, NYISO MIWG Presentation, 11/19/2014 Market Concepts for Distributed Energy Resources, www.nyiso.com/public/webdocs/markets_operations/committees/bic_miwg/meeting_materials/2014-11-19/agenda%206%20Market%20Concepts%20for%20Distributed%20Energy%20Resources.pdf



For More Information

In addition to this report from the Consumer Interest Liaison and other documents referenced in this report, various governmental agencies and electric system organizations provide information useful to the electricity consumer, including:

- *Division of Consumer Protection, New York State Department of State*
<http://www.dos.ny.gov/consumerprotection>
- *New York State Public Service Commission (PSC)* *<http://www.dps.state.ny.us>*
- *New York State Energy Research and Development Authority (NYSERDA)* *<http://nyserda.org>*
- *Federal Energy Regulatory Commission (FERC)* *<http://www.ferc.gov>*
- *New York State Reliability Council (NYSRC)* *<http://www.nysrc.org>*
- *North American Electricity Reliability Corporation (NERC)* *<http://www.nerc.com>*
- *Northeast Power Coordinating Council (NPCC)* *<https://www.npcc.org>*

In addition, consumer-related information is available directly from the electric utilities serving New York State.

NYISO Publications

The NYISO issues a number of publications related to planning for the future electric grid and markets, critical and evolving energy issues, and new technologies. They are available on the NYISO website, www.nyiso.com.

Power Trends

The annual Power Trends report provides a review and analysis of the forces and factors influencing the future of New York's bulk electricity grid and its wholesale electricity markets.

The "Gold Book"

Published annually, the Load & Capacity Data Report (known as the "Gold Book") presents New York Control Area system, transmission and generation data and NYISO load forecasts. It includes forecasts of peak demand, energy requirements, energy efficiency, and demand response; existing and proposed resource capacity; and current and proposed transmission facilities.

Strategic Plan

The multi-year Strategic Plan outlines the NYISO's vision, mission, core values, and guiding principles, as well as NYISO goals and initiatives for the next five years.

Planning Reports

Reports published include the Reliability Needs Assessment, Comprehensive Reliability Plan, Congestion Assessment and Resource Integration Study, Wind Integration Study, and other documents vital to planning New York's energy future



New York Independent System Operator
10 Krey Boulevard
Rensselaer, NY 12144
www.nyiso.com