NEW YORK INDEPENDENT SYSTEM OPERATOR
10 Krey Boulevard ♦ Rensselaer, NY 12144

July 18, 2014

Via Electronic Email

Hon. Kathleen H. Burgess
Secretary
NYS Public Service Commission
Three Empire State Plaza
Albany, New York 12223

RE: CASE 14-M-0101 – *Proceeding on Motion of the Commission in Regard to Reforming the Energy Vision*

Dear Secretary Burgess:

Enclosed for filing with the Commission, please find the Comments of the New York Independent System Operator, Inc. ("NYISO") in response to the Ruling by Administrative law Judges Stein and Bielawski, issued June 4, 2014 in the above proceeding. [1] The NYISO respectfully asks the ALJs in this proceeding to consider its responses to the questions posed in the June 4 Ruling.

The NYISO is a not-for-profit corporation responsible for operating the state's bulk electric 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.

Thank you for your assistance in this matter. Should you have any questions regarding the transmittal of these comments, please contact Joy Zimberlin at (518) 356-6207 or jzimberlin@NYISO.com. Please address any other questions to myself at (518) 356-7346 or gdavidson@nyiso.com.

Sincerely,

/s/Gary Davidson
Gary Davidson, Team Leader
Strategic & Business Planning
New York Independent System Operator

[1] *Ruling Posing Questions on Selected Policy Issues and Potential Outcomes, Establishing Comment Process, and Revising Schedule*, Case 14-M-0101, Reforming the Energy Vision, issued June 4, 2014, ("June 4 Ruling").

STATE OF NEW YORK
Public Service Commission

Proceeding on Motion of the Commission in Regard to Reforming the Energy Vision	)))	Case 14-M-0101

Comments of the New York Independent System Operator, Inc.

Introduction and Executive Summary

In their June 4, 2014 Ruling Administrative Law Judges Stein and Bielawki ("ALJ") solicited comment on several major policy issues that will supplement the data gathered by each working group and be taken into account in the preparation of Staff's straw proposal. In its responses to the ALJ questions, below, the New York Independent System Operator, Inc. ("NYISO") discusses its agreement that the outcomes matrix provided as an attachment to the June 4 Ruling appropriately describes the goals of this proceeding. There are, however, three additional goals the Commission should consider. The NYISO believes that the outcomes or goals endorsed by the Commission must:

- Be pursued within the context of, and in support of, existing wholesale market structures;
- Support the maintenance or enhancement of reliability for all consumers; and
- Provide transparency in the operation of Distributed Energy Resources ("DERs") for Distributed System Platform Provider ("DSPP") system operations and planning.

Utilities are in a unique position to nurture the PSC's vision for a new electric system model in New York. Care should be taken to avoid a monopolistic structure where utilities act as market manager, distribution utility, DER provider, and DER developer in one. With proper rules at the outset, however, utilities can foster technological innovation through financing programs and development contracts with outside entities, as well as internal development of DER products and services. At the same time utilities will need to serve as the ultimate backstop, ensuring the reliability of their distribution systems.

Understanding the benefits and costs associated with greater deployment of DERs will rest largely on the extent to which those resources can be relied upon to meet energy needs beyond those of the host customer as well as an understanding of what resources are being deployed, where they are being deployed, how they are being operated, and what conventional energy resources they are displacing. Resources operating primarily to serve a host customer's energy needs, with no wholesale or retail market interaction, will inherently provide fewer benefits to the larger system. Conversely, resources that are integrated into wholesale or retail markets, capable of being dispatched to meet energy demand ("load") and displacing more expensive and less efficient conventional energy resources will create broader system benefits. Several factors will influence the level of benefits realized, and any policy determinations in this regard should recognize that benefits may be specific to the technology, location, and intended use of the resource.

Making a successful transition to a clean distributed energy future will require a continuation of the information sharing, and metering and verification programs that currently allow the NYISO, the utilities and state policy makers to forecast the implications of energy efficiency and customer-sited renewable investments on future load. Enhanced services offerings should not interfere with the utilities' primary focus of reliable and economically efficient service; nor should it result in the degradation of service for some in the interests of increased service for others (*e.g.*, increased reliability for some should not result in decreased reliability for others). Finally enhanced services should not set up competing demands for the same scarce utility resources.

Sections I through VI below contain the NYISO's responses to questions posed in the June 4 Ruling.

I. Potential REV Outcomes

> *"Please comment on whether the anticipated outcomes identified in the outcomes matrix are the appropriate results that the Commission should be striving for in this effort. Once the Commission has established the appropriate outcomes, parties will be asked to weigh in on the metrics to be used to most effectively achieve those results."*

NYISO Response

The categories of potential REV outcomes provided in the June 4 Ruling provide appropriate guidance as to goals around which the initiative should be structured. They also provide a useful starting point from which to consider measuring the success of the initiative. The Commission may wish, however, to prioritize the policy objectives that it wishes to achieve in the near term.

The NYISO has no comment on how these categories and objectives should be prioritized but does suggest three additional considerations that should be taken into account to ensure successful integration of the DSPP, and the DERs it will be facilitating, with the wholesale market.

The NYISO suggests that the outcomes identified by staff and endorsed by the Commission:

- Be pursued within the context of, and in support of, existing wholesale market structures, as these may be redesigned and revised pursuant to the NYISO stakeholder process and FERC acceptance;
- Support maintenance and enhancement of reliability for all customers; and
- Provide transparency in the operation of DERs for DSPP system operations and planning in order to operate and plan the bulk system appropriately and reliably. This would include sufficient transparency (location, size, type, availability "on peak," *etc.*) to promote accurate forecasting of DER activity.

Each of these essential aspects of maintaining a reliable electric system is discussed in greater detail below.

Existing Wholesale Market Structures

While specific wholesale market rules can be refined to accommodate the increased penetration and role of DERs in meeting load, there are fundamental market structures and concepts that have, over time, proven effective at reflecting system investment needs through appropriate price signals. The Commission should ensure that its new energy vision supports these existing structures and that it does not introduce incentives, products or methodologies that would work at cross purposes with the wholesale market model.

For instance, the energy market provides a mechanism for Market Participants to buy and sell wholesale energy at prices established through a competitive auction process. The process is designed to satisfy load with the least-cost resources available, but it also accommodates bilateral transactions where energy quantities and prices are arranged directly between wholesale suppliers and wholesale purchasers or load-serving entities ("LSEs") such as utilities. The price of energy or the "Location-Based Marginal Price" ("LBMP") is based on market and grid conditions at specific times and at specific geographic locations. Thus the wholesale price for energy reflects local demand and supply as well as constraints that may prevent less expensive energy from moving across the grid to meet demand.

To increase the efficiency with which the wholesale energy market commits supply resources for the next day, the NYISO incorporates sophisticated demand forecasting algorithms. An increased penetration of DERs will require the incorporation of their projected next-day activity to ensure the NYISO's wholesale supply commitment remains efficient and consumer costs are not unnecessarily inflated. In addition, the market rules surrounding the opportunity for supply resources to participate as wholesale suppliers in the Installed Capacity ("ICAP") market are crafted to ensure that New York State can depend on their availability to provide energy or load reduction when requested in order to maintain adequate generating capacity and reliable service. These assurances need to be continued even as a more diverse universe of resources come on line.

Since the value of capacity depends heavily on the location of that capacity, particularly because the transmission system faces congestion and constraints that limit the ability to deliver capacity from one region of the state where it may not be needed to another region where it is needed, the Commission should be cognizant of inefficiencies that may develop should significant additional supply-providing DERs locate in areas where transmission constraints may prevent them from serving load efficiently.[2]

Support Maintenance and Enhancement of Reliability

It is fundamental to the Commission's efforts in this proceeding that an increase in DERs not negatively impact bulk system and distribution-level reliability. To avoid negative impacts, DERs that provide additional energy or load reduction must be visible to or forecasted within existing

[2] Approximately 80% of new capacity installed since the inception of NYISO markets is located west of the transmission constraints that block capacity deliverability from upstate generators to downstate markets. Much of the new capacity added west of the transmission constraints since 2000 includes wind and other renewable resources installed to meet New York State's RPS goals for increased renewable energy supplies. The NYISO is cognizant of their reduced ability to locate in response to price signals due to renewable resource availability and land-use practices but, by the same token, their output may be constrained due to transmission constraints.

wholesale market processes in order to integrate DER activity with wholesale market activity. The precise form of integration will depend on how the DERs are expected to be used. DERs have the potential to introduce reliability challenges if they operate independently of the wholesale market and planning processes. A significant penetration of resources that respond to price signals but which are not schedulable could result in oscillating load and greater price volatility unless their operational parameters can be forecast and their activity incorporated into the wholesale market. Integrating DERs into unit commitment and real-time dispatch decisions either through adequate forecasts or actual scheduling will help operators to continue to dispatch resources in an economically efficient manner.

Transparency in System Operations and Planning

The NYISO's Reliability Planning Process establishes a 10-year planning horizon within which the NYISO seeks to identify any reliability needs resulting from possible transmission security or resource adequacy requirements. If the NYISO finds reliability needs at any point in the planning timeframe, the process seeks market-based solutions to address those needs as well as regulated backstop solutions should the market solutions fail to materialize. These solutions are "resource neutral" and can include investments in new generation capacity, new transmission capacity, or demand response resources that serve to preserve reliability by reducing demand. Crucial to identifying these long-term reliability needs is an understanding of what future load looks like.

NYISO has worked closely with NYSERDA, DPS, and stakeholders to integrate the state's energy efficiency goals and investment strategies into its planning process to provide greater certainty that all reliability needs identified in the planning process are truly reflective of system needs. Absent a concrete understanding of these efficiency goals and investments, it is possible the NYISO could identify "false positives" in assessing reliability needs by failing to account for the substantial load-suppression effects of such investments. The result of such failures in planning would be inefficient investments in areas of the grid where they may not be needed. Depending on the nature of such investments, the inability to factor the effects of efficiency investments into load forecasts could also lead to upward pressure on prices as ratepayers are asked to fund resources that ultimately may not have been needed, or may be oversized for the true need.

Similarly, if the NYISO is blind to the DSPP's processes for soliciting, selecting, or integrating DERs into the distribution system, the NYISO's planning processes may be based on false understanding of how load is growing or how it will be met. Such errors in assumptions could translate into inefficient investments potential risks to reliability, and increased costs to consumers.

To assist the DPS staff and the Commission in understanding how the NYISO considers DERs, Demand Response, and Energy Efficiency in its forecasts, an outline of the treatment of these resources in NYISO forecasts prepared by Arthur Maniaci, Supervisor, Load Forecasting and Energy Efficiency is attached (See Attachment I).

II. Optimal Ownership Structures for Distributed Energy Resources

"Please comment on the framework of analysis presented in the Staff Report, see pages 26-28, and discuss which of the potential approaches to utility engagement in DER and other models is preferable to ensure a robust DER market, and why."

**In this context, we are interested in party comments on the implications of the D.C. Circuit Court of Appeals decision on May 23, 2014 (Electric Power Supply Association v. FERC, Case No. 11-1486) concerning state jurisdiction with respect to demand response.*"*

NYISO Response

The NYISO recommends that utilities be actively engaged in the implementation of the REV design. As discussed in the Staff Report, utilities will need to be intimately involved in the design and functioning of new DER-related activities. The NYISO believes, however, that vesting the utility with the roles of market manager, distribution utility, DER provider, and DER developer at the same time may stifle the competition and technological advancement the PSC seeks to promote in this proceeding.

As the Staff Report acknowledges, "competitive processes are more likely to stimulate innovation in DER products for consumers."[3] Therefore the NYISO recommends maintaining an open development and interconnection process for all appropriate technologies and the entities that develop and market them. A utility has the responsibility to provide essential services to its customers where those essential services are not otherwise available. Entities in the business of developing consumer goods, however, are an unlikely provider of such services. The PSC should attempt to remove as many barriers to entry as possible, and encourage businesses to develop new DER technology for New York. Utilities can assist in this effort through contracting with such technology developers by establishing financing programs or through other methods.

While it is true that new technologies may raise reliability questions requiring direct utility engagement, utilities and technology developers should be encouraged to work cooperatively to ensure grid reliability and resiliency. The NYISO notes, however, that is likely that reliability questions arise because of the selection and implementation of particular technologies, and not necessarily due to the entities that develop those technologies. Thus, whether the utility or an independent entity develops a particular DER technology, similar reliability implications may likely exist. To the extent that these concerns do present themselves, cooperation and communication among the entities will help ease these complications.

Utilities are in a unique position to nurture the PSC's vision for a new electric system model in New York. Care should be taken to avoid a monopolistic structure where utilities act as market manager, distribution utility, DER provider, and DER developer in one. With proper rules at the outset, utilities can foster technological innovation through financing programs and development contracts with outside entities, as well as internal development of DER products and services. At the same time utilities will need to serve as the ultimate backstop for ensuring the reliability of their distribution system.

Judge Stein also asks how the D.C. Circuit Court of Appeals decision on May 23, 2014 may alter the current market rules surrounding use of customer-sited load reduction and energy production in the wholesale market, perhaps most particularly in the reliability programs

[3] White paper at 27

currently administered by the NYISO. The SCR capacity program has proven very important to assist the NYISO in managing bulk system reliability. The outcome of this decision is not yet known and any impacts it may have for these programs is uncertain. There are various approaches, however, that could be pursued should the inclusion of load reduction programs in a wholesale market need revision. Use of local load reduction could continue in distribution utility or DSPP-designed programs intending to compensate local customers or their aggregators for metered and verified reductions when the NYISO notifies the distributed utility or DSPP such reductions will be needed. Cost recovery mechanisms to reimburse the distributed utility or the DSPP for the cost of this compensation will have to be crafted.

III. DSPP Identity

"Please address the analysis contained in the Staff Report, see pages 24-26, as related to the question of whether incumbent utilities, or an independent entity, should serve as the DSPP."

NYISO Response

The Staff Paper envisions the DSPP being a central component of the REV vision. The DSPP will be charged with creating "markets tariffs, and operational systems" to allow behind-the-meter resources to provide new products and services and improve the efficiency of the distribution system. While suggesting that incumbent utilities may be best suited to be the DSPP, the Staff Paper leaves open the possibility for other, independent entities to serve in that role. The NYISO believes that both an independent entity and an incumbent utility could adequately satisfy the role of DSPP. However, to the extent that the PSC intends to create DSPPs in the near-term, incumbent utilities are better positioned to fill that role immediately. The NYISO urges the PSC, however, to ensure that the DSPP operates independently and apart from any other distribution-level functions the DSPP operator may have, such as ownership and operation of behind the meter resources. The independence of the DSPP is critical to ensuring open, transparent and fair access to the distribution system for DERs and the most efficient prices for consumers.

It has been the NYISO's experience as the Independent System Operator that competitive electric markets promote system reliability and attract grid investment when and where it is needed. New York's competitive markets also complement environmental quality improvements by encouraging efficient technologies that reduce fuel consumption and emissions and lower operating costs. Finally, the NYISO has found that open, competitive markets help with system planning by identifying solutions to New York's long-term needs. This avoids the non-transparent, and perhaps self-serving, identification of a solution to a reliability need by the entity identifying the need. A truly independent DSPP, functioning as a "mini-ISO" would be well positioned to bring these benefits to smaller-scale distribution-level networks. Working closely with incumbent utilities, DERs, new technology providers, and consumers, an independent DSPP would have the ability to look forward and anticipate the evolving reliability and technological needs of New York without being constrained by other business lines an incumbent utility may have.

The creation of an independent DSPP does have its drawbacks. As contemplated in the Staff Report, a new independent entity would not possess the same depth and breadth of knowledge as the incumbent utility with respect to a geographic territory. Further, while the independent DSPP could be created relatively quickly, it is unlikely that its staff could develop a sufficient understanding of the region's distribution system within the short timeframe preferred by the PSC. In order to get itself up to speed, an independent DSPP will have to work hand-in-hand with the incumbent utility, at least at the outset, increasing the resources necessary to establish the DSPP.

Thus, there is a benefit to installing the incumbent utility as the DSPP, even purely as a market manager. The utility already possesses the knowledge and understanding of its own footprint, allowing it to effectively manage its distribution network immediately. Indeed, further benefit is derived if the PSC intends the DSPP to provide other services as well. The incumbent utility has the infrastructure in place to support these other roles contemplated by the PSC, namely the identification, planning, design, construction, operation and maintenance of distribution facilities to allow widespread deployment of DER technologies.

The NYISO believes, however, that if an incumbent utility serves as the DSPP, it should be operated independently from the utility's other businesses. As discussed above, independence is necessary to ensure that there are open, fair and transparent markets for DER services in New York.

FERC's Standards of Conduct for Transmission Providers (Standards) act as a good model to effectuate independence on the distribution level. The Standards deter undue preference via two methods appropriate to the REV proceeding: (1) by requiring public utilities to separate employees engaged in transmission and marketing functions; and (2) by prohibiting the disclosure of non-public transmission system information to marketing employees.[4]

The so-called independent-functioning rule (described in (1) above) is a significant component of the Commission's attempt to prevent entities from advantaging their own company's marketing business through the provision of transmission service. Separating those employees who engage in operating the transmission system from those that engage in the submission of offers or bids of energy, capacity, demand response, or other electric products attempts to maintain equal footing between the transmission company's marketing arm and all other entities engaging in such transactions. In the context of the REV proceeding, it is important that non-utility DERs are given the same opportunity to participate in the provision of energy services as the utility, particularly when the utility may be establishing DER-type programs, such as distribution-level demand response. Maintaining such separation of functions also removes a barrier to entry for emerging technologies, provides access to new market participants, and may assist traditional market participants in expanding their businesses. The

[4] *Standards of Conduct for Transmission Providers*, Order No. 717, FERC Stats. & Regs. ¶ 31,280 (2008), *order on reh'g*, Order No. 717-A, FERC Stats. & Regs. ¶ 31,297, *order on reh'g*, Order No. 717-B, 129 FERC ¶ 61,123 (2009), *order on reh'g*, Order No. 717-C, 131 FERC ¶ 61,045 (2010), *order on reh'g*, Order No. 717-D, 135 FERC ¶ 61,017 (2011).

effect of such separation is to encourage businesses to develop creative solutions to New York's energy needs at the lowest possible cost to consumers.

The second component of the Standards (described in (2) above) is known as the "no-conduit" rule, and helps prevent marketing employees from obtaining beneficial, non-public transmission system information from internal sources. As applied in the REV context, prohibiting the sharing of such distribution system information will help ensure that competing businesses employ the same information upon which to base their transactions. For instance, if the DSPP's otherwise non-public distribution system operating information was available to a DER owner/operator affiliated with the DSPP, the affiliated entity could use that information to its advantage to ensure that it was utilized at the expense of non-affiliated DER owner/operators that do not have the benefit of that information. As with the independent functioning rule, the no-conduit rule helps maintain market transparency, reduces barriers to entry, and leads to efficient outcomes.

The NYISO sees value in both an independent entity acting as DSPP and in an incumbent utility acting in that capacity. While the NYISO views an independent entity to be the preferred "market manager" in the long term, it recognizes the value in continuity and expertise that the incumbent utility will provide as the DSPP. A compromise solution may be to have an independent arm of the incumbent utility act as the DSPP. If the incumbent utility is ultimately chosen, the NYISO strongly recommends that the PSC incorporate tailored versions of the independent-functioning and no-conduit rules into its creation of the DSPP. While it makes sense for incumbent utilities to serve in this new role, care must be taken to ensure that the market for DERs remains transparent, open, fair, and encourages technological innovation and provides consumers with efficient market outcomes.

IV. Benefits and Costs

> *"Discuss the preferred analytical framework to assessing benefits and costs, with particular attention to the different ways that benefits and costs may need to be considered in various stages of this initiative, and the methodologies and tools that may be appropriate to each. For example, what benefits and costs related to environmental externalities should be monetized in considering DER pricing?...."*

NYISO Response

The staff's matrix of potential outcomes represents the first step in monetizing the benefits of DERs that have not historically been monetized in markets. National standardized approaches for evaluating the grid benefits of DERs have not yet come into practice. Furthermore, even where a common practice may be used in a given locality, there are often disagreements about the assumptions used to estimate benefits. A review of PV cost-benefit studies by the Rocky Mountain Institute (RMI), for example, outlines some of the input assumptions used in such studies.[5] A sample follows:

[5] The Rocky Mountain Institute report, "A Review of Solar PV: Benefit and Cost Studies" summarizes factors taken into account across several PV cost-benefit studies, and illustrates how and why such studies differ.

- Fuel prices;
- Carbon prices;
- Power plant efficiencies, plant operations, and maintenance costs;
- Loss factors;
- Marginal resource characteristics (including heat rates, costs, etc.); and
- Transmission and distribution investment needs.

In addition, the scopes of evaluations often differ. In some cases, studies will include analysis of factors beyond grid benefits and costs, including factors like financial and security risk or environmental and social impacts, while other studies may consider a narrower scope of benefits.

Understanding the benefits and costs associated with greater deployment of DERs will rest largely on the extent to which those resources can be relied upon to meet energy needs beyond those of the host customer as well as an understanding of what resources are being deployed, where they are being deployed, how they are being operated, and what conventional energy resources they are displacing. Resources operating primarily to serve a host customer's energy needs, with no wholesale or retail market interaction, will inherently provide fewer benefits to the larger system. Conversely, resources that are integrated into wholesale or retail markets, capable of being dispatched to meet system load requirements and displacing more expensive and less efficient conventional energy resources, will create broader system benefits. While the NYISO takes no position on what specific environmental externalities should be monetized, the NYISO's Draft Report on Distributed Energy Resources[6] identifies several factors that influence the level of benefits to be realized. Policy determinations in this regard should recognize that benefits may be specific to the technology, location, and intended use of the resource.

DERs create opportunities for customers to self-provide energy, manage load profiles, improve power quality and resiliency, and help meet clean energy goals. At the same time, DERs can also potentially enhance the grid as a whole. Key motivating factors for the adoption of DERs for both customers and the grid are often described with the following categories:

- **Economic Benefits**: Include avoided costs, increased efficiencies, and gained revenues. For customers owning DERs, benefits can be tied to incentive payments as well as avoided costs associated with electricity bills. For utilities, regulators, and ratepayers, benefits can be tied to more efficient utilization of the grid and deferred investments.

[6] A Review of Distributed Energy Resources (DRAFT), New York Independent System Operator, (July 18, 2014). The NYISO will make this report available for the record in this proceeding as soon as it is released in final form. A draft of the report can currently be found at: http://www.nyiso.com/public/webdocs/markets_operations/committees/bic_prlwg_derw/meeting_materials/2014-07-18/DRAFT%20DER%20Report%202014%2007%2018.pdf .

- **Deferred or Avoided Network Investments:** Include avoided expansion of generation, transmission, or distribution facilities. This benefit, which can indirectly benefit all ratepayers, applies to the grid. Apart from providing economic benefits, DERs can also help avoid lengthy siting processes or can provide options where technical challenges exist around traditional capacity expansion. In some cases, the utilization of DERs can provide a quick or novel means for addressing grid challenges.
- **Resiliency and Power Quality:** The value of uninterrupted service in the event of loss of grid service and the ability to ride through transient and short-term interruptions. This can be applied to both customers who seek to reduce outage times or power quality events, and the utilities that are coordinating outage recovery efforts and managing grid power quality.
- **Clean Energy:** Includes the social, regulatory, and economic reasons to invest in low or no-emission DERs. Many customers are motivated to purchase clean DERs to support clean energy goals. Likewise, many utilities are doing the same, often motivated by goals or explicit targets. The net effect on emissions, however, has to be investigated per system because the displacement of centralized generation can have different effects on total emissions.

The interpretation of these motivating factors for a given customer or for a given portion of the grid depends greatly on the customer's needs and on the circumstances of the grid. Customer circumstances include:

- Individual preferences and needs, including preferences for renewable energy or need for increased reliability or higher power quality; and
  Economic circumstances, including the expected payback period, the ability to engage in financial transactions to acquire an asset, and the ability access government incentives.

Grid circumstances include the nature of the agreement(s) in place with grid operators or service providers regarding tariffs, interconnection policies, program incentives, or program participation. Benefit streams commonly attributed to DERs include:

- Energy and demand bill management (avoided costs);
- Power outage mitigation or critical power support during power outages;
- Power quality improvement;
- Direct compensation by grid operators or providers of services; and
- Financial incentives as defined by local, state or federal policymakers.

The performance of a DER can also depend significantly on:

- The physical location of a customer and asset;
- The customer's end use profile; and
- The presence of other behind-the-meter technologies or capabilities such as demand response or generation assets.

Often, the factors noted above are intertwined. For example, in addition to affecting DER performance, customer location can correspond to available tariff or incentive offerings and

local climate can influence end-use profiles. The grid benefits of DERs can also vary greatly by location and are dependent on the characteristics of the grid to which the units are interconnected. Common value streams identified for the grid through the managed use of DERs include:

- Reduced grid losses achieved by providing power closer to the customer and by reducing peak loads;
- Volt/var support achieved either indirectly or directly through the use of inverters and reactive power controls;[7]
- Deferred need for generation, transmission or distribution capacity by reducing peak load;
- Grid ancillary services, such as selling reserves and capacity services in wholesale markets;
- Avoided emissions;
- Improved grid resiliency by directly serving customers during outage or power quality events or potentially supporting restoration processes;
- Improved energy security from increased fuel diversity; and
- Avoided energy production or purchases.

The nature of these benefits, however, depends greatly on the mix of DERs on the grid and on the ability to coordinate DER activities in a way that aligns grid interests with individual customer interests. In some cases, the grid benefits naturally arise – such as with reduced peak consumption where DER output coincides with system peak. In other cases, incentives must exist for customers to take actions that benefit the grid, such as customers purposefully operating DERs when the grid could benefit. These incentives may take the form of direct subsidies or incentives (such as demand response program payments) or avoided costs (such as avoided demand charges). Furthermore, they may take the form of 'static' incentives, which do not vary over time (such as capacity payments) or 'dynamic' incentives, which do (such as dynamic energy prices). Information provided to customers about grid conditions and the agreement(s) in place with grid operators or service providers regarding tariffs, interconnection policies, program incentives or program participation can significantly influence the net effect of DERs on the grid. In turn, these policies can potentially prompt the adoption of DER technologies and their use for grid support by improving customer economics. Localized factors such as those listed below significantly influence the need for, and value of, the benefits noted above:

- Load profiles and peak load growth;
- Grid equipment age and type;
- Transmission and distribution capacities;
- Generation capacity and fleet make-up, including fuel use, operating costs, emissions control technology, and ramping capabilities; and
- Reliability standards or market rules (such as reserve requirements and penalties for sub-performance).

[7] For example, see Kleinberg et al 2013 and A. Zakariazadeh et al. 2014

For example, aggregate net load profiles and existing voltage management mechanisms influence the potential for grid loss reduction and the need for additional voltage support while peak load growth and the existing capacity of equipment affect the potential for capacity deferral.

V. Transition for Clean Energy Programs

"The Staff Report (see page 21) envisions the integration of distributed energy resources in DSPP system planning to maximize system value, with NYSERDA's portfolio expected to refocus on market and technology transformative strategies to provide temporary intervention to overcome specific market barriers while continuing to provide access to clean energy for low-income customers. How can we ensure the transition from current renewable and energy efficiency programs without backsliding on the state's environmental goals?"

NYISO Response

Continuing the current information sharing, and metering and verification programs, that allow the NYISO, the utilities and state policy makers to forecast the implications of energy efficiency and customer-sited renewable investments on future load would contribute significantly to a successful transition. The load forecasting group at the NYISO has worked with DPS staff and NYSERDA to appropriately model load reductions from these programs and to predict future reductions based on investment dollars/by program. Further information describing this task is included in Attachment I. When the DSPP is using energy efficiency "to produce maximum system value," the NYISO, utilities and state policy makers must be able to forecast expected reductions to a reasonable degree of accuracy. Information to support accurate forecasts of efficiency and customer-sited renewable investments on future load comes from program descriptions, customer implementation details and timeframes. Programmatic budget transparency is also key and must be maintained even as funding sources transition. In addition, measurement and verification for energy efficiency, customer-sited renewables and market transformation efforts will continue to be critical not only for the NYISO but also to guide policy makers and program administrators as they assess annual achievements and their progress on the state's environmental goals.

VI. Enhanced Services

"The Staff Report (see page 61) describes the potential for a regulated utility offering enhanced services to create revenues, some or all of which may accrue to revenue requirements. Please discuss the regulatory issues related to this potential, e.g. the definition of basic services and the relationship between enhanced services offered by a regulated utility and the monopoly function of the utility."

NYISO Response

The NYISO's markets are designed to provide consumers with reliable and economically efficient prices for their electric power. The NYISO feels strongly that New York's regulated utilities should also focus their efforts on providing their customers with reliable and economic

electric service. Enhanced services offerings should not interfere with the utilities' primary focus of reliable and economically efficient service; nor should it result in the degradation of service for some in the interests of increased service for others (*e.g.*, increased reliability for some should not result in decreased reliability for others). Finally enhanced services should not set up competing demands for the same scarce utility resources. Reliable, economically efficient service should remain the paramount service offered by each distributed utility.

July 18, 2014

Attachment I

Incorporation of Energy Efficiency, Demand Response, and Distributed Energy Resources in NYISO's Long Term Planning Processes

1. **Considerations for Incorporating Energy Efficiency ("EE"), Demand Response ("DR"), and other Distributed Energy Resources ("DERs") into NYISO Planning Studies**
    a. Demand response resources are placed "in front of the meter" and share many attributes of generators:
        i. Can be scheduled on and off by operators on short notice and have specific hourly impacts on loads;
        ii. Provide metered results of performance; tracked directly by NYISO;
        iii. Treated as a capacity resource in planning studies and receive energy payments, capacity payments or both;
        iv. Availability is treated probabilistically, in Installed Reserve Margin Study;
        v. Demand Response Resources may physically be generation behind the meter or load that is curtailed:
            1. NYISO Special Case Resources (approx 1200 MW), obligated to perform, receive both energy and capacity payments;
            2. NYISO Emergency Demand Response Program (approx 125 MW), not obligated to perform, receive only energy payments;
            3. NYISO Day-Ahead Demand Response Program – until recently, there has not been large participation. (Not currently modeled in planning studies.);
            4. TO-specific programs, which may or may not participate in NYISO programs:
                a. Con Edison AC duty cycling program;
                b. Con Edison Targeted Demand Response Program; (typically dispatched in evening hours for distribution system reasons);
                c. LIPA AC demand response program (typically dispatched during summer peak periods;
                d. Impacts are available to NYISO for determining impact on the hour of the NYCA peak load.
    b. Energy efficiency resources are placed "behind the meter" and share many attributes of load:
        i. Cannot be scheduled on and off by operators; reductions are treated as conformal to existing hourly load;
        ii. Do not typically have metered results of performance; tracked using DPS EE databases submitted by Program Administrators;
        iii. Treated as a deduction to loads in planning studies and provide reductions in electricity bills (including demand changes when appropriate);
        iv. Availability is treated deterministically (a single value of impact on energy or peak) in NYISO Gold Book Forecast of annual energy and seasonal peak demands.

2. **NYISO Planning Studies and Reports that currently incorporate EE, DERs, and DR Resources**
    a. Annual Load and Capacity Data Report (Gold Book) – Has deterministic impacts of EE and Solar PV on loads;
    b. Annual Installed Reserve Margin Study (IRM) – Probabilistic treatment of both loads and generation, one year ahead:
        i. Uses MARS model, which treats SCR and EDRP probabilistically, along with all other generation resources;
        ii. Loads (and EE by implication) are also treated probabilistically, via the Load Forecast Uncertainty distribution, above and below the base case point estimate:
            1. Each of seven load levels is treated for the moment as a point estimate of peak demand while the availability of generation resources (including DR) are modeled probabilistically thousands of times. The one-day-in-ten-years Loss of Load Expectation is a weighted sum of the LOLE values for each of the 7 load levels.
    c. Biennial Reliability Needs Assessment (RNA) – Like IRM, but looks ahead ten years to determine whether a reliability need exists, given future loads from Gold Book forecasts, firm TO Local Transmission Plans (LTPs), and changes in generation (e.g. units that have provided mothball or retirement notices, new units that meet inclusion rules). The RNA will define the needs in terms of Compensatory MW, which will provide insight as to the magnitude of the need and where it may be most efficient to locate a solution. This information is useful to developers in considering the location, size and type of facilities that can be implemented to address a need. It also provides insight to the rate of change in the need;
    d. Biennial Reliability Planning Study (RP) – The Reliability Planning Study follows the RNA and considers solutions to meet any reliability needs that may exist. In the existing tariff, proposed solutions must be detailed if they are needed in the first five years of the study period, but they can be conceptual for needs in the second five years. In the pending NYISO compliance filing this distinction is removed and NYISO is seeking more detailed solutions as a basis for selecting a solution. Solutions can be generation, transmission, DR, DERs, or EE;
    e. Biennial Congestion Assessment and Resource Integration Study (CARIS) – Uses the results of the CRP as a starting point to evaluate economic opportunities. The study utilizes a Multi-Area Production Cost simulation program (MAPS) to simulate the hourly production and congestion costs over the study horizon. The study also considers generic solutions (e.g., generation, transmission, EE, DERs, or DR) to assess whether there may be economic justification to develop resources in excess of reliability needs;
    f. Transmission Planning Studies (FERC 715 filing and others) – Base Case power flows and many other studies are based on Gold Book load forecasts.

3. Prospective Treatment of New EE, DR and DERs

a. Fundamental principles for new Demand Response, Distributed Energy Resources and Energy Efficiency (especially in light of potential impact on DR of FERC 745 ruling <if sustained>)
   i. New DR, DERs and EE may be treated like generation resources or as load reductions, based on resources attributes;
   ii. Impacts of DR, DERs and EE on hourly loads will need to be considered;
   iii. Transparency of EE, DERs and DR at distribution level should still be transparent to the ISO / grid operator:
      1. DR could be requested of a distribution system operator by the NYISO if needed:
      2. DR can provide NYISO with sufficient information to reconstruct loads for planning purposes.
   iv. Interconnection issues related to integration of new DER resources will need additional study, review and attention at all levels of the power system. Interconnection procedures, processes and standards may need to adapt in response to greater integration of DERs at all levels of the existing power system.

b. Customer-Sited Solar PV
   i. Can be modeled in real-time and accounted for in real-time load forecasts;
   ii. Impact is growing rapidly and expected to continue to ramp up for the next few years at least:
      1. NYISO has already begun to include impact along with EE in the 2014 Gold Book, and by implication in all current planning studies.
   iii. Essential to have accurate and detailed historic and prospective information from NYSERDA and its contractors on size and location of resources:
      1. NYISO is currently in discussion with NYSERDA staff to obtain greater depth and breadth of information.

c. Energy Efficiency
   i. Current methods and approaches expected to be sufficient for future planning needs;
   ii. Advance information on new direction for EEPS after 2015 would be very helpful: especially increase or decrease in budget and scope.

d. Distributed Energy Resources
   i. Micro-grids – Could be either a load modifier (an otherwise invisible impact not known to the NYISO) or a capacity resource, at discretion of TO:
      1. High level of uncertainty for how to treat in future.
   ii. Auto-DR – High tech version of 'Prices to Devices':
      1. High potential for new price-responsive DR;
      2. Need to consult with Con Edison to find out the results of their pilot Auto-DR program (joint study with NYSERDA).

e. System Impact Issues
    i. As DERs, Solar PV and EE gain penetration into the power system (either the local or bulk level), the intermittent impact of the resources (due to weather, technology, behavioral or other factors) can result in issues with grid operations and reliability;
    ii. Some of these issues may require new interconnection standards, procedures, and processes to maintain acceptable power system performance and reliability. System impact issues may also need to be addressed by other approaches than through interconnections;
    iii. Standardized interconnection requirements should also focus on issues that may not arise until sizable penetrations have been achieved.