

STATE OF NEW YORK PUBLIC SERVICE COMMISSION

Proceeding on Motion of the Commission to
Implement a Large-Scale Renewable Program
and a Clean Energy Standard

Case 15-E-0302

COMMENTS OF POTOMAC ECONOMICS, LTD.

Pursuant to the Notice of Comment Period for Staff White Paper and Cost Study issued by the New York Public Service Commission (“Commission”) on April 8, 2016, Potomac Economics respectfully submits its comments in the above-captioned proceeding concerning the study of benefits and costs (“Cost Study”) of the proposed Clean Energy Standard (“CES”) issued by the New York State Department of Public Service Staff (“DPS Staff”).¹ Potomac Economics respectfully requests that its comments be accepted into the record of this proceeding pursuant to the Commission’s public statement inviting comments during its pendency.²

In its White Paper, the DPS Staff outlined the goals of generating 50 percent of electricity consumed in New York by 2030 from renewable resources while maintaining the carbon savings from existing nuclear plants. We support the Commission’s objective of reducing carbon emissions from the electric utility sector in a cost-effective manner by improving investment incentives for cleaner generation. Markets can be powerful allies in achieving the maximum emission reductions at the lowest cost.

¹ See *Staff White Paper on Clean Energy Standard*, Issued January 25, 2016, Case 15-E-0302, In the Matter of the Implementation of a Large-Scale Renewable Program and a Clean Energy Standard.

² “Comments from the public will be accepted at any point while this proceeding is pending, but are requested by June 6, 2016 to ensure full consideration. All public comments will become part of the record considered by the Commission.” See New York State Public Service Commission, “Spotlight on: Clean Energy Standard, Fact Sheet for Utility Consumers.”

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.³ As the MMU, we are also responsible for reporting on “the use of the New York State Transmission System as such system affects or may affect competitive conditions in or the economic efficiency of any of the New York Electric Markets”.⁴ The proposed CES will have broad implications for all of the New York’s electricity markets.

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. Permitting Potomac Economics to intervene at this time will not prejudice any party in the proceeding as the Commission has not yet finalized the CES and the mechanisms for implementing it. Potomac Economics agrees to accept the record in this case as developed to date. For these reasons, Potomac Economics respectfully requests that the Commission grant this motion for leave to intervene out of time in this proceeding.

These comments discuss how the markets for both electricity and carbon can be enlisted to achieve the Commission’s CES objectives more rapidly and at lower cost than by relying primarily on a renewable energy mandate. We hope these comments will be helpful to the Commission as it develops its CES Order.

³ See NYISO’s Market Administration and Control Area Services Tariff (“Market Services Tariff” or “MST”) Attachment O §30.1.2.

⁴ See MST Attachment O §30.1.1.

I. BACKGROUND AND INTRODUCTION

The DPS Staff White Paper outlined the objectives of the proposed CES including the goal to generate 50 percent of electricity consumed in New York from renewable resources by 2030 while maintaining the zero-emissions electricity production from existing nuclear plants. The DPS Staff subsequently analyzed the costs and benefits of the proposed CES and issued the Cost Study on April 8, 2016 to inform the Commission as it considers the design of a cost-effective CES.

The Cost Study estimated the gross costs (the payments required to clean energy generation developers in addition to the developers' energy and capacity revenues), the net costs (gross costs net of the societal value of avoided carbon emissions), and the electricity bill impacts of all three tiers associated with the CES goals.⁹ The results of the Cost Study indicate that the impact of meeting the CES goals on electricity bills would be less than one percent and that the CES program would lead to a net benefit of \$1.8 billion by 2023.¹⁰

Ultimately, the Commission will consider a range of factors before issuing a final rule. These comments explain the value of utilizing markets to achieve the Commission's objectives. Additionally, the Commission's determination regarding the final CES rule should be informed by reasonably accurate and unbiased estimates of the associated costs. Hence, these comments also discuss some of the key assumptions underlying the CES program cost estimates presented in the Cost Study.

⁹ The CES targets are classified into three tiers – Tier 1 (targets for new renewable resources), Tier 2 (targets for maintaining existing renewable resources in New York) and Tier 3 (targets for maintaining existing nuclear facilities).

¹⁰ The estimated net benefits from Tier 1, Tier 2 and Tier 3 procurement are \$787 million, -\$258 million (cost), and \$1,316 million, respectively. Total gross program costs amount to \$1,271 million. Cost Study at P. 11.

II. THE VALUE OF MARKETS IN FACILITATING PUBLIC POLICY OBJECTIVES

Markets are powerful because they align the incentives of market participants with the market's objectives so participants will engage in cost-effective actions that contribute to satisfying the objectives. In many cases, the full array of possible actions are not known, but the market incentives can unleash participants' creativity and innovation in finding the most cost-effective actions possible.

Conversely, restricting these actions by designating a preference for one technology or strategy to the exclusion of others will likely reduce the effectiveness of the CES program and increase its costs.

To illustrate the value of adopting a technology-neutral, market-based strategy for reducing carbon emissions, in our 2015 New York ISO State of the Market report, we analyzed the costs of reducing carbon emissions by different means. In particular, we estimated the cost per-ton of reducing CO₂ emissions using several alternative investments.

This analysis is based on the revenues that various types of generators would have earned in the New York ISO electricity markets in excess of their operating costs. These "net revenues" provide the incentive to invest in new resources or incur the necessary fixed costs to keep existing generators in operation. Our estimated costs of reducing carbon emissions reflect the additional revenues in excess of each generators' net revenue from 2015 that would be necessary to build or maintain the low-emissions generator.

Based on wholesale electricity prices in 2015, we find that the costs of reducing carbon emission varies substantially by technology and location:

- Building a new combined-cycle unit on Long Island would cost \$20 per ton.¹¹
- Making payments to retaining existing nuclear capacity in western New York would cost \$20 to \$43 per ton.¹²
- Using onshore wind and utility-scale solar PV resources on Long Island would cost \$41 and \$115 per ton, respectively.¹³

The fact that the costs of reducing carbon emissions can vary widely by type of action or strategy indicates the value of utilizing a technology-neutral, market-based approach in pursuing carbon reductions in New York because markets provide strong incentives to pursue the most cost-effective solutions. To examples of technology-neutral, market-based solutions would be a carbon tax or a cap-and-trade carbon market, both of which would provide meaningful incentives for investors and other market participants to take actions to reduce carbon emissions. In addition to building cleaner new generation, market-based mechanisms would also provide incentives for participants to retire older, high-emitting generators. Ultimately, this would accelerate the emissions reductions and technological changes the Commission is seeking.

In fact, the Regional Greenhouse Gas Initiative (“RGGI”) is a successful cap-and-trade market that has been implemented in the region and could be modified to address New York’s Clean Power Plan goals. A number of other states that participate in RGGI have similar goals and, by working together, New York all can achieve its environmental objectives at lower costs to the region’s consumers.

¹¹ This assumes that the new combined cycle on Long Island would displace generation with an average carbon intensity of 0.65 tons per MWh. Cost varies based on revenues at different locations of the new generator.

¹² This assumes that a retiring nuclear unit in Zone B would lead to increased generation with an average carbon intensity 0.45 tons per MWh.

¹³ This assumes that the new renewable units on Long Island would displace generation with an average carbon intensity of 0.65 tons per MWh.

III. COMMENTS ON ASSUMPTIONS UNDERLYING THE COST STUDY

The methodology utilized by the DPS Staff to analyze the costs of the proposed CES relies on a number of key assumptions that we evaluate in this section.

A. Energy Price Forecasts

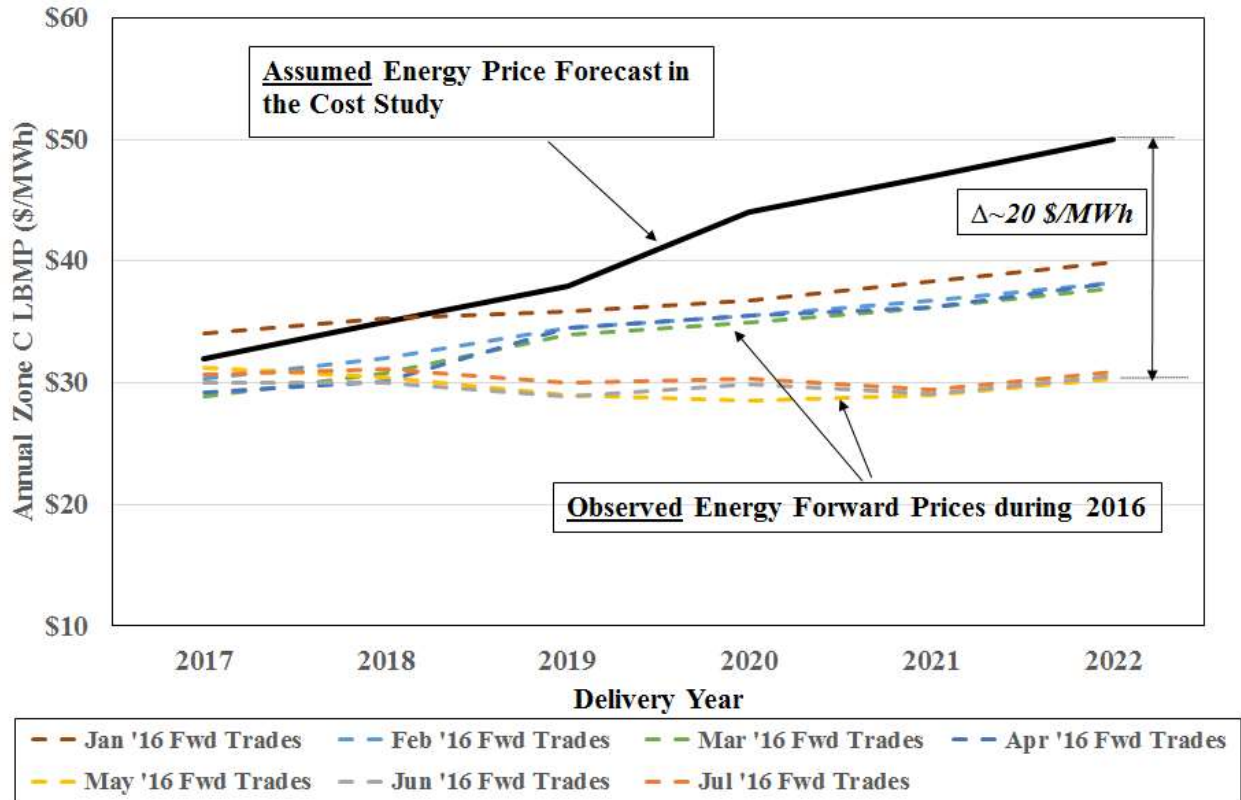
The energy prices assumed in the Cost Study are a key assumption because they determine the required above-market payments to producers of carbon-free electricity. In fact, the Cost Study itself provides sensitivity analyses indicating that a 10 percent reduction in the assumed energy price forecast would decrease the estimated net benefits from the Tier 1 and 2 programs by 94 percent.¹⁴

The DPS Staff based its energy price forecast on modeling results produced by the NYISO in the 2015 Congestion Assessment and Resource Integration Study (“CARIS”).¹⁵ However, the DPS Staff’s use of CARIS does not consider up-to-date assumptions regarding factors that would drive the energy market prices once the CES is implemented. As a result, the energy price forecast is biased upwards, leading to an under-estimate of the subsidies necessary to support the CES program objectives. To place in context the energy price forecast used in the Cost Study, we compared the forecast prices to recent information on the pricing of electricity forward contracts for delivery between 2017 and 2022. (See Figure 1.) This figure shows that since the beginning of 2016, the observed forward market prices for electricity to be delivered in 2022 are 20 to 40 percent (i.e. \$10 to \$20 per MWh) lower than assumed in the Cost Study for energy in Zone C (a trading hub in upstate New York). This data indicates that it would be valuable for the Commission to consider updating its assumed energy price forecast.

¹⁴ Cost Study at P. 48, 90, 91.

¹⁵ The DPS Staff adjusted the 2015 CARIS energy price forecast through 2024 and inflated the prices thereafter using the weighted average of natural gas prices and inflation from the Department of Energy Annual Energy Outlook, 2015. *Id.* at P. 215.

Figure 1: Zone C Forward Market Energy Prices Compared to the Cost Study Energy Price Forecast¹⁶



B. Effects on Energy and Capacity Values from High-Penetration Renewable Resource Scenarios

The renewable energy targets of the proposed CES would be satisfied primarily by intermittent renewable resources. It is commonly recognized that the value of energy produced by intermittent renewable resources tends to fall as the amount of a particular type is increased in a particular area. However, the Cost Study does not consider this factor in its cost estimates, which tends to bias the estimates of the necessary subsidies downward.

The energy market value of an intermittent renewable project is dependent on the prices over the hours during which the resource is expected to produce energy. As additional capacity

¹⁶ The graph showing the Cost Study’s energy price forecast is a visual approximation of the chart presented by the DPS Staff in the Cost Study. See *Id.* at P. 44.

of a particular resource type is integrated, its production will be concentrated over a subset of the hours in a day. Consequently, the production-weighted energy prices received by the renewable resources will decline as renewable penetration increases.

Similarly, the value of capacity provided by renewable resources also decreases as an increasing amount of the same resource is added to the grid. However, the Cost Study assumes a fixed capacity value for intermittent renewable projects through the end of the plant life, and it does not consider the reduction in capacity revenues even as large quantities of wind and solar generation are added to the system. Consequently, the Cost Study likely under-estimates the subsidies that will be necessary to support resources under the CES.

C. Costs Associated with Integrating Large Quantities of Intermittent Renewables

The Cost Study evaluates large additions of intermittent wind and solar resources, but it does not consider any potential grid integration costs, which is contrary to the experience of other regions.¹⁸ The increased variability in generation may require increased amounts of fast-ramping resources and ancillary services such as regulation and voltage support. Several studies and regulatory proceedings in other jurisdictions have estimated these costs, which must be paid for by system users. For instance, as part of a 2014 decision in a proceeding related to the Renewable Portfolio Standards, the California Public Utilities Commission adopted interim cost adders of \$3 for each MWh from wind and \$4 per MWh of solar to account for the increase in the grid operating costs under high renewable scenarios.¹⁹

¹⁸ The Cost Study includes the integration costs to the extent they are borne by the developer (e.g. ERIS and CRIS costs). However, the aforementioned costs of integrating renewables at a large scale are not included in the analysis. See *Cost Study*, P. 28, 251-257.

¹⁹ These adders were proposed by PG&E based on a survey of studies from other jurisdictions. See page 62 of CPUC decision D.14-11-042, available at <http://docs.cpuc.ca.gov/PublishedDocs/Published/G000/M143/K313/143313500.PDF>

In addition, transmission constraints around potential renewable generation sites could require substantial investment in transmission facilities to deliver renewable energy to load centers in New York. The vast majority of the proposed utility-scale renewable projects in the NYISO's interconnection queue are situated in upstate New York.²⁰ However, the Cost Study does not include estimates for the costs of new transmission that may be needed to move power to the load centers downstate. Therefore, the Cost Study would be more accurate if it estimated these costs and included them in the calculation of Tier 1 net benefits.

IV. CONCLUSIONS

We understand and support the Commission's objectives to cost-effectively reduce carbon emissions in New York. These comments are intended to provide helpful advice on the development of a Clean Energy Standard that will be as effective and efficient as possible. To this end, we have discussed the value of utilizing markets and the incentives they produce to facilitate actions to achieve these public policy objectives.

Additionally, we commented on key assumptions in the CES Cost Study that could be modified to improve the accuracy of the forecasted benefits. The DPS Staff in conjunction with the NYISO and several other entities has embarked on a State Resource Planning study ("SRP Study").²¹ The SRP Study will model the impacts of various public policies on the New York

The efforts to develop final values for renewable integration cost adders under various RPS scenarios are underway.

²⁰ See *The NYISO Planning Interconnection Queue* at http://www.nyiso.com/public/webdocs/markets_operations/services/planning/Documents_and_Resources/Interconnection_Studies/NYISO_Interconnection_Queue/NYISO%20Interconnection%20Queue.xls

²¹ See presentation on *New York State Resource Planning Analysis* to NYISO Management Committee on January 27, 2016 by Leka Gjonaj – New York State Department of Public Service, available at http://www.nyiso.com/public/webdocs/markets_operations/committees/mc/meeting_materials/2016-01-27/Agenda%2004_NYSDPS%20SRP%20Presentation.pdf

electricity system (including impacts under multiple low-carbon scenarios). This process could provide information useful for improving the assumptions and forecasts in the CES Cost Study.

WHEREFORE, for the foregoing reasons, Potomac Economics, Ltd. respectfully requests the Commission to grant its motion to intervene in this proceeding and consider these comments.

Respectfully submitted,

/s/ David B. Patton

David Patton, President
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