

August 12, 2015

By Electronic Delivery

Hon. Kathleen H. Burgess  
Secretary  
New York State Public Service Commission  
Three Empire State Plaza  
Albany, New York 12223-1350

**Re: Case 15-E-0302 – In the Matter of the Implementation of a Large-Scale  
Renewable Program**

Dear Secretary Burgess:

In accordance with the Notice Instituting Proceeding, Soliciting Comments and Providing for Technical Conference and the Notice Extending Deadline for Comments issued by the New York State Public Service Commission on June 1, 2015 and July 15, 2015, respectively, in the above-referenced matter, the New York Independent System Operator, Inc. hereby submits the enclosed Comments.

Respectfully submitted,

/s/ Garrett E. Bissell

Garrett E. Bissell

Senior Attorney

New York Independent System Operator, Inc.

**STATE OF NEW YORK  
PUBLIC SERVICE COMMISSION**

---

**In the Matter of the Implementation of a  
Large-Scale Renewable Program**

---

**Case 15-E-0302**

**COMMENTS OF THE NEW YORK INDEPENDENT SYSTEM OPERATOR, INC.**

Pursuant to the Notice Instituting Proceeding, Soliciting Comments and Providing for Technical Conference and the Notice Extending Deadline for Comments issued by the New York State Public Service Commission (“Commission”) on June 1, 2015 and July 15, 2015, respectively, in the above-captioned matter, the New York Independent System Operator, Inc. (“NYISO”) hereby submits its Comments in response to the questions posed by the Commission. The NYISO supports the Commission’s objectives to increase fuel diversity and reduce emissions through the development of renewable generation facilities in New York. The wholesale markets administered by the NYISO have been designed in a manner to support the State’s policy of increasing renewable generation and, to date, the State’s programs for fostering such development have maintained compatibility with the NYISO-administered markets. The NYISO urges the Commission to ensure that the rules developed for future procurements of large-scale renewable generation facilities (“LSRs”) remain consistent with New York’s competitive wholesale markets.

**I. BACKGROUND AND PRELIMINARY STATEMENT**

On August 22, 2014, the Staff of the New York State Department of Public Service (“DPS Staff”) issued a straw proposal in the Commission’s Reforming the Energy Vision

proceeding.<sup>1</sup> The Straw Proposal, among other matters, recommended changes to the current Renewable Portfolio Standard (“RPS”) program, including replacement of the current renewable energy credit (“REC”)-only contracts provided to competitively selected renewable generation facilities with bundled power purchase agreements (“PPAs”) for energy and RECs.<sup>2</sup> In response to the Straw Proposal’s recommendations regarding future procurements of LSRs, the Commission directed the New York State Energy Research and Development Authority (“NYSERDA”) and DPS Staff to prepare a study identifying potential options for consideration in designing a new LSR program.<sup>3</sup>

On June 1, 2015, DPS Staff and NYSERDA issued a report analyzing various options for future LSR procurements in New York.<sup>4</sup> The LSR Options Paper outlines various potential procurement methodologies for LSRs, including: (i) maintaining the status quo of the RPS by providing NYSERDA issued REC-only contracts to LSRs selected through NYSERDA-administered procurements;<sup>5</sup> (ii) providing NYSERDA issued contracts-for-differences (“CFDs”) to LSRs selected through NYSERDA-administered procurements;<sup>6</sup> and (iii) providing long-term, bundled PPAs for energy and RECs to LSRs issued by either a State entity or the

---

<sup>1</sup> Case 14-M-0101, *Proceeding on Motion of the Commission in Regard to Reforming the Energy Vision*, Developing the REV Market in New York: DPS Staff Straw Proposal on Track One Issues (August 22, 2014) (hereinafter referred to as the “Straw Proposal”).

<sup>2</sup> *Id.* at 52.

<sup>3</sup> Case 14-M-0101, *supra*, Order Adopting Regulatory Policy Framework and Implementation Plan (issued February 26, 2015) at 83.

<sup>4</sup> Case 15-E-0320, *In the Matter of the Implementation of a Large-Scale Renewable Program*, Large-Scale Renewable Energy Development in New York: Options and Assessment – Final Report (June 1, 2015) (hereinafter referred to as the “LSR Options Paper”).

<sup>5</sup> *Id.* at 65-67.

<sup>6</sup> *Id.* at 68. The CFDs assessed in the LSR Options Paper are intended to serve as the financial equivalent of a long-term, bundled PPA by providing a LSR a fixed level of revenue earning for each megawatt-hour (“MWh”) of energy produced.

Commission-regulated investor owned utilities, with the option to pursue utility-owned generation arrangements as an alternative to a PPA.<sup>7</sup>

The competitive wholesale markets have provided and continue to provide significant benefits to the State and its electricity consumers, including fuel cost savings, improved generation efficiency, reduced reserve requirements, reduced emissions and the integration of new renewable generation facilities. To ensure the continued delivery of these benefits, it is critically important that State policies to spur the further development of renewable generation in New York maintain consistency with, and do not undermine the operation and benefits of, the competitive wholesale markets.

Different procurement options for LSRs have varying degrees of compatibility with the NYISO-administered markets. The current structure of providing REC-only contracts to competitively selected LSRs through the RPS program has a proven track record of success and compatibility with the competitive wholesale markets. Other procurement options, such as long-term, bundled PPAs, CFDs that operate as the financial equivalent of a long-term, bundled PPA (“financially-equivalent CFDs”), and utility-owned generation arrangements, however, raise substantial concerns regarding compatibility with the competitive wholesale markets. These concerns arise from the fact that such arrangements effectively insulate LSRs from wholesale market pricing signals. This insulation has the potential to adversely impact both the functioning of the wholesale markets and reliability of the State’s electric system. It is imperative that the Commission ensure that the rules and incentive structure established for the future LSR program, like the current RPS program design, maintain consistency with the competitive wholesale markets.

---

<sup>7</sup> *Id.* at 68-71.

## II. COMMENTS

### A. The Competitive Wholesale Markets Facilitate the Integration of Renewable Generation

The competitive wholesale markets have delivered substantial benefits to the State and electricity consumers. Fuel efficiency of generation facilities has improved more than 27 percent – 300 percent better than the national average – as a result of competition, providing an estimated fuel cost savings of \$6.4 billion between 2000 and 2013.<sup>8</sup> Performance and operational improvements of generation facilities since the introduction of competition has also resulted in reduced reserve margin requirements, producing an additional savings of \$540 million since 2000.<sup>9</sup> The benefits of the NYISO-administered markets have further contributed greatly to a reduction in carbon emissions by more than 40 percent from 2000 to 2013 – a reduction equivalent to the annual emissions of 4.8 million passenger vehicles.<sup>10</sup> The competitive markets have achieved these significant benefits while shifting the risk of generation investments from consumers to independently-owned generating companies.

The NYISO wholesale energy market is, by design, fuel agnostic. The competitive wholesale energy market meets the State’s electrical load requirements while maintaining the reliability of the bulk electric system at the lowest overall production cost based on the offers submitted by supply resources. A fundamental component of the design is the uniform clearing price mechanism, which pays all selected supply resources based on the cost of energy produced by the marginal supply resource that can serve the next increment of load. Because renewable generation typically has very low marginal costs, renewable resources are scheduled to produce

---

<sup>8</sup> NYISO, *Powering New York – Responsibly*, available at: [http://www.nyiso.com/public/webdocs/media\\_room/publications\\_presentations/Other\\_Reports/Other\\_Reports/NYISO\\_15\\_Year\\_Brochure.pdf](http://www.nyiso.com/public/webdocs/media_room/publications_presentations/Other_Reports/Other_Reports/NYISO_15_Year_Brochure.pdf).

<sup>9</sup> *Id.*

<sup>10</sup> *Id.*

energy to meet system needs ahead of more expensive supply resources, such as fossil-fuel fired generation. The uniform clearing price mechanism establishes compensation for renewable facilities that is generally based on the cost of these more expensive supply resources, providing renewable facilities additional revenue earning opportunities. This fundamental design element serves to incent investment in resources, such as renewable facilities, that have low marginal costs.

The NYISO has further contributed to New York's leadership in the development of renewable generation through advancements in market design and the deployment of sophisticated forecasting systems. In 2008, the NYISO developed procedures and software to collect forecasts and real-time meteorological data from wind generation sites to facilitate more accurate predictions of generation output from each facility.<sup>11</sup> Wind power forecasts developed from this data are fed directly into the NYISO's scheduling and dispatch systems for determining the lowest cost means of serving the electricity requirements of the State, while simultaneously maintaining the reliability of the electric system. The development of accurate output forecasts facilitates more efficient unit commitment decisions and transaction scheduling with neighboring systems in real-time.

In 2009, the NYISO became the first grid operator to fully integrate wind generation resources into its economic dispatch system.<sup>12</sup> This integration enables wind resources to indicate their economic willingness to generate, thereby allowing for the identification and use of

---

<sup>11</sup> NYISO, *Integration of Wind into System Dispatch* (October 2008) at 2-4, available at: [http://www.nyiso.com/public/webdocs/media\\_room/publications\\_presentations/White\\_Papers/White\\_Papers/wind\\_management\\_whitepaper\\_11202008.pdf](http://www.nyiso.com/public/webdocs/media_room/publications_presentations/White_Papers/White_Papers/wind_management_whitepaper_11202008.pdf).

<sup>12</sup> See FERC Docket No. ER09-802-000, *New York Independent System Operator, Inc.*, Proposed Tariff Revisions to Enhance Operational Control of Wind Resources, Amend Settlement Rules Applicable to Them and Increase System Reliability (March 5, 2009); and FERC Docket No. ER09-802-000, *supra*, Order Accepting Tariff Revisions (issued May 11, 2009).

the most efficient resources to address reliability limitations. Economic re-dispatch of renewable generation, when necessary to address reliability constraints, facilitates precision in addressing system constraints and avoids the need to rely on manual actions by system operators to reduce output from wind resources. Manual scheduling adjustments are generally less efficient because they tend to be made less frequently than the 5-minute dispatch performed by the NYISO's real-time system. This tends to result in larger and longer reductions in wind generator output than is necessary and underutilization of transmission system capability.

The NYISO's competitive wholesale market design, together with the State's current policies for spurring the development of renewable generation, has a proven track record of success. Since implementation of the RPS program in 2004, the capacity of wind generation installed in New York has increased by more than 3,500 percent.<sup>13</sup> The amount of electricity generated from New York's wind resource fleet in 2014 – 3,986 gigawatt-hours<sup>14</sup> – is equivalent to enough electricity to power more than 500,000 New York homes.

The NYISO is actively pursuing initiatives to further enhance its market design and improve pricing efficiency, including: (i) the Comprehensive Shortage Pricing project;<sup>15</sup> (ii) the implementation of a graduated transmission demand curve;<sup>16</sup> and (iii) improvements to the

---

<sup>13</sup> NYISO, *2015 Load & Capacity Data* at 62, available at: [http://www.nyiso.com/public/webdocs/markets\\_operations/services/planning/Documents\\_and\\_Resources/Planning\\_Data\\_and\\_Reference\\_Docs/Data\\_and\\_Reference\\_Docs/2015%20Load%20and%20Capacity%20Data%20Report.pdf](http://www.nyiso.com/public/webdocs/markets_operations/services/planning/Documents_and_Resources/Planning_Data_and_Reference_Docs/Data_and_Reference_Docs/2015%20Load%20and%20Capacity%20Data%20Report.pdf).

<sup>14</sup> *Id.* at 63.

<sup>15</sup> See FERC Docket No. ER15-1061-000, *New York Independent System Operator, Inc.*, Proposed Tariff Revisions to Ancillary Service Demand Curves and the Transmission Shortage Cost (February 18, 2015); and FERC Docket No. ER15-1061-000, *supra*, Order Conditionally Accepting Proposed Tariff Revisions (issued April 20, 2015).

<sup>16</sup> See FERC Docket No. ER15-485-000, *New York Independent System Operator, Inc.*, Proposed Tariff Amendments to Revise Transmission Shortage Costs (November 25, 2014); and FERC Docket No. ER15-485-000, *supra*, Letter Order (issued January 15, 2015).

current pricing rules applicable during demand response activations (*i.e.*, the Comprehensive Scarcity Pricing project). The benefits expected from these initiatives include:

- targeted energy market price signals that align with actual reliability needs at times when actions are being taken to maintain reliability;
- improved generator performance and fuel assurance during critical operating periods;
- reducing the amount of revenue necessary for recovery through the capacity market;
- incentives for investment in the areas of greatest need; and
- promoting additional response from demand response and distributed energy providers when needed.

By seeking to shift additional revenues out of the capacity market and into the energy market, these initiatives facilitate the creation of a more level playing field for resources, such as renewable generators, that are more dependent on revenue from the energy market.

Imperative to the continued success of the competitive wholesale markets, including the integration and incenting of renewable generation, is the consistency of State policies with such markets.

**B. The Commission Must Ensure that the LSR Program Maintains Consistency with the Competitive Wholesale Markets**

Efficient competitive wholesale markets depend on transparent prices that accurately reflect system needs and the cost of supply resources to meet such needs. As noted in the attached supporting affidavit of Dr. Robert A. Sinclair of Potomac Economics, the NYISO's Market Monitoring Unit, "[e]fficient LBMPs are central to the effective functioning of the NYISO markets."<sup>17</sup> These transparent and accurate price signals provide the foundation for

---

<sup>17</sup> *Affidavit of Robert A. Sinclair, Ph.D.* at ¶ 16 (hereinafter referred to as the "Sinclair Affidavit"). Capitalized terms not otherwise defined herein shall have the meaning specified in Section 1 of the NYISO Open Access Transmission Tariff and Section 2 of the NYISO Market Administration and Control Area Services Tariff.



economically efficient generation, transmission, demand response and energy efficiency investment decisions. Supply resources rely on prices to determine whether to operate. Investors and developers rely on prices to determine whether to build new facilities, what type of facility to build and where to build. Consumers also rely on prices to decide how much electricity to buy and help inform investment and operating decisions. Prices that fail to accurately reflect system needs and resource costs will result in incorrect signals, leading to inefficient decisions and ultimately higher costs for consumers.

Competitive markets also shift investment and performance risk from consumers to the entities that are best positioned to manage such risk – investors and facility owners. In competitive markets, investors and facility owners evaluate alternatives, make investment decisions and place their capital at risk. Market prices provide the incentives to build new infrastructure with consumers being freed from the obligation to fund such investments. Poor investment decisions, even if reasonable at the time they were initially made, result in the accrual of losses for investors and facility owners rather than consumers. This risk allocation spurs the continued pursuit of innovation and investments to improve operational efficiency and availability and reduce production costs of supply resources.

The NYISO has actively served as a constructive partner in the State's efforts to spur the development of additional renewable generation and continues to support such efforts. The NYISO, however, has continually advocated for the need to avoid the use of renewable incentive mechanisms that would undermine the efficiency of the competitive wholesale markets.<sup>18</sup> The

---

<sup>18</sup> See, e.g., Case 03-E-0188, *Proceeding on Motion of the Commission Regarding a Retail Renewable Portfolio Standard*, Initial Comments of the New York Independent System Operator, Inc. (September 26, 2003) at 15-17; Case 03-E-0188, *supra*, Comments of the New York Independent System Operator, Inc. on Phase I Report: The Effects of Integrating Wind Power on Transmission System Planning, Reliability and Operations (March 19, 2004) at 6-7; Case 03-E-0188, *supra*, Comments of the New York Independent System Operator, Inc. on Proposed Rulemaking (December 22, 2004) at 2-4; and

cooperative efforts of the NYISO and the State, to date, have allowed renewable generation to flourish, while ensuring that the competitive wholesale markets continue to deliver their intended benefits and provide a platform for transitioning to a purely market-based system for developing renewable generation in New York.

The various potential procurement options assessed in the LSR Options Paper have vastly different levels of compatibility with the competitive wholesale markets. Options such as long-term, bundled PPAs, financially-equivalent CFDs and utility-owned generation arrangements may have adverse impacts on the NYISO-administered markets. These incentive constructs are far less consistent with the NYISO-administered markets than the current REC-only contracts provided pursuant to the RPS program.

Potomac Economics concurs, concluding that retention of the current REC-only incentive mechanism is superior to the other options in terms of consistency with, and not undermining the efficiency of, the NYISO-administered markets.<sup>19</sup> This conclusion is consistent with the prior findings of Potomac Economics as part of an assessment conducted during the initial implementation of the RPS program that analyzed similar incentive payment options being considered at that time.<sup>20</sup>

Incentive constructs, such as long-term, bundled PPAs, financially-equivalent CFDs and utility-owned generation arrangements also alter the risk allocation design that is fundamental to competitive markets. These incentive mechanisms allocate investment and performance risk primarily to consumers rather than investors and facility owners. As noted by Dr. Sinclair, “the

---

Case 03-E-0188, *supra*, Comments of the New York Independent System Operator, Inc. (March 15, 2010) at 2-3.

<sup>19</sup> Sinclair Affidavit at ¶ 15.

<sup>20</sup> Potomac Economics, Ltd., *Estimated Market Effects of the New York Renewable Portfolio Standard* (June 2005) at 7-10 and 43-46, available at: <http://www.ksg.harvard.edu/hepg/Papers/Potomac.RPS.Market.Impact.Study.6.6.2005.pdf>.

inherent price risk is not reduced, it is just shifted to customers. In fact, by shifting risk to customers (who cannot control it), risk may actually increase.”<sup>21</sup> Allocating risk away from the entities that can best manage and mitigate it undermines many of the benefits derived from competitive markets.

Shifting investment and price risk away from investors and facility owners reduces the otherwise applicable incentive for facilities to maximize operation (and, thus revenue earnings) during high price periods. This may result in the over-supply during other periods causing very low or even negative market prices.<sup>22</sup> Consumers, however, would remain liable for funding the full value of the agreed to contract price regardless of market outcomes. This may cause the need to fund larger above-market payments to LSRs than would otherwise be necessary if such resources were appropriately incentivized to be price responsive.

Long-term bundled PPAs, financially-equivalent CFDs and utility-owned generation arrangements may result in adverse market and reliability impacts because such mechanisms effectively insulate LSRs from temporal and location-based wholesale market price signals. These arrangements essentially guarantee that LSRs receive a certain level of revenue for each MWh of output. This market insulation distorts the incentive for LSRs to respond to dispatch instructions and properly locate their facilities in areas of highest value.

Because the fixed revenue guaranty is tied to production, these mechanisms would provide the perverse incentive for LSRs to generate regardless of market prices and system conditions in order to maximize their revenue earnings. In an effort to ensure that their unit gets

---

<sup>21</sup> Sinclair Affidavit at ¶ 22.

<sup>22</sup> Negative pricing is indicative of significant supply-demand mismatches and transmission capacity limitations to deliver output from the point of generation to load centers. The price signal provided by negative prices incentivizes supply resources to reduce output in order to avoid paying the system to accept its production. Despite price signals incenting reduction in supply, excess supply can reach levels requiring re-dispatch or curtailment of output in order to maintain system reliability.

scheduled, LSRs would be incented to submit negative offer values to ensure their dispatch regardless of market prices or system conditions. This bidding behavior could exacerbate the potential for very low and even negative energy prices. This concern is especially acute given the clustering of wind resources in relatively discrete geographic locations in the northern and western portions of the State where wind conditions are best for generation.

The price suppressive effects of LSRs that are insulated from market prices would also likely place additional financial strain on other supply resources (including other renewable facilities) that do not benefit from such arrangements. The LSRs, however, remain unaffected because the level of revenue received is fixed regardless of market outcomes.

Use of long-term, bundled PPAs, financially-equivalent CFDs and utility-owned generation arrangements also reduce the incentive for LSRs to invest in locations of highest value. Absent the market insulation provided by these instruments, LSRs, like other supply resources, would seek to maximize their revenue earnings opportunities by selecting locations on the grid where they are needed most, as reflected by relatively higher prices. As explained by Dr. Sinclair:

[r]esources that are compensated in the energy market at LBMPs will efficiently balance development costs, local operating benefits (like wind velocity), and the locational benefit to the grid (as reflected in energy prices). Resources that are insulated from LBMPs will balance only the development costs and operating benefits. This will cause developers to make inefficient locational choices.<sup>23</sup>

LSRs receiving market insulating incentive mechanisms, however, would prefer developing their facilities in locations where the installed cost is lowest without regard to whether such location would be beneficial to the system and consumers. This would likely

---

<sup>23</sup> Sinclair Affidavit at ¶ 20.

continue the trend of wind resources locating in relatively remote geographic areas in the northern and western portions of the State. Locating resources in these areas exacerbates the issue of excess generation upstate in the absence of sufficient transmission capability to deliver the full extent of such excess to the load centers located in the southeastern portions New York (*i.e.*, the lower Hudson Valley, New York City and Long Island). This may also result in additional locational constraints in wind-rich areas of the State, adversely impacting the ability to accommodate the deliverability of the total output from the State's wind and hydroelectric resources to the system.

Market insulating incentive mechanisms also have the potential for adverse reliability implications. As noted above, reduced energy prices resulting from resources that are not responsive to price signals may place additional financial strain on other existing resources. If the reduced prices resulting from the addition of new renewable resources cause or accelerate the retirement or mothballing of other generation facilities, or stall the development of new generation, such actions could result in adverse reliability impacts.

Insulating LSRs from price signals and reducing incentives to follow dispatch instructions may also result in undermining the efficiencies gained by fully integrating wind resources into the NYISO's economic commitment and dispatch software. If LSRs that receive market insulating incentives submit offer values in a manner that seeks to maximize their dispatch, the NYISO may not be able to utilize offers to distinguish which units should be re-dispatched based on the economics of submitted offer values. This may result in system operators needing to revert to manual actions to re-dispatch wind resources and ensure continued system reliability. These manual actions often result in the removal of larger amounts of

capacity for longer periods of time than could otherwise be accomplished through the real-time dispatch and commitment software.

The absence of locational incentives for LSRs with market insulating incentives is also likely to place additional strain on the transmission system in wind-rich areas of the State. The additional concentration of resources in wind-rich regions could give rise to local reliability issues in such areas.<sup>24</sup>

In contrast, the current REC-only incentive construct utilized under the RPS program has a proven track record of success and compatibility with the competitive wholesale markets. The current REC-only incentive mechanism ensures that LSRs retain the correct incentives to respond to prices signals and dispatch instructions. Because the overall level of revenues garnered by a facility remain linked to market prices, LSRs have an incentive to locate their resources in areas of highest need and operate only when market prices are greater than the operating costs of producing energy.

The REC-only incentive construct also maintains appropriate allocation of risks between consumers and facility owners. The facility owner continues to bear the risk of correctly estimating the costs and revenues of its project and, thus, its financial viability. To ensure financial viability, this will induce the owner to manage its facility so as to maximize availability

---

<sup>24</sup> In addition to the concerns noted above, the use of long-term, bundled PPAs, financially-equivalent CFDs, utility-owned generation arrangements and/or certain State-sponsored financing scenarios may have an effect on buyer-side mitigation determinations for certain new projects, pursuant to the NYISO's current tariff rules. Those rules are only applicable to new units located in the lower Hudson Valley and New York City (*i.e.*, Load Zones G through J). The NYISO is supportive of an appropriately tailored revision to its current buyer-side mitigation rules so that certain renewable projects would be exempt from such rules. It has previously developed through its stakeholder process, and continues to support, a renewable exemption. *See, e.g.*, NYISO, *Proposed ICAP Buyer-Side Mitigation Modifications – Competitive Entry Exemption, Offer Floor Change, Renewable Generator Exemption, and Municipal Utilities/Coop Exemption* (presented May 28, 2014) at 4, available at: [http://www.nyiso.com/public/webdocs/markets\\_operations/committees/mc/meeting\\_materials/2014-05-28/Agenda%2006\\_CompulsiveEntryExemption.pdf](http://www.nyiso.com/public/webdocs/markets_operations/committees/mc/meeting_materials/2014-05-28/Agenda%2006_CompulsiveEntryExemption.pdf).

when the facility is most likely to earn the highest revenues. This helps to reduce the level of any additional consumer funded incentives deemed necessary to help spur the development of renewable facilities.

The LSR Options Paper notes that the recent modification to the RPS program to permit the use of up to 20-year REC-only contracts has produced renewed interest from renewable generation developers.<sup>25</sup> Given the relatively recent nature of this modification and the increased interest that it has already engendered, providing additional time for this modification to operate and conducting a full assessment of its efficacy before radically altering the current REC-only incentive mechanism structure appears warranted. Continuation of longer duration REC-only contracts could also be paired with a further assessment of the creative solutions proposed by the LSR Options Paper that may help reduce the financing costs of new renewable generation facilities in the State.<sup>26</sup> By reducing project costs and augmenting market-derived revenue earnings through the provision of longer duration REC-only contracts, the Commission may be able to increase the total capacity of renewable generation capable of being deployed within the confines of a fixed budget allocation. Importantly, use of this strategy would maintain consistency with the competitive wholesale markets. Such consistency ensures that the NYISO-administered markets will continue to deliver significant benefits and serve as a platform for transitioning to a fully market-based system for continued development of renewable generation in New York.<sup>27</sup>

---

<sup>25</sup> LSR Options Paper at 39.

<sup>26</sup> *Id.* at 94-95.

<sup>27</sup> Successful integration of renewable resources and capturing the benefits thereof also requires careful coordination to ensure the continued reliable operation of the electric system with increasing levels of variable generation. Renewable resources, regardless of size, should be designed to include appropriate equipment and controls to facilitate reliable system operations, such as frequency excursion protection, low voltage ride through capability and local voltage support capability. Inclusion of

### III. CONCLUSION

The NYISO respectfully requests that the Commission: (i) carefully consider these comments in determining the appropriate design for a future LSR program; and (ii) ensure that the LSR program, like the current RPS program design, maintains consistency with the competitive wholesale markets.

Dated: August 12, 2015

Respectfully submitted,

/s/ Garrett E. Bissell

Garrett E. Bissell

Senior Attorney

New York Independent System Operator, Inc.

10 Krey Blvd.

Rensselaer, New York 12144

(518) 356-6107

[gbissell@nyiso.com](mailto:gbissell@nyiso.com)

---

appropriate equipment and controls from the outset avoids the potential for costly, difficult and potentially disruptive facility modifications after the commencement of operations.



**STATE OF NEW YORK  
PUBLIC SERVICE COMMISSION**

---

**IN THE MATTER OF THE IMPLEMENTATION OF A  
LARGE-SCALE RENEWABLE PROGRAM**

---

**CASE 15-E-0302**

**Affidavit of Robert A. Sinclair, Ph.D.**

**I. Qualifications**

1. My name is Robert A. Sinclair. I am an economist and Vice-President of Potomac Economics. Our offices are located at 9990 Fairfax Boulevard, Fairfax, Virginia 22030. Potomac Economics is a firm specializing in expert economic analysis and monitoring of wholesale electricity markets. Potomac Economics currently serves as the Market Monitoring Unit for the New York Independent System Operator, Inc. (NYISO), as well as the independent market monitor for the Midcontinent Independent System Operator, Inc. and the external market monitor for the ISO New England, Inc. In these engagements, Potomac Economics is responsible for assessing the competitive performance of the markets, including assisting in the implementation of market monitoring plans to identify and remedy market design flaws and abuses of market power. Potomac Economics also provides recommendations regarding market power mitigation measures and other market rules.
  
2. I have worked as an energy economist for more than twenty years, focusing primarily on competition policy in the electric utility and natural gas industries. I have provided expert testimony and analysis regarding competition in the electric utility industry,

including market power analysis, ratemaking, open-access transmission policies, market design and merger policy. I have filed expert testimony and reports to the Federal Energy Regulatory Commission, state regulatory commissions, U.S. courts, and regulatory authorities in Canada.

3. I hold a Ph.D. in Economics from the University of Pittsburgh and a B.A. in Economics from Indiana University of Pennsylvania.

## **II. Purpose and Summary**

4. The purpose of this affidavit is to support the comments of the NYISO in the above-captioned proceeding related to the consideration of options for developing large-scale renewable projects in New York. The potential options for reform have been proposed by the New York State Energy Research and Development Agency (NYSERDA) and the Staff of the New York State Department of Public Service. The potential reform options that are the subject of the NYISO comments and this affidavit are set forth in the report titled “Large-Scale Renewable Energy Development in New York: Options and Assessment – Final Report” (June 1, 2015), hereinafter referred to as the “LSR Options Paper”.
5. This affidavit assesses options for reforming certain aspects of the procurement process for renewable resources in New York. More specifically, this affidavit focuses on reforms identified in the LSR Options Paper that would change the structure of the payments made to eligible renewable resources. Currently, eligible resources are paid a fixed Renewable Energy Credit (REC) payment based on output pursuant to long-term REC-only contracts. The eligible resource is free to manage its output into the NYISO

markets to earn additional revenues. The LSR Options Paper envisions reforms where payments to eligible resources would be extended to include energy in addition to the RECs. This bundled payment structure essentially limits the resource's exposure to NYISO energy market price signals. This option, if pursued, would reduce critical efficiency objectives that are provided by the current fixed REC-only payment structure, resulting in the potential for adverse impacts to the NYISO-administered wholesale markets.

### **III. Background**

#### **A. Role of LBMPs in Facilitating Short-Term and Long-Term Decisions**

6. This evaluation of the potential reform options set forth in the LSR Options Paper focuses on how the reform options may impact the efficiency of the NYISO markets. The primary design objective of the NYISO markets is to provide electricity customers the benefit of competition in coordinated wholesale market operations, thereby minimizing costs while maintaining reliability.
  
7. At the heart of the NYISO wholesale markets are the locational marginal spot prices for energy. Locational Based Marginal Prices (LBMPs) are calculated in the NYISO markets at hundreds of locations for both the day-ahead and real-time spot markets. These prices are formed in the day-ahead and real-time markets based on market participants' bids and offers. If market power is absent (or effectively mitigated), the markets will produce efficient LBMPs that will reflect the marginal value of energy at each location. The markets coordinate an efficient dispatch that minimizes total short-

term commitment and energy production costs. The LBMPs cause participants to have the economic incentive to follow NYISO's commitment and dispatch instructions.

8. The market pays all suppliers the single LBMP at their location, which allows a unit to earn net revenue in hours when its marginal operating cost is below the LBMP. These short-term prices will also inform longer-term investment decisions because, in significant part, these decisions are based on expected revenue in the energy markets. As a result, efficient LBMPs serve as the basis for efficient longer-term investment decisions, as well as short-term operating decisions.
9. Policies that distort the price incentives conveyed by LBMPs make the wholesale markets less effective and will lead to inefficient outcomes. If units are compensated without regard to the LBMPs at their locations (as is possible under certain of the reform options assessed in the LSR Options Paper), their dispatch will not be coordinated with the rest of the system. Instead, these units will be motivated to be dispatched in a manner that maximizes profits under their individual compensation arrangements rather than in accordance with LBMPs. To accomplish this, suppliers will self-schedule such units or modify their offers. In the end, this will raise the overall costs to the system. These dispatch effects are discussed in further detail below. In addition, this affidavit discusses the long-term effects of these alternatives on investment decisions.

#### **B. Alternative Payment Structures to Eligible Renewables**

10. Currently, large-scale renewable projects are supported through the Renewable Portfolio Standard (RPS) program, which is administered by NYSERDA. Under the RPS, eligible

resources are paid for producing renewable energy through fixed REC-only payments under long-term contracts (up to 20 years). In this way, eligible resources earn fixed per-MWh REC payments but also can sell into the NYISO energy and capacity markets and be paid accordingly. For example, if the fixed REC-only payment is \$25/MWh in an hour when the energy price is \$40/MWh, the unit could earn \$65/MWh. If the energy price increased to \$45/MWh, the unit could receive \$70/MWh. The REC-only payment is fixed but the overall revenue level received is variable and dependent on wholesale market outcomes.

11. The LSR Options Paper identifies options to change the procurement process to provide alternative payment structures that would result in the opposite effect – the REC payment would be variable but the revenue level per unit of output would be fixed. This would occur under three options being considered. Each of the three options would “bundle” the purchase of RECs and energy. One option is a long-term Power Purchase Agreement (PPA) that would include a fixed payment for both RECs and energy. The PPA would be entered into by a state entity or the electric distribution company (EDC). The developer would be paid a fixed rate for its output regardless of the market prices at the project’s location.
12. A second option is a REC “contract-for-differences” (REC CFD) that is financially the same as a long-term PPA term. The REC CFD construct would provide a payment that is based on the difference between the market-determined energy price and some guaranteed total payment amount. Under this approach, the REC payment would be directly linked to energy prices so that as the energy price increased, the REC payment

would decrease, and vice-versa. Like the PPA structure, this type of contract provides a fixed rate to the developer per MWh of output.

13. The third option is direct EDC ownership of an eligible project either by the EDC contracting with a third party to develop the projects on behalf of the EDC or the EDC directly developing renewable generation projects. The cost of these resources would be paid through EDC cost-of-service retail rates. Such rates would provide for full recovery of the prudently incurred project costs regardless of market outcomes or actual project operations.
14. The next section explains why retaining the existing fixed REC-only payment approach is the one that best serves the interests of wholesale market efficiency.

#### **IV. Comments on Reforming Renewables Procurement**

15. Each of the alternative payment mechanisms envisioned as options for reforming renewables procurement involve guaranteeing a level of revenue through long-term contracts (or, in the case of utility owned generation, through regulated retail rates). Retaining the current fixed REC-only payment structure is the preferred approach from the perspective of market efficiency. This conclusion is based on three efficiency considerations: (1) efficient dispatch; (2) efficient investment decisions; and (3) efficient allocation of market risk. Each of these considerations is further discussed below. Concerns regarding the involvement of EDCs in the procurement process are also discussed below.

## **A. Short-Term Effects**

16. Efficient LBMPs are central to the effective functioning of the NYISO markets because they provide the incentives for the least-cost units to be dispatched. Utility-scale renewable resources in New York currently are dominated by wind resources, which tend to locate in similar places due to weather patterns and development costs. Some believe that renewable resources do not need the dispatch incentives provided by LBMPs because they should operate at maximum output whenever conditions are sufficient to support such operation. The transmission system, as currently configured, was not designed in contemplation of the concentration of these resources in discrete locations. As a result, the system may not be capable of delivering the full output of these facilities, resulting in congestion.
17. When congestion causes LBMPs to be relatively low at a particular location, this is a signal that the system requires lower output at that location to reduce the flows over the constraint and manage the congestion efficiently. If units are not responding to the signals produced by the lower LBMPs, then the prices will be further reduced. The resulting lower prices are exacerbated by insulating units from the incentives inherent in LBMPs, such as would occur by providing fixed bundled payments to renewable resources.
18. Similarly, when LBMPs are high at a particular location, this provides a signal to the market that additional energy is valuable at that location. However, units that are insulated from the higher LBMPs (as would occur under the bundled long-term contract structures for renewable resources proposed by the LSR Options Paper) will not

necessarily respond efficiently. Indeed, such price insulation may incentivize renewable resources, such as wind units, to undertake routine maintenance during high load summer periods when there is typically decreased wind velocity. Units receiving fixed price bundled contracts are indifferent to price because they receive the same level of revenue earning regardless of market outcomes. The decreased wind velocity during such high load periods allows the unit to maximize revenue earnings because forgone output is the lowest. As a result, costs to customers will rise as the markets are forced to rely on higher-cost resources to meet the system's needs.

19. The foregoing problems are likely to arise under the proposed reform options that would provide bundled REC and energy payments to eligible renewable resources. Payments to these resources will be tied to production volumes, not LBMPs optimized by the markets. Every unit of output under such contracts results in positive net revenue. This will tend to cause the adverse scheduling and offer incentives described above. Conversely, energy offers by resources receiving fixed REC-only payments will be more closely correlated with the resources' operating costs. At sufficiently low price levels, a resource receiving a fixed REC-only payment will reduce its dispatch to avoid the potential for incurring losses. Hence, fixed REC-only contracts will result in more efficient commitment decisions and preserve the incentive to follow NYISO's dispatch instructions.

#### **B. Long-Term Effects**

20. The fixed REC-only payment mechanism is also superior to bundled REC and energy payment structures when considering longer-term incentives involving investment and



locational choices. The fixed REC-only construct can more efficiently reveal the underlying value of capacity and energy at various locations and the underlying value of energy delivered at different times. At locations with high LBMPs, a renewable resource receiving a fixed REC-only payment will be able to earn higher energy revenue. This allows the unit to offer a lower per REC price and reduce overall renewable procurement costs. This provides appropriate incentives to install resources at higher value locations. This can also provide incentives for higher-installed-cost projects to be developed in high-price areas that are less costly on a net basis than a lower-installed-cost projects at low-price locations. Resources that are compensated in the energy market at LBMPs will efficiently balance development costs, local operating benefits (like wind velocity), and the locational benefit to the grid (reflected in energy prices). Resources that are insulated from LBMPs will balance only the development costs and operating benefits. This will cause developers to make inefficient locational choices. For example, developers may build at locations that cause or exacerbate congestion. The fixed REC-only payment structure provides the correct incentives for developers to balance all three key variables and facilitates efficient investment decisions.

21. A fixed REC-only payment mechanism will also provide incentives for developing resources that are flexible and can respond to variability in demand. Such resources could earn higher revenues than resources that are intermittent and lack such flexibility. The fixed REC-only payment structure reflects this added value to the system and strengthens incentives to develop more flexible and controllable resources. The bundled REC and energy payment structure, on the other hand, is based on a fixed per-MWh

payment and would favor resources in locations where installed costs are low without regard to the benefit of locating where capacity is needed.

### **C. Risk Allocation**

22. Another important consideration when assessing the benefits of alternative payment structures is the efficient allocation of risk management. One of the main virtues that are pointed to by proponents of fixed price, bundled REC and energy contracts is that such contracts isolate the resource from fluctuating energy prices. This reduces development risk, and consequently, reduces the cost of insuring against risk. However, the inherent energy price risk is not reduced, it is just shifted to customers. In fact, by shifting risk to customers (who cannot control it), risk may actually increase. Under a fixed REC-only payment structure, the developer would face the risk of correctly estimating the costs and revenues of its project based on the proposed resource technology and location. This will induce the owner to manage its resource so that it is available when it is most likely to earn the highest revenues, thereby reducing the price risk.
23. Under a bundled REC and energy payment approach, a resource owner does not face the risk of energy price changes because its payment is based on a fixed hourly rate. Accordingly, any manageable risk may be ignored (or even incurred) despite measures being available to manage it.

### **D. Electric Distribution Company Participation**

24. The option to involve EDCs in the administration of renewable procurement introduces other concerns aside from distorting price incentives and shifting risk allocation. Certain

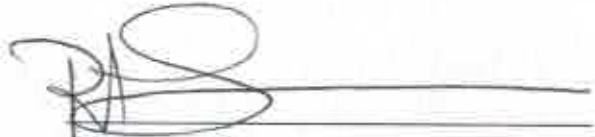
of the potential reform options propose to include EDCs in administering the solicitation process, making payments to the selected renewable projects under long-term agreements, and recovering the costs associated with renewable generation procurements from customers under regulated retail rates. These options could also include the EDC developing its own renewable generation resources or purchasing resources from third-party developers.

25. One potential problem with these approaches is it can lead to vertical re-integrating of the supply and distribution/transmission functions. These functions were separated in the 1990s to improve incentives and competition, and ultimately to lower costs. While the amount of renewables that are likely to be integrated in the short-term may be relatively small, over the longer-term, renewable capacity could be substantial.
26. Ultimately, vertical re-integration raises the potential concern that a company could use control of its distribution (or transmission) assets to favor its supply function or raise the costs of competing suppliers and developers.
27. As noted by the LSR Options Paper, a second concern involves the EDC administration of the solicitation process. The LSR Options Paper acknowledges that if developing these projects is profitable, an EDC may have the incentive to bias the selection of projects in its favor. For example, the EDC may have the opportunity to structure the requirements or the evaluation in a manner that favors its own projects. Hence, the solicitation process would have to be closely monitored under this approach.

28. These concerns can be monitored and managed, but will increase overall program costs and administrative burdens. Avoidance of EDC participation, on the other hand, would avoid these concerns entirely. Given the potential concerns regarding EDC solicitation and ownership of renewable projects, Potomac Economics recommends this approach be considered only if there are substantial benefits that cannot be achieved under other approaches.
  
29. This concludes my affidavit.

ATTESTATION

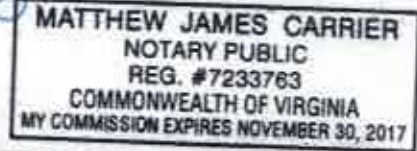
I am the witness identified in the foregoing Affidavit of Robert A. Sinclair, Ph.D. I have read the affidavit and am familiar with its contents. The facts set forth therein are true to the best of my knowledge, information and belief.



Robert A. Sinclair, Ph.D.

Subscribed and sworn before me this 11<sup>th</sup> day of August, 2015

Notary Public



My commission expires: November 30, 2017

**CERTIFICATE OF SERVICE**

I hereby certify that I have this day served the foregoing document upon each person designated on the official service list compiled by the Secretary in this proceeding.

Dated at Rensselaer, NY this 12<sup>th</sup> day of August, 2015.

*/s/ Joy A. Zimmerlin*

Joy A. Zimmerlin  
New York Independent System Operator, Inc.  
10 Krey Blvd.  
Rensselaer, NY 12144  
(518) 356-6207