STATE OF NEW YORK PUBLIC SERVICE COMMISSION

Proceeding on Motion of the Commission to
Consider Resource Adequacy Matters Case 19-E-0530

INITIAL COMMENTS OF POTOMAC ECONOMICS, LTD.

Pursuant to the Notice Soliciting Public Comments that was issued on August 8, 2019, Potomac Economics respectfully submits initial comments in the above-captioned proceeding and requests that its statement be accepted into the record of this proceeding.

Potomac Economics currently serves as the Market Monitoring Unit ("MMU") for the New York Independent System Operator, Inc. ("NYISO"). The NYISO Market Services Tariff requires the MMU to help ensure that the NYISO's markets are created and operated in a "robust, competitive, efficient and non-discriminatory" manner.[1] As the MMU, we are also responsible for reporting on: "…the performance of the wholesale markets to the ISO, the [FERC], and other interested entities such as the New York Public Service Commission and participants in its stakeholder governance process".[2]

Potomac Economics is interested in ensuring the long-term efficiency of New York's electricity markets, and Potomac Economics' interests cannot be adequately represented by any other party. These comments discuss the value of the competitive wholesale market for ensuring resource adequacy in manner that reduces costs for consumers and for integrating intermittent

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1 See NYISO's Market Administration and Control Area Services Tariff ("Market Services Tariff" or "MST") Attachment O §30.1.2.

2 See MST Attachment O §30.4.5.2.

renewable generation and other public policy resources in an efficient and reliable manner. We hope these comments will be helpful to the Commission as it develops a record in the above-captioned proceeding.

I. BACKGROUND AND INTRODUCTION

The New York Public Service Commission ("the Commission") has raised fundamental questions regarding alternative means to maintain resource adequacy in New York. New York has historically relied on competitive wholesale electricity markets that minimize the as-offered costs of satisfying New York's local resource needs. These markets establish prices that facilitate efficient long-term investment and retirement decisions by private market participants. The Commission has inquired about the potential effectiveness of alternative resource adequacy programs such as the state-directed long-term contracting model currently used in California. The California Public Utility Commission directs utilities to enter into long-term contracts with individual generators to satisfy resource adequacy requirements and certain policy objectives.

In these comments, we describe the value that competitive markets have provided to New York. Importantly, robust market incentives will be needed for New York State to satisfy its ambitious public policy objectives at a reasonable cost. State-directed long-term contracting like the model used in California will be insufficient to the task of transforming the current resource mix to one that can achieve the goal of zero power sector emissions by 2040 while maintaining reliability. The California Public Utility Commission recently identified significant shortcomings with this model, including that it leads to "costly out-of-market [resource adequacy] procurement" and has directed stakeholders to explore alternatives.[3] We agree that this model would result in substantial cost increases for New York State consumers.

[3] See *Decision Refining the Resource Adequacy Program*, Decision 19-02-022 of the Public Utilities Comission of the State of California, February 21, 2019, page 18.

Section II of this filing explains how the current NYISO wholesale market can facilitate New York State policy objectives by providing beneficial investment signals. These signals help shift investment towards renewable energy projects that are more effective in displacing fossil-fuel generation as well as flexible resources that are more effective in helping to integrate intermittent renewable generation.

Sections III and IV discuss how investment signals could be further enhanced by several recommended reforms to the energy and ancillary services markets and the capacity market. These reforms would improve elements of the current market design that under-compensate clean flexible resources, while systematically over-valuing older inflexible generation.

Lastly, Section V discusses the fundamental principles underlying NYISO's Buyer Side Mitigation rules. The BSM rules were not designed to impede the ability of New York State to fulfill public policy objectives. This section identifies how the BSM rules can be modified to facilitate public policy objectives while ensuring the capacity market continues to provide efficient incentives to maintain capacity needed to satisfy resource adequacy criteria.

Taken together, these changes will improve the ability of the market to facilitate the necessary investment to achieve New York's public policy goals by: a) significantly improving the economics of renewable energy resources and the flexible resources needed to integrate them, and b) encouraging the transition away from less-flexible conventional resources. Importantly, these changes will also maintain the commitment to competitive wholesale markets that will be needed to continue to satisfy NYISO's short and long-term reliability requirements at the lowest cost to New York's consumers.

II. ROLE OF MARKETS IN FACILITATING STATE POLICY OBJECTIVES

Robust markets have tremendous potential to harness the ingenuity of individuals to create novel solutions to environmental policy issues. State-directed long-term contracting mechanisms

can never hope to be as effective as an efficiently designed market. New York State's ambitious policy objectives will be difficult to achieve if market participants have economic incentives that are at odds with the policy objectives. Thus, New York State policy makers can achieve their objectives more quickly and cost-effectively if they can rely on electricity markets that provide resource owners with the right incentives. A well-functioning market is important even to subsidized resources whose long-term profitability will be determined in part by future revenue streams from selling capacity, energy, and ancillary services in the NYISO market. This section discusses some of the ways that the current NYISO market design helps facilitate investment in resources that are more effective for integrating renewables and displacing fossil-fuel generation.

New York State's plans will require vast amounts of new intermittent renewable generation from solar and wind. Large amounts of flexible supply-side and demand-side resources will be needed to balance variations in intermittent renewable generation. The NYISO energy and ancillary services markets reward resources that can:

- Come on quickly during tight supply conditions, and can shut down when prices fall in response to surplus supply conditions;
- Relieve transmission bottlenecks that limit output from renewable generation; and
- Provide reserve capacity to back-up intermittent renewable generation at a low cost and with little or no pollution.

These wholesale market incentives guide investment towards projects that provide greater value to the system. For example, energy storage developers have incentives to locate where they can be more effective in helping intermittent renewable resources to be more deliverable to load centers, and to satisfy local reserve requirements. Well-functioning markets will also provide incentives to retire older inefficient conventional units while retaining more flexible conventional

units that will help integrate renewables. These incentives are illustrated in the following analyses.

The following analysis illustrates how the profitability of an investment in New York depends on the value of power where the generator interconnects. Figure 1 shows the internal rate of return for an equity investor in renewable generation and battery storage projects at various locations in New York. This analysis shows results for land-based wind, utility-scale solar, and battery storage resources each at three locations.[4][5][6] For each technology, the figure shows a range for a "normal" rate of return to an equity investor (i.e., cost of equity) for such a project to indicate the relative profitability of these investments.

Figure 1 shows significant variations in the profitability of investments by location. For the assumed REC contract price level, the land-based wind investor would earn a nominal rate of return of nearly 13 percent in the West Zone (i.e., Zone A) compared to seven percent in the North Zone (i.e., Zone D). While this could vary significantly with spot market conditions, this analysis illustrates the strong incentives of the market. Ultimately, this will attract investors to areas like the West Zone where they will be willing to accept a lower REC contract price, which should benefit rate payers.

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4 For land-based wind, the Production Tax Credit and annual net revenues from capacity, energy, and ancillary services are based on a unit in service from October 2018 to September 2019. This analysis assumes each resource has a contract with NYSERDA for renewable energy credits for 20 years at $22.4/MWh. The cost of new entry is based on a unit that begins operation in 2019.

5 For utility-scale solar, the annual net revenues from capacity, energy, and ancillary services are based on a unit in service from October 2018 to September 2019. The Investment Tax Credit and the cost of new entry are based on a unit that begins operation in 2024 (assuming safe-harbor provisions for the ITC). This analysis assumes each resource has a contract with NYSERDA for renewable energy credits for 20 years at $22.4/MWh.

6 For battery storage resources, the cost of new entry is based on a unit that begins operation in 2024. This analysis assumes these resources receive NYSERDA's Bulk Storage Incentives for projects entering after the closure of Class Year 2019.

Figure 1: Return on Equity for New Entrants by Technology and Location

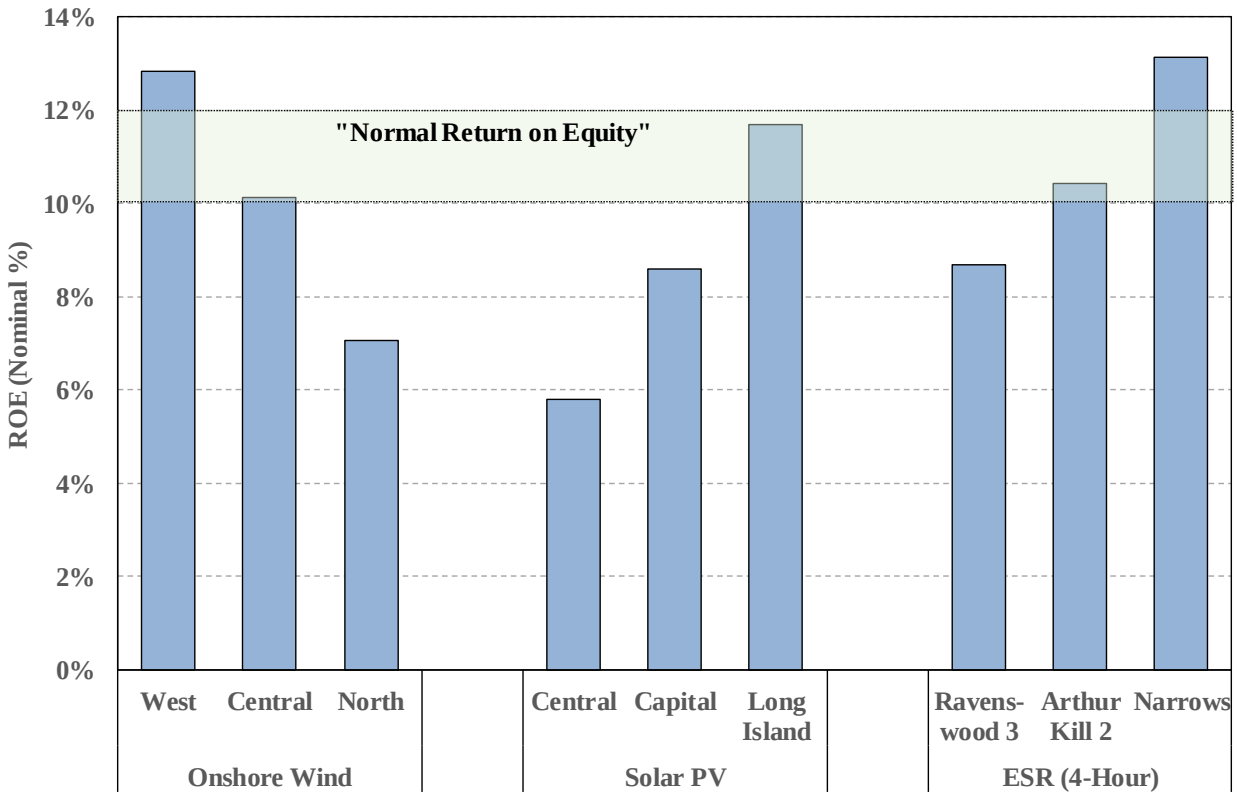


Figure 1 also shows that location will play a strong role in attracting investments in solar and battery storage to areas with greater value. The costs of these technologies are falling, so the figure combines projected costs and federal tax incentives for installations coming online in 2024 with wholesale market revenues from a recent 12-month period. The figure shows a significantly higher return for utility-scale solar in Long Island than in the Central Zone because of higher energy and capacity prices. For battery storage resources, the return is substantially higher at the two locations on the 138kV system where congestion is more prevalent (i.e., Arthur Kill 2 and Narrows). Ultimately, these investment signals help attract developers to locations that provide greater value to the power system and reduce the eventual cost of satisfying state policy objectives.

While New York State has ambitious renewable energy targets, the current penetration of intermittent renewables is still modest. As the penetration increases, the NYISO market will

experience more price volatility and a greater need for flexible resources that can balance intermittent renewables.

Figure 2 summarizes how the net revenues of a resource are expected to change as the penetration of intermittent renewables increases for three technologies: a high-efficiency combined cycle generator ("CC 2x1"), a fast-start unit ("LMS"), and a 4-hour battery storage resource. The figure shows the evolution of average clearing prices, price volatility, and net revenues in the northern region of the Southwest Power Pool where the penetration of land-based wind increased from 14 percent of load in 2015 to 24 percent in 2017.[7]

Figure 2: Net Revenue in Shoulder Months Before and After Intermittent Penetration

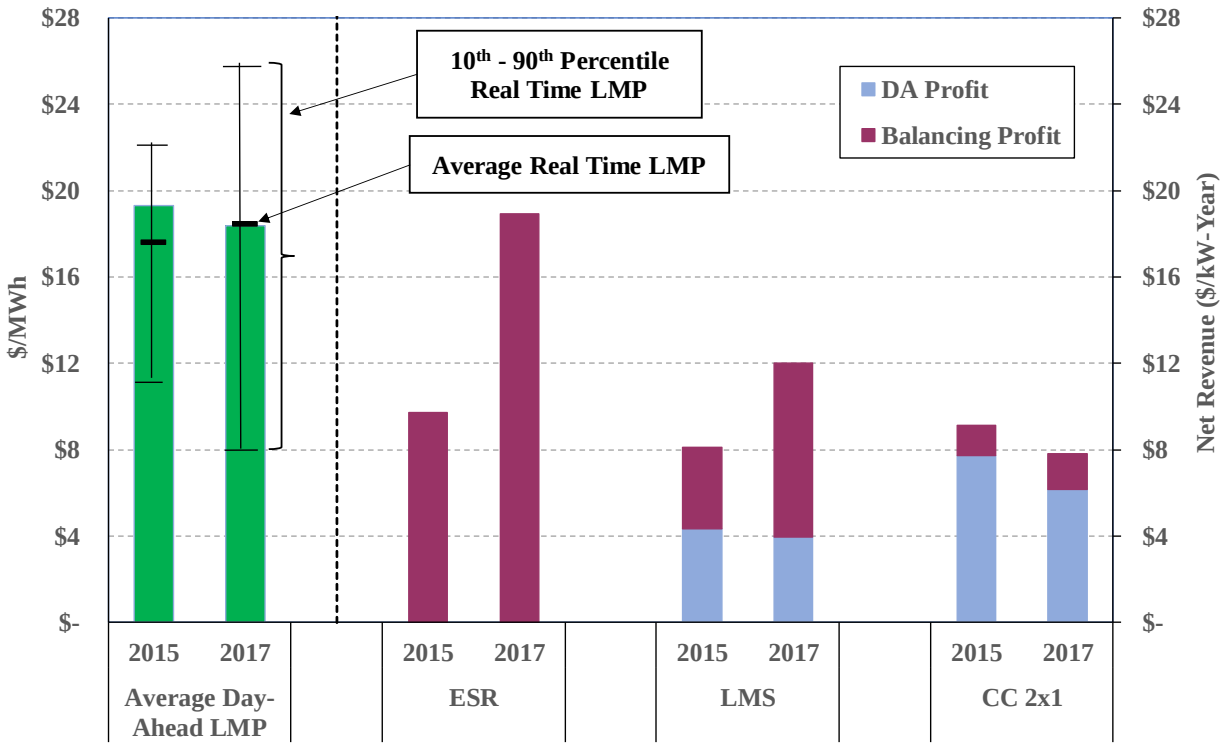


Figure 2 shows that day-ahead LMPs fell slightly (15 percent) from 2015 to 2017 even as natural gas prices increased significantly (8 percent) and while the volatility of real-time LMPs

[7] LMPs and other clearing prices are based on the North Hub location in the Southwest Power Pool. The months we considered for this analysis include February, March, May and October.

rose markedly over the same period. Likewise, the high-efficiency combined cycle generator experiences a 11 percent reduction in net revenues because of the declining spark spread between the electricity price and the cost of fuel. The fast-start peaking unit also experiences a decrease in day-ahead energy revenues, but these are offset by a significant increase in balancing energy profits and ancillary services net revenues. In contrast, the battery storage resource experiences a 101 percent increase in net revenue, since its flexibility allows it to benefit most from real-time price volatility. This shift in favor of flexible resources will continue as investment in intermittent renewable resources increases and leads to more volatile prices in the day-ahead and real-time electricity markets.

These analyses demonstrate how the NYISO market is currently designed to provide incentives that facilitate efficient investment decisions. The second analysis shows that as a market with similar rules increases intermittent generation, it will also provide stronger incentives for resources with flexible operating characteristics that will help integrate intermittent renewables. While these analyses are based on a small number of proven technologies, the underlying principle—that efficient markets provide strong investment incentives for resources with desirable attributes—will hold true for all technologies.

III. ENERGY & ANCILLARY SERVICES MARKET REFORMS THAT WOULD FACILITATE STATE POLICY OBJECTIVES

The prior section shows that the current market will provide increasing attractive incentives for renewable resources, storage resources, and other flexible resources. However, we recommend improvements to further enhance the performance of the markets. In our role as the NYISO's Market Monitoring Unit, we have recommended additional energy and ancillary

services market reforms that would further enhance investment incentives.[8] These recommendations are based on our findings that low-cost flexible resources are systematically under-compensated for operating reserves, while the costs borne by emitters of carbon dioxide emissions are far below the level that New York State environmental policy is based on. Hence, enhancing the NYISO market rules to recognize the value of these resources would promote investment in resources that would reduce emissions and help integrate intermittent renewables in a cost-effective manner.

Our most recent SOM Report evaluated the effects of adopting the following four recommendations:

- "N-1" – Recommendation #2016-1 would compensate reserve providers that relieve congestion, which increases import capability to NYC.
- "LRR" – Recommendation #2017-1 would create reserve markets to reward reserve providers that maintain reliability in NYC load pockets.
- "ORDC" – Recommendation #2017-2 would raise reserve shortage pricing levels when the New York Control Area is short of 10-minute or 30-minute reserves.
- "Carbon Pricing" – This would provide market-based signals to reduce emissions and encourage development of low-emitting and zero-emitting generation.

These recommendations would reward resources for being flexible and available at low cost by better recognizing their value for reliability and congestion management. In a high intermittent penetration environment, these characteristics would allow increased imports of renewable energy to load centers.

The following analysis simulates the net revenues for the new thermal peaking unit which was used in the analysis that set the NYISO's current Capacity Demand Curves. Net revenues are estimated for a New York City generator assuming a resource mix that is anticipated in the

[8] See Section XI of the 2018 State of the Market for the New York ISO Markets.

middle of the next decade. Specifically, the resource mix includes retirement of Indian Point and all New York City peakers not needed to satisfy local transmission security needs as well as the interconnection of 1.3 GW of offshore wind and achievement of the 50 percent renewable goal, although it does not include significant penetration of battery storage resources. The "Status Quo" estimate of net revenue is shown based on the current market rules. The figure also shows the incremental effects on net revenue of the four recommended market enhancements listed above. The "With Enhancements" category shows how the capacity demand curve would fall if the four market enhancements were implemented with the net revenue impacts shown below.

Figure 3: Net Revenues for the NYC Demand Curve Unit

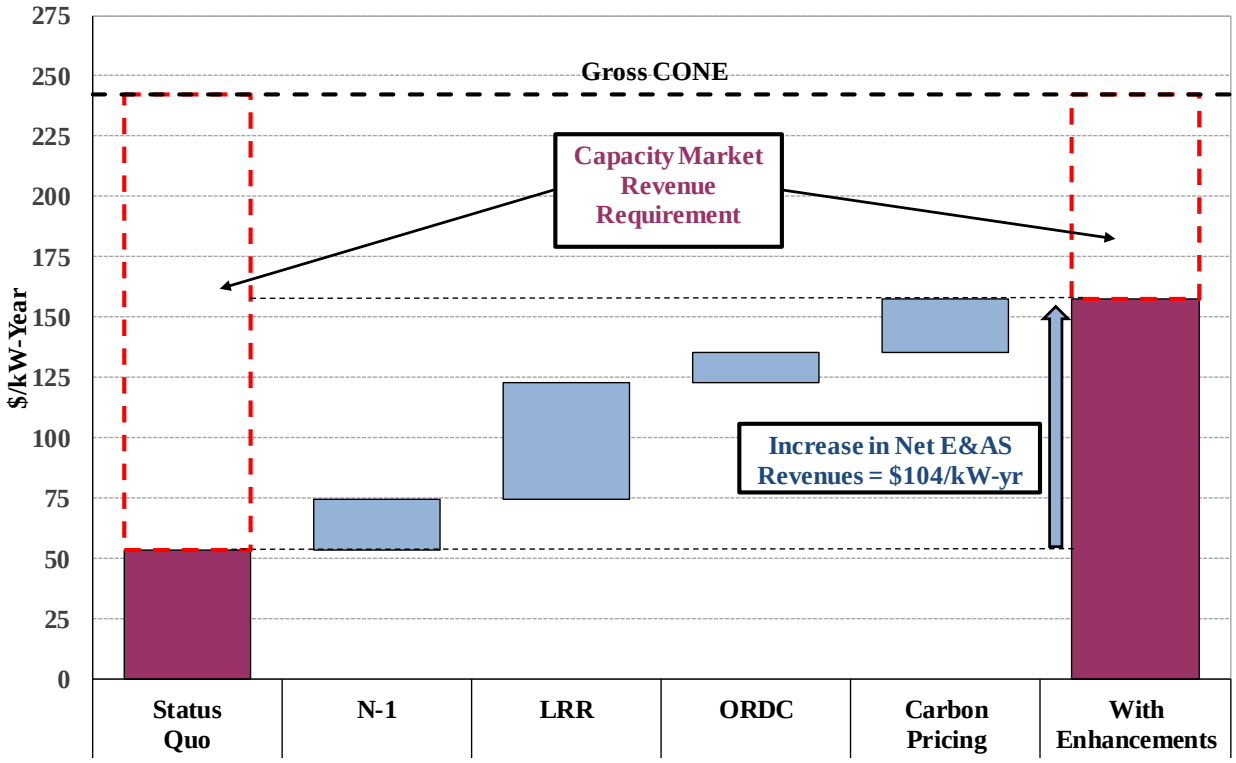
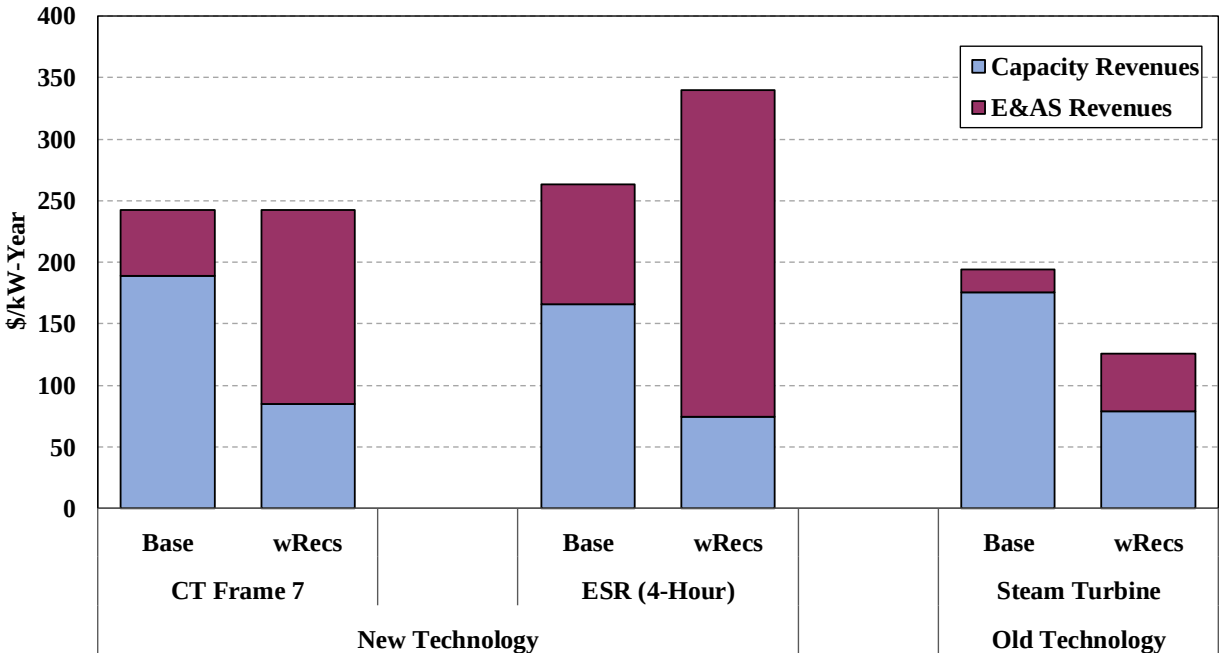


Figure 3 illustrates how the recommended market enhancements would increase the profitability of a flexible thermal unit. This would, in turn, reduce the amount of revenue that would need to be recovered through the capacity market ("Capacity Market Revenue Requirement") from around $189/kW-year to around $85/kW-year. Consequently, we expect

that these market reforms would generally shift investment away from older inflexible inefficient fossil generation, which rely on capacity payments for the vast majority of their revenue, towards newer flexible efficient resources, which would help to better integrate the intermittent renewable generation. This investment would, in turn, dampen the net revenue impacts shown in the figure.

The next analysis illustrates how these changes in price signals would affect the net revenues for three technologies at "LOE conditions" (i.e., when there is a modest surplus of capacity as modeled in the demand curve reset process).

Figure 4: Effect of Market Enhancements on Annual Net Revenues in NYC by Technology



The figure above illustrates that efficient energy and ancillary services market reforms would produce very strong market signals. The CT Frame 7 unit is the demand curve unit, so the increase in E&AS net revenues is balanced by the reduction in capacity revenues. The battery storage resource also receives much less capacity revenue, but this is more than made up for by

the increase in E&AS net revenues. In contrast, the steam turbine experiences a large reduction in overall net revenues.

The net revenue impacts in Figure 4 are likely overstated because the analysis does not consider the effects of new entry of flexible efficient resources that would be motivated by the market design enhancements. Hence, the enhanced price signals would attract investment that would tend to reduce the expected magnitude of price changes. Such investment would promote New York State efforts to increase the use of renewable energy and reduce reliance on fossil fueled generation.

IV. CAPACITY MARKET REFORMS THAT WOULD FACILITATE STATE POLICY OBJECTIVES

In addition to the reforms to the energy and ancillary services markets discussed in the prior section, improvements in the capacity market can also play an important role in facilitating public policy objectives. In this section, we discuss two key reforms that will improve the ability of the capacity market to achieve these objectives. We also explain why a state-directed procurement process would not be an effective or efficient alternative to the NYISO's current markets.

A. Key Capacity Market Reforms

In recent years, the NYISO has refined its rules for valuing capacity from demand-side, intermittent, and energy-limited resources. We have generally supported these efforts to compensate resources more appropriately, however, the NYISO has not engaged in a comparable effort for conventional generators with characteristics that diminish their reliability value. We are concerned that the current rules over-value two categories of generation with diminished reliability value.

First, large generators provide less reliability value than an equivalent amount of capacity of small generators because a portfolio of large generators is more likely to experience an unusually large amount of unavailable supply than a portfolio of small generators. For example, a 400-MW generator with a 5 percent EFORd has a 5 percent chance of being unavailable during peak system conditions, while the probability that four 100-MW generators with the same EFORd will be simultaneously unavailable is just ~0.00006 percent. Consequently, the reliability impact of outages of large resources is greater than the impact of outages of small resources. Hence, we recommend that the NYISO use its resource adequacy model (GE-MARS) to adjust the capacity value of resources based on size.

Second, generators that have long start-up notification times and run very infrequently are compensated the same as resources that are available on short notice. However, low capacity factor units with long start-up notification times are less likely to be on-line and available during reserve shortage conditions. As the penetration of intermittent generation increases, it will become harder to predict when long start-up notification units need to be started-up to maintain reliability. Hence, we recommend that the NYISO use its resource adequacy model to estimate how the reduced availability of long lead time units would diminish their value for reliability and adjust their capacity compensation accordingly. The reliability value of such units should fall as the penetration of intermittent renewable generation increases.

These reforms would be beneficial because they would result in more efficient investment signals for capacity resources. To the extent that older generators retire, these reforms would shift incentives towards retaining resources that provide greater reliability value (and retiring older low-value resources). Ultimately, this would increase capacity payments to public policy resources and to the flexible resources that are needed to integrate intermittent

resources. We are currently finalizing a model to estimate the value of large-sized generators and long lead time generators discussed above, and we expect to publish results later this year.

Because these market enhancements, together with the energy market enhancements discussed in Section III, will make public policy resources more economic, they will reduce the extent to which public policy resources are subject to buyer-side mitigation. In Section V, we discuss potential changes to the buyer-side mitigation process that will increase the extent to which the buyer-side mitigation measures accommodate the public policy resources.

B. State-Directed Procurement as an Alternative to Competitive Markets

The Commission Notice solicits comments on alternative procurement mechanisms, calling out as an example the mechanism used in California. However, the California PUC is currently engaged in a proceeding to modify the current state-directed long-term contracting model, stating that this model leads to "costly out-of-market [resource adequacy] procurement due to local procurement deficiencies" and does not provide "cost effective and efficient coordinated procurement."[9] Accordingly, the California PUC has directed stakeholders to explore alternative mechanisms.

In this context, a group of community choice associations, transmission owning utilities, and generators have filed a joint motion adopting a settlement agreement, which would create a "residual central procurement" to satisfy resource adequacy requirements. This proposal has the essential characteristics of the capacity markets that are used in NYISO, PJM, and ISO-NE. This would allow load serving entities to engage in bilateral contracts and provide for price

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[9] See *Decision Refining the Resource Adequacy Program*, Decision 19-02-022 of the Public Utilities Comission of the State of California, February 21, 2019, page 18.

transparency, while ensuring sufficient resources to maintain reliability.[10] Participants and policy-makers in California have begun to recognize the value of relying on competitive markets to facilitate public policy objectives in a cost-effective manner.

V. BUYER SIDE MITIGATION REFORMS THAT WOULD FACILITATE STATE POLICY OBJECTIVES

The BSM rules play a critical role in ensuring that out-of-market investment does not suppress capacity prices below competitive levels in the short-run. The BSM rules should strike a reasonable balance between: (a) protecting the integrity of the market by ensuring efficient capacity prices and (b) facilitating New York State's efforts to shape its resource mix to achieve certain policy objectives. Given New York's increasingly ambitious agenda for promoting clean energy policies, the BSM rules should be evolved to maintain a proper balance between these two objectives. An efficient capacity market that produces just and reasonable prices will become increasingly important to subsidized resources whose long-term profitability will depend in part on future revenue streams from selling capacity in the NYISO market. This section discusses the existing BSM measures and how they may be modified to allow New York State to fulfill its legitimate public policy objectives while protecting the integrity of the market.

A. Principles and Objectives of the BSM Rules

The BSM measures were originally designed to prevent entities from suppressing capacity prices below competitive levels by subsidizing uneconomic new entry of a conventional generator. The BSM measures deter such anticompetitive conduct by imposing an Offer Floor that prevents the new generator from selling capacity at prices below its costs. Hence, the BSM

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[10] See *Joint Motion Of California Community Choice Association, Calpine Corporation, Independent Energy Producers Association, Middle River Power, NRG Energy, Inc., San Diego Gas & Electric Company (U 902-E), Shell Energy North America (US) L.P., and Western Power Trading Forum for Adoption of a Settlement Agreement for a "Residual" Central Procurement Entity Structure For Resource Adequacy* in R.17-09-020 of the Public Utilities Comission of the State of California, August 30, 2019.

measures largely prevent the new generator from suppressing capacity prices, so a large entity will be deterred from subsidizing new entry when its primary purpose would be to suppress prices.

The BSM measures are not intended to deter states from promoting clean energy and other legitimate public policy objectives. Indeed, the Federal Energy Regulatory Commission has affirmed the right of states to exercise "their traditional authority over electricity generation and retail operations—encourage renewable resources and direct the planning decisions of electric utilities within their jurisdiction."[11] However, the BSM measures are an important tool for ensuring a workable balance between facilitating state policy objectives and ensuring that prices are just and reasonable. This balance is critical because if market participants lose confidence in the market and the competitiveness of future prices, the market will fail to fulfill one of its primary purposes—to facilitate efficient private investment and retirement decisions. This confidence is important even to subsidized resources whose investment decisions are motivated in part by expected future revenue streams from selling energy, ancillary services, and capacity in the NYISO market.

Just and reasonable capacity prices are particularly important for the NYISO because it operates a spot market where the capacity price is set based on the level of supply and a "demand curve" based on the annualized cost of new entry of a conventional generator assuming a 20-year investment horizon. When supply increases significantly above the resource adequacy requirement, capacity prices fall below the annualized Net CONE. Conversely, when the surplus falls near the requirement, capacity prices rise above Net CONE. Hence, investors risk capital to

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[11] See *Village of Old Mill Creek, et al. v. Star, et al.*, (7th Cir. 2018), Brief of the United States and the Federal Energy Regulatory Commission as *Amici Curiae*, May 29, 2018, p. 26.

build generation based on the assumption that the NYISO will remain committed to competitive markets over the 20+ year investment horizon.

Although the primary objective of subsidies for clean energy is to promote environmental policy, ambitious policies that add large amounts of supply without removing less-clean existing generation tend to suppress prices in the short-term. Indeed, NYSERDA's recent offshore wind study acknowledges that subsidies for offshore wind will reduce wholesale market prices (if they are granted Renewable Energy Exemptions from the BSM measures), thereby offsetting the cost of subsidies that are ultimately passed on to consumers.[12] For this reason, the Federal Energy Regulatory Commission has generally supported the creation of mitigation exemptions for renewable energy projects when the quantity of new entry does not overwhelm the wholesale market and suppress prices. However, the existing BSM rules are likely inadequate to facilitate the magnitude of new entry of public policy resources that is now desired by New York State.

For subsidized resources that do not receive a renewable exemption from mitigation, the Part A Test Exemption provides a mechanism for selling capacity as long as there is a reasonable balance between supply and demand. The Part A Test generally allows any resource to receive an exemption as long as its entry would not raise the capacity surplus to more than 5 to 6 percent of the capacity requirement. New York State policies will lead to the retirement of up to 6 GW of generation from 2020 to 2025,[13] and this should allow most subsidized resources to receive Part A Test Exemptions. However, these retirements may also encourage investment in new conventional resources that would increase the capacity surplus beyond the level that would

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12 See Appendix E.4 of NYSERDA's (2018) *Offshore Wind Policy Options Paper*.

13 For instance, NOx-emission limitations that will affect ICAP 3.3 GW of older peaking units in Zones J and K by 2025. The retirement of the Indian Point nuclear plant (in 2020 and 2021) in accordance with an agreement with the State would remove 2.1 GW from the market. The state's policy to phase out all coal power plants would result in retirement of over 0.8 GW of capacity.

allow subsidized resources to pass the Part A Test. Hence, we are concerned that the current BSM rules might allow new conventional resources to enter and thereby preempt capacity sales from new resources that are subsidized for legitimate state policy reasons. This highlights a circumstance where the current BSM rules would impede state policy goals even where the subsidized resources would not suppress capacity prices. The next subsection identifies several BSM rule enhancements that could be adopted to address this concern.

B. Potential Enhancements to the BSM Rules

In considering possible enhancements to the existing BSM rules, it is important to focus on how State policies can adversely affect the markets. Subsidized entry in the wholesale electricity market is problematic to the extent that it artificially alters the supply-demand balance, which leads to volatile prices and increased financial risk. To the extent that the BSM rules can minimize artificial changes in the supply-demand balance resulting from public policy initiatives, these rules will protect the integrity and performance of the capacity market. Thus, the BSM rules should be modified to allow subsidized resources to sell capacity whenever it would not result in artificial capacity price suppression. This subsection discusses two potential approaches for modifying the BSM rules.

The first approach would be based on ISO-NE's CASPR framework for accommodating state-sponsored resources. If this framework was adapted to the NYISO market, a subsidized resource (that is initially mitigated) could acquire a capacity obligation from an existing resource that would agree to retire as part of a bilateral agreement between the two parties. This framework would allow state-subsidized resources to enter the market and sell capacity, while ensuring that this does not lead to large capacity surpluses. However, large amounts of capacity are already expected to retire as a result of New York State environmental policies (including up to 6 GW from 2020 to 2025), and additional economic retirements are likely if the NYISO

moves forward with market reforms discussed in Sections III and IV, so we discuss an alternative approach below that may be better-suited to allow state policy resources to enter and sell capacity in New York.

When existing generation retires because of environmental or economic reasons, it should provide space for subsidized resources to enter the market. However, news of the upcoming retirements has helped motivate new entry of 2 GW of low-cost merchant gas-fired generation from 2018 to 2020, thereby increasing the capacity surplus. Under the current BSM rules, this merchant new entry effectively preempts capacity sales from resources that are subsidized for policy reasons. Hence, we propose a second approach to evolving the BSM rules that would ensure that resources subsidized by the state to promote legitimate policy objectives would be first in line to receive exemptions from mitigation. This rule change would ensure a reasonable supply-demand balance because it would deter some conventional generators from entering the market because the expected capacity sales from subsidized resources would make the conventional generators expect to be less profitable. This alternative approach to modifying the BSM rules would require two rule changes that are discussed in the next Subsection.

C. Proposal to Create a Public Policy Resource Evaluation

Existing conventional generators are expected to retire in the coming years because they will become less economic and/or because of tightening environmental standards in New York state. This will create natural opportunities for new state policy resources to enter the market at a pace that will not lead to excessive surpluses as long as the BSM rules can be modified as discussed in this subsection. The problem with the current rules is that new conventional generation may be encouraged to enter the market and effectively preempt the state policy resources from receiving exemptions from the BSM rules. We recommend two rule changes to address this concern.

First, we propose to create a BSM provision defining a Public Policy Resource Evaluation, which would modify the BSM exemption process for resources that are subsidized for legitimate state policy reasons ("Public Policy Resources" or "PPRs"). The current BSM process tests each project in the NYISO's interconnection Class Year in order, ranking each project from lowest to highest based its Unit Net CONE (which is an estimate of its annual net cost of new entry). Thus, low-cost conventional generators are tested before most subsidized resources. Consequently, when a subsidized resource is evaluated for a Part A Test exemption, the capacity surplus will have been increased by any low-cost conventional generators already receiving exemptions. The ranking of projects solely based on cost criteria puts state policy resources at a disadvantage.

For example, suppose 400 MW of BSM exemptions are opened up by the retirement of an existing generator. If a new low-cost conventional 500-MW generator is tested first and receives a Competitive Entry Exemption from the BSM rules, it will preclude capacity sales from higher-cost battery storage resources that are receiving subsidies. Thus, even when retirements would create opportunities for the entry of new public policy resources, the current BSM process will tend to allow low-cost conventional generators to jump ahead and effectively preempt capacity sales from the public policy resources. The proposed Public Policy Resource Evaluation would correct this by allowing designated PPRs to be tested before other projects. This would ensure that when retirements of existing resources reduce the capacity surplus to reasonable levels, PPRs would have the opportunity to enter the market. Conventional resources could still receive exemptions, but the amount of new entry by conventional resources would be reduced because the entry of PPRs would reduce investment signals for new entry.

Second, we propose to modify the BSM test assumptions regarding the timing of new entry to be consistent with the specific circumstances of the project. The current BSM process

was designed assuming every new entrant would be a gas-fired generator that would take three years to develop. However, this current class year includes projects with a wide range of development timeframes, including battery storage resources capable of entering in just a few months as well as HVDC transmission lines and offshore wind projects with much longer development timeframes. In the case of a battery storage project, the actual timing of entry is likely to be based on a combination of factors such as the permitting lead time, contractual incentives, when wholesale prices are likely to be most attractive, and forecasted reductions in battery purchase costs. Consequently, battery storage projects in the current class year might have a range of different plans with the potential for entering in 2020, 2021, 2022, or 2023, depending on individual circumstances.

Based on the locational capacity requirements that are anticipated for New York City beginning in May 2020,[14] we estimate that approximately 300 to 400 MW of BSM exemptions would become available for projects entering as early as 2020. However, the current BSM rules require the NYISO to assume that battery storage projects would not enter until May 2022. If the BSM rules were modified as we propose, it would be possible for the NYISO to grant exemptions to individual projects that would commence in a particular year. For example, some batteries would receive an exemption commencing in 2020 while others' exemption would commence in 2021 or 2022 according to the availability of exemptions in each year. Modifying the BSM test to correct this issue would reward first-movers that are capable of bringing resources online quickly while ensuring that the pace of new subsidized entry does not lead to large capacity surpluses.

[14] See October 3, 2019 presentation *Informational LCR Results* by Nathaniel Gilbraith to the ICAPWG.

This change would also facilitate entry of large subsidized resources with long (i.e., four to six year) lead times. For example, suppose a large project in the current class year sought to enter the market in 2025. Considering the anticipated timing of entry of the project would allow it to obtain exemptions that would be made available by generators expecting to retire because of the DEC's Peaker Rule. The current test assumes every unit in Class Year 2019 would enter in May 2022, so the retirements resulting from the Peaker Rule would not be considered in the current BSM test. Hence, a large subsidized project could receive a partial or total exemption in this class year that would be made available by peaking resources planning to retire in 2025, and the project would then be first in line to receive any exemptions made available by additional retirements. Together, these changes would evolve the BSM rules to facilitate entry of subsidized resources while maintaining a commitment to investors to support a competitive wholesale market.

We recommend the creation of a Public Policy Resource Evaluation and refinements to the assumptions related to the timing of entry of individual projects. These changes would recognize that the purpose of the BSM rules is not to impede the implementation of state policy goals, but to ensure the integrity of the NYISO's competitive wholesale markets. The markets will become increasingly important to the achievement of state policy goals as more public policy resources enter the market and rely on revenue streams that depend on efficient wholesale prices.

VI. CONCLUSIONS

The New York Public Service Commission ("the Commission") has raised fundamental questions regarding resource adequacy mechanism for the New York wholesale electricity market. These question the compatibility of competitive wholesale power markets with New York state's environmental policy objectives. However, the NYISO's competitive wholesale

markets should be an integral part of the overall solution to promote New York state's policy objectives in a manner that preserves reliability and is more cost-effective than state-directed contracting (like the mechanism used in California).

Section II of this filing demonstrates that the NYISO market is currently designed to provide incentives that will facilitate efficient investment decisions as the penetration of intermittent renewable generation increases. These investments will increase the supply of resources with flexible operating characteristics that will help integrate intermittent renewables.

Further, key enhancements to the energy, ancillary services, and capacity market will improve the ability of the market to efficiently facilitate actions to satisfy New York's public policy goals while minimizing the costs to New York's consumers. Section III of this filing outlines several enhancements to the NYISO's energy and ancillary services markets that will improve incentives for flexible supply-side and demand-side resources, encourage the retirement of older inflexible conventional generators, and improve the deliverability of intermittent renewable generation to load centers. Section IV identifies two potential enhancements to the capacity market that would ensure that older inflexible generation that has a diminished reliability value is not over-compensated for capacity. Adopting these two enhancements would encourage the retirement of existing low-value generators. Taken together, these changes will significantly improve the economics of public policy resources and encourage the transition away from less flexible resources.

The changes proposed to the energy and ancillary services markets will decrease the effects of the BSM rules on investments in renewable resources and storage resources. Nonetheless, Section V describes two key enhancements to the BSM rules that would further facilitate the entry of New York state policy resources, while ensuring the NYISO's basic commitment to competitive wholesale markets. This is important because well-functioning

wholesale markets will provide the needed system flexibility to integrate the public policy resources and continue to satisfy New York's reliability requirements at the lowest cost to New York's consumers. Therefore, we respectfully recommend that the State work collaboratively with the NYISO to develop and implement the market enhancements described in these comments.

Respectfully submitted,

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