

**STATE OF NEW YORK
PUBLIC SERVICE COMMISSION**

**In the Matter of Carbon Pricing in New York
Wholesale Markets**

Matter 17-01821

**NUCOR STEEL AUBURN, INC.
COMMENTS ON THE BRATTLE GROUP REPORT AND SUGGESTED
ANALYSES TO BE INCORPORATED IN THE INTEGRATING PUBLIC POLICY
TASK FORCE WORKPLAN**

Dated: November 30, 2017

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I. Introduction

On August 16, 2017, New York Independent System Operator (“NYISO”) President Brad Jones and Public Service Commission (“PSC or “Commission”) Chairman John Rhodes released a report by the Brattle Group (“Brattle”) entitled *Pricing Carbon into New York’s Wholesale Energy Market to Support New York’s Decarbonization Goals* (“Brattle Report” or “Report”).

At the September 6, 2017 NYISO-PSC joint technical conference on the Brattle Report, NYISO and PSC representatives noted the preliminary nature of the carbon pricing study and observed that the examination of carbon pricing was very much a “work in progress.” Subsequently, NYISO announced the formation of an Integrating Public Policy Task Force (“IPPTF”) to assess carbon pricing issues and alternatives. On October 19, 2017, the Department of Public Service (“Department” or “DPS”) issued a *Notice on Process, Soliciting Proposals and Comments, and Announcing Technical Conference* (“Notice”) in new DPS Matter 17-01821 to assess carbon pricing issues. In the Notice, the Department sought “input on the concepts for harmonizing New York State policy and New York wholesale electricity markets,” indicated an intent to coordinate efforts with NYISO, invited feedback on the Brattle Report, asked for suggestions regarding the going forward process to pursue and analytical issues that should be

examined, sought panelists for planned future technical conferences, and encouraged the submission of alternative proposals for consideration by November 30, 2017. Nucor Steel Auburn, Inc. (“Nucor”) submits these comments to the Brattle Report and also suggests numerous areas in which additional analysis should be undertaken.

At this time, Nucor does not offer specific policy or pricing alternatives that should be explored because it is premature to do so until further study is performed. We note, however, that any policy alternatives that are considered must: 1) further the overall economy-wide carbon emission reduction goals, 2) avoid impeding compliance with electric system reliability criteria, 3) acknowledge that carbon emission reductions are fungible across all sectors and locations, and 4) recognize that carbon emission reductions achieved through demand destruction (manufacturing losses and relocations to other states or countries that employ higher emitting processes or rely on higher emitting generation resources) are counterproductive from both economic and greenhouse gas (“GHG”) reduction perspectives and are a “lose-lose” proposition to be avoided.

II. Brief Synopsis of the Brattle Group Report

Brattle states that their study has the two-fold purpose of: 1) assessing market design options for carbon pricing, and 2) estimating how carbon pricing would affect market outcomes.¹ The Report expressly assumes that a new carbon charge added to wholesale energy prices would supplement, rather than replace, New York’s Clean Energy Standard (“CES”), its participation in the Regional Greenhouse Gas initiative (“RGGI”), and other clean energy initiatives, and opines that carbon-price-induced emission reductions beyond the levels achieved by those State and

¹ Report at vi.

regional initiatives “could help New York meet its economy-wide decarbonization goals at a lower cost to consumers....”²

The Brattle Report looks at carbon pricing implementation questions, but does not examine whether an extra carbon price adder to wholesale energy prices is a lower cost carbon abatement approach to other possibilities that New York, NYISO or the PSC should consider (including a no-action alternative, which is a core question). Although several possible carbon pricing strategies are mentioned, the only policy option that Brattle assesses to “harmonize” NYISO-administered power markets and state-managed clean energy programs is a substantial carbon charge added to wholesale energy prices applied state-wide.³

In brief, based on a “snapshot” look at the year 2025, Brattle concludes that it is feasible to include a new and significantly greater carbon price adder to wholesale energy prices than is currently reflected in energy prices through RGGI auctions. Brattle suggests that it might be possible to offset most of the expected \$3 billion annual additional electric energy cost to the New York economy caused by such an adder if carbon charges effectively assessed to fossil-fired generators (*i.e.*, carbon cost deductions from energy locational based marginal prices (“LBMPs”)) were refunded or credited to customers in the same manner that customers paid the carbon adder in the first instance (volumetrically) and if a series of other “static” and “dynamic” energy cost offsets actually were to occur.⁴

² *Id.* at vii. See Case 15-E-0302, Proceeding on Motion of the Commission to Implement a Large-Scale Renewable Program and a Clean Energy Standard, *Order Adopting a Clean Energy Standard*, issued August 1, 2016 (“CES Order”).

³ Report at v.

⁴ Using forecasted electric energy use in 2025 according to the 2017 NYISO “Load and Capacity Report” (“2017 Goldbook”), see Table I-1 (energy and demand forecasts), and multiplying the expected energy price increase of roughly \$19/MWh calculated by Brattle by that estimated usage produces an expected statewide cost of approximately \$3 billion in 2025.

With respect to the estimated emission reduction benefits of an incremental carbon charge, the Brattle Report calculates that the postulated adder might create up to 2.6 million tons of incremental CO₂ reductions annually.⁵ Almost half of the estimated emissions reductions (1.2 million tons per year), however, were not related to the electric supply sector, but were tied instead to the expected loss of large customer loads driven by higher energy prices that the Report assumes would not be mitigated after all.⁶ The Report does not attempt to reconcile the inconsistency between its heavily mitigated consumer cost estimate and the substantial loss of large customer load that drives the estimated carbon abatement attributed to the adder. This highlights both an important flaw in Brattle’s conceptual analysis and the critical need to realistically appraise and balance all aspects of such public policy proposals.

To conduct its “high level” assessment, Brattle employed numerous simplifying assumptions that would need to be tested if this approach were to be pursued. Chief among these was a decision to base the incremental carbon charge upon the \$58/ton Social Cost of Carbon (“SCC”) adopted in the Commission’s CES Order (less a fixed RGGI carbon price of roughly \$17/ton).⁷ The actual level of the added carbon charge to be imposed, how the charge would be determined, whether NYISO or the PSC should set and adjust the level of that charge, the estimated cost of the charge to New Yorkers and associated economic impacts, carbon fund refund implementation and allocation issues, the reasonableness of the presumed “static” and “dynamic” offsets to that cost, border issues, economic and emissions “leakage” questions, and overlap, duplication and potential tension with state-directed programs and RGGI are among the many

⁵ Report at 30.

⁶ *Id.* at 36.

⁷ *Id.* at ix.

matters that would need to be fully vetted by NYISO, its stakeholders, and possibly the Department prior to development of a proposal for implementation.

III. Executive Summary

“Harmonizing” state energy prerogatives, wholesale power market practices administered by NYISO, customer cost and economic considerations that remain the Commission’s responsibility under the Public Service Law, and New York’s economy-wide carbon reduction goals require a hard look at system needs (transmission, distribution, generation reserves and capabilities, etc.), important regional and economic considerations, emerging trends, and the ultimately limited pool of ratepayer dollars that can be appropriated for regulated public policy purposes. The Brattle Report generally asserts that an additional carbon price adder to wholesale energy prices is the presumptive solution that would align NYISO market rules with New York state carbon reduction objectives. This is an incomplete framing of that complex set of issues. As a result, the Problem Statement articulated by Brattle confuses duplicating state-directed clean energy incentives with a wholesale carbon market price adder, at a very substantial cost to New York consumers, for a coherent plan in which NYISO and State actions are complementary rather than potentially antagonistic.

At a policy level of review, the electric supply sector has already achieved the New York 40% carbon emission reduction target. The CES renewable energy credit (“REC”) and zero emission credit (“ZEC”) programs that are designed to achieve New York’s renewable (50% by 2030) and nuclear generation retention goals are being implemented and do not require a supplemental carbon charge to provide duplicative recovery of an estimated social cost of carbon. The Brattle Report acknowledges this, but asserts, without supporting analysis, that a carbon charge to induce over-compliance in the electric supply sector would be more cost-effective than

undefined “other ways”⁸ to further New York’s economy-wide carbon reduction goals.⁹ This claim is a monumental leap with no tangible support that seems directly at odds with the acknowledged need to promote electrification in transportation and other sectors. Convergence of energy, transportation, and air emissions policies around electric vehicle (“EV”) deployment, EV charging and infrastructure, and energy storage are emerging trends with respect to economy-wide carbon reductions, and simply raising electricity prices, and only New York electricity prices, through another carbon charge will only discourage EV deployment in the State.

If the objective is defined as furthering New York’s overall decarbonization goals, but the scope of the analysis is inappropriately confined to the electric supply sector, the most immediate questions concerning the imposition of an additional carbon charge to wholesale energy prices are 1) whether a market-based approach to carbon pricing should supplant the current state-directed initiatives and payment guarantees, 2) whether the carbon cost impact on wholesale energy prices reflected in RGGI auctions should be considered sufficient, and 3) whether the suggested new carbon charge would materially improve the dispatch of the existing generation fleet from a carbon emissions perspective without compromising reliability. The Brattle Report does not assess these foundational questions, which seem to be beyond the consultant’s scope of work, but NYISO stakeholders, the Department and the IPPTF must confront them before advancing any further.

A. Question 1: whether a market-based approach to carbon pricing should supplant the current state-directed initiatives and payment guarantees

New York has relied on market forces for twenty years to direct the nature, timing and location of generation resources. Shifting from state-directed initiatives like the CES to market-driven signals to promote carbon abatement objectives could be more cost-effective in the long

⁸ *Id.* at vi.

⁹ *Id.* at iv-vii.

term, but would create transitional issues as the market price adder would overlap with carbon cost payments already built into long term contractual commitments provided to renewable projects and the Upstate nuclear plants through RECs and ZECs.

Of course, Brattle did not study the imposition of a New York-only carbon charge as a market-based replacement of the CES or RGGI, but added a supplemental carbon charge based on the social cost of carbon to those on-going initiatives. Because wholesale and retail costs are stacked on customer bills, the effects are cumulative, and an assessment is needed of the incremental value a new wholesale carbon surcharge can realistically secure compared to the duplication, inefficiencies and confusion that it would sow. A supplemental carbon charge certainly would create the same duplicative recovery of carbon costs with long term REC and ZEC contract commitments, and it would also extend windfall revenues going forward as well. Ensuring that New York ratepayers are not assessed the social cost of carbon more than once (whatever that value may be) is a crucial issue.

B. Question 2: whether the carbon cost impact on wholesale energy prices reflected in RGGI auctions should be considered sufficient

The Brattle Report is dismissive of the carbon price reflected in wholesale energy prices today as a result of RGGI auctions, although it notes that lowering the RGGI targets, which would increase prices (and which is under active consideration today), is an alternative strategy.¹⁰ Bypassing RGGI would create or magnify the border and leakage issues that the Report discusses at length. As the Report accurately observes, a New York-only carbon surcharge could make New York less economically competitive while carbon emissions simply shift to other RGGI states (*i.e.*, producing no net carbon abatement gains while New York experiences higher costs). As a starting point, the IPPTF should assess the proposed changes in RGGI targets, the beneficial effects of the

¹⁰ *Id.* at v.

recently announced plans for Virginia and New Jersey to join RGGI, and other RGGI-related matters before pursuing a “go it alone,” single-state, increased carbon charge applied only to electric prices.

C. Question 3: whether the suggested new carbon charge would materially improve the dispatch of the existing generation fleet from a carbon emissions perspective without compromising reliability

With load growth virtually flat in New York and thousands of megawatts of renewable generation capacity being added through the CES, imposing an incremental carbon charge to energy prices appears a pointless burden to the economy if it will not induce material carbon emission reductions through unit dispatch and commitment of the generation fleet. Brattle expresses hope that this might occur, but did not study that core question.

A brief look at New York’s electric supply fuel mix and generation today immediately reveals that 88% of the energy generated Upstate today is GHG emissions-free, and this percentage will rise as the CES is implemented. The opportunity to displace substantial amounts of carbon emissions from electric generation in this region through a new carbon charge adder just does not exist. The imposition of a supplemental carbon charge will provide significant increased revenues to incumbent clean energy generators, including in particular Exelon (for nuclear production now covered by ZECs) and the New York Power Authority (“NYPA”) (for conventional large hydro) without providing any identifiable incremental carbon abatement benefits.¹¹

Downstate offers a completely different picture but with a similar outcome. With the planned retirement of the Indian Point nuclear units, generation in the NYC metropolitan area will be almost exclusively fossil-fired (natural gas or dual-fueled units primarily burning gas), and load pocket and reliability considerations will continue to compel reliance on that local generation to

¹¹ A point that Brattle effectively concedes. *See* Report at 57-58.

follow load. A carbon price adder that increases energy prices but does not materially improve fossil generation dispatch in terms of carbon emissions will fail in its essential task.

In sum, based on the information provided in the Report, and which is discussed in greater detail below, the probable outcome of the suggested supplemental carbon charge layered above the existing state programs and RGGI will be a very expensive measure that would be ineffectual in terms of fostering carbon abatement in the electric supply sector, discourage needed electrification in other sectors, damage energy-intensive manufacturing in New York, provide windfall revenues to electric suppliers with no corresponding emissions reduction benefits, and would not remedy the market price formation, transmission congestion and related issues facing NYISO market participants today. Nucor recommends that the Department work with NYISO stakeholders to perform the needed foundational assessments required to realistically appraise all options before pursuing a counter-productive carbon charge added to wholesale energy prices.

IV. Important Background: Existing Generation, Load Following, Locational Considerations and Electrification in Transportation

New York State has an ambitious policy to reduce GHG emissions economy-wide 40% by the year 2030 (from 1990 levels). The transportation sector is the largest source of such emissions,¹² and, with the emerging convergence of the electric and transportation sectors through electric vehicles, the greatest source of potential carbon abatement savings available is through the substitution of electric vehicles for internal combustion engines.¹³ Residential fossil applications (primarily space heating) are next in terms of CO₂ tons and share, followed by the electric supply

¹² See Energy Information Administration (“EIA”), *2014 State Energy-Related Carbon Dioxide Emission by Sector*.

¹³ See the October 26, 2017 Alliance to Save Energy announcement of automotive industry commission (co-chaired by National Grid and Audi of America) to reduce energy use in the transportation sector at: <http://www.ase.org/50x50transportation>.

sector, commercial uses, and finally the industrial sector,¹⁴ with the latter showing declining emissions as manufacturing in New York continues to erode.

The Brattle Report notes that New York Power Plant CO₂ emissions have dropped by 41% since 2000,¹⁵ which means that the electric sector has already achieved the carbon reduction objective, but that is simply the beginning of the story. According to the 2017 Goldbook, roughly 52% of New York generation state-wide is produced by hydro (19%), nuclear (30%), and a comparatively much smaller amount of wind (3.0%), but virtually all of that clean generation is located Upstate (88% of Upstate generation has no carbon emissions). Conversely, with the planned retirement of the Indian Point nuclear units, more than 90% of power generation required to serve Downstate zones will be fossil-fired (predominantly natural gas or dual-fueled units primarily burning gas).

The dramatic differences between Upstate and Downstate generation profiles and GHG emissions is repeatedly emphasized in NYISO's recently released *Power Trends 2017* Report:

The emerging story of the New York electric system is a tale of two grids—a tale of clean energy abundance and surplus generating capacity upstate and fossil fuel dependence and high demand downstate. Limited transfer capability from upstate to downstate means that this tale of two grids is also a tale of two markets....¹⁶

Placing this distinction in closer perspective, according to the Environmental Protection Agency (“EPA”), Upstate New York has the lowest CO₂ emissions rate of any NERC sub-region in the

¹⁴ See EIA, *2014 State Energy-Related Carbon Dioxide Emission by Sector*.

¹⁵ Retirement of essentially all coal-fired units, replacement of that generation principally with gas-fired combined cycle units, increased efficiency in combined cycle facilities, and increasing amounts of wind power generation have all contributed to a dramatic reduction in power plant emissions. The Report notes the expected retirement of the two operating Indian Point nuclear units as well as the stagnant energy and peak load growth forecasted by NYISO in the 2017 Goldbook. In all other respects, the study did not account for any changes to the dispatch of the existing generation fleet. Report at vi-viii.

¹⁶ *Power Trends, New York's Evolving Electric Grid 2017*, at 8 (“Power Trends”).

United States.¹⁷ Given the preponderance of carbon-free generation, even when gas-fired units are on the margin, most of the energy generated in these zones has no carbon emissions, and the disparity between marginal and average emission rates will be significant. In this circumstance, carbon charge revenues will flow to existing generation but are not expected to induce any material carbon reduction benefits.

From an operational perspective, Upstate faces growing concerns regarding economic curtailment of wind resources, insufficient transmission capability to deliver wind generated energy to load, and an increase of more than 1000% in negative LBMP hours across all Upstate NYISO zones since 2012.¹⁸ With the State's CES program expecting nearly 5,000 MW of additional land based wind ("LBW") by 2025 (most of which is expected to be located Upstate), these problems will only be exacerbated.¹⁹

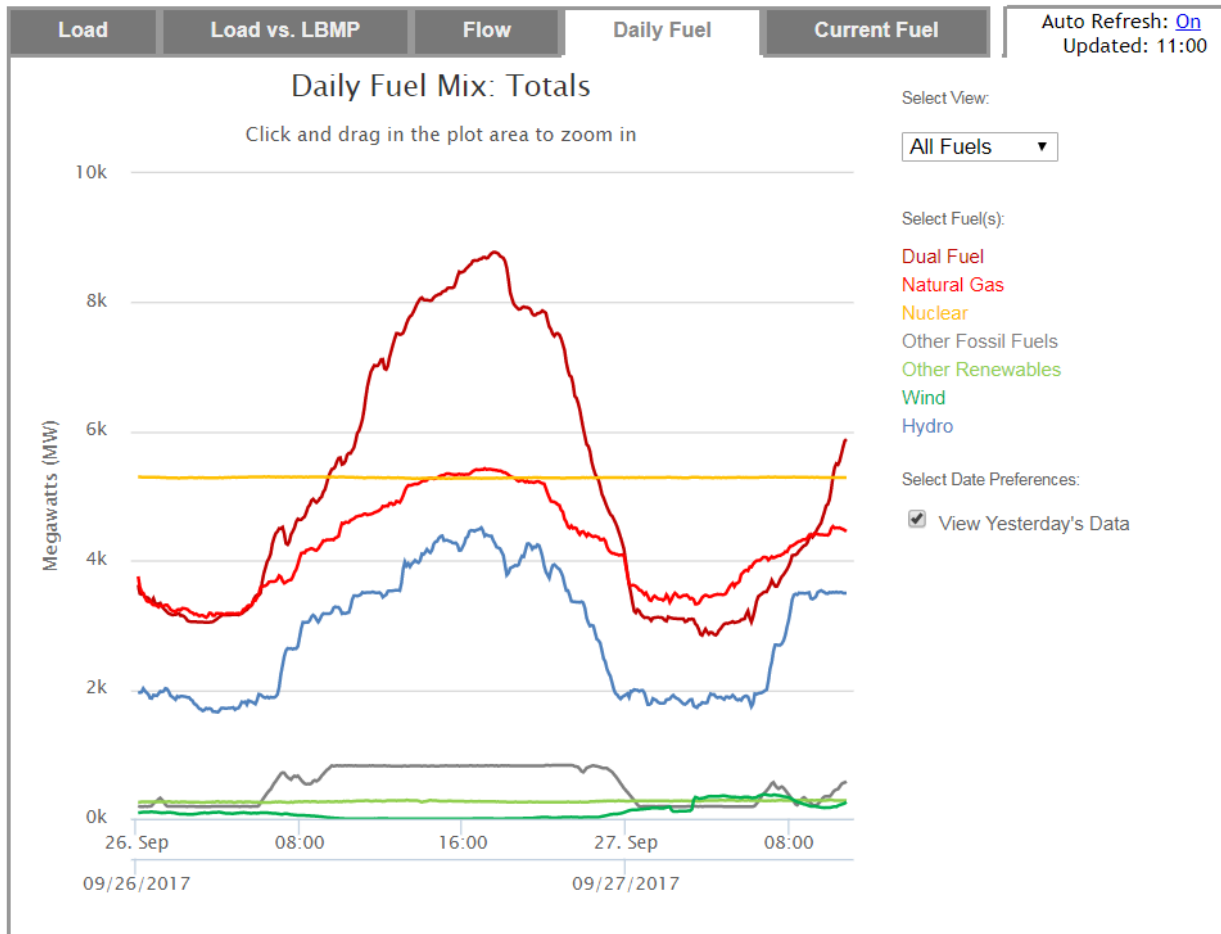
Thus, GHG emissions produced by the State's electric sector is not really about total annual megawatt hours of energy produced statewide. Rather, the decisive considerations in the tons of carbon emitted from that sector concern where, when, and how much fossil-fired generation must be dispatched based on regional load shapes, peak demands and reliability needs. As shown below on the NYISO fuel mix chart for September 26, 2017, a comparatively warm day in the early Fall, dispatch of gas and dual-fueled generation rose significantly mid-day to serve peak demand on the system. Nuclear generation was constant, and hydro electric generation exhibited a routine daily pattern as 1,400 MW of Blenheim-Gilboa pumped storage production dropped in the evening and

¹⁷ See eGRID2014 v.2 Summary Tables (February 27, 2017), at https://www.epa.gov/sites/production/files/2017-02/documents/egrid2014_summarytables_v2.pdf, Table 1.

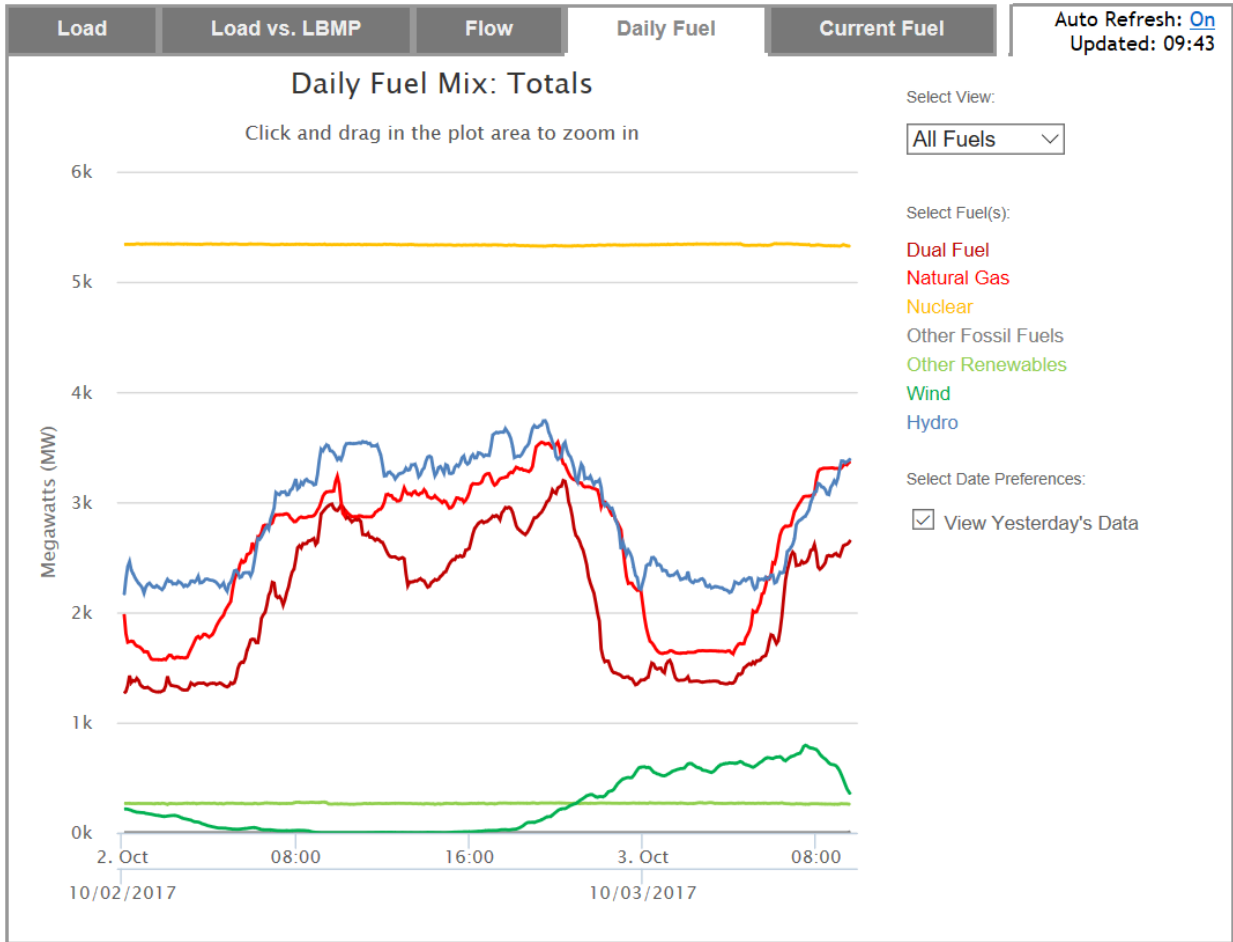
¹⁸ See NYISO, NY Wind-Overview and 2016 Operation (October 16, 2017) http://www.nyiso.com/public/webdocs/markets_operations/committees/bic_miwg/meeting_materials/2017-10-16/NY%20Wind-Overview%20and%202016%20Operation.pdf. In the Downstate zones, negative pricing in 2016 occurred in an infinitesimally small 0.3% of total hours in the year and fossil-fired generation must always be dispatched to chase load.

¹⁹ See Power Trends at 25 Fig. 20.

resumed the next morning. For load following and reliability purposes, as peak demand increased, the depth of fossil fueled generation increased and more inefficient units were dispatched.



One week later, on October 2, 2017, cooler temperatures allowed for a far greater reliance on existing clean resources and less dispatch of the fossil units because peak demands were lower.



On this day, nuclear generation remained constant, hydro generation exhibited the familiar daily production pattern and substantially less fossil generation was dispatched to chase peak demand. Notably, as system load dropped in the evening, wind generation began increasing from barely 2 MW to more than 600 MW, which means that most of the wind production missed the peak demand when the highest emitting fossil units would be dispatched, and some conventional hydro may have been dispatched down.

These snapshots of the State’s generation fuel mix are indicative of the importance of a substantive assessment of New York resources and system needs from a carbon emissions perspective as a predicate to any NYISO public policy-based wholesale pricing changes. The depth and duration of fossil-fired generation dispatched in the NYC metropolitan area, particularly

during peak periods, seem to be the only factors that will really move the needle concerning carbon emissions in the electric sector, and this circumstance will be adversely influenced if EV charging occurs during peak periods. A supplemental carbon charge would not appear to have any effect on the production or dispatch of Upstate nuclear, hydro or wind resources, and none of those resources require the additional revenues that a carbon charge would supply. Further, as long as the dispatch of the fossil-fired units in the metropolitan area is required to chase peak demands and ensure reliability, all infra-marginal units would see increased revenues, but generation-related carbon emissions would not meaningfully change.

V. Feedback on the Brattle Report

Nucor’s specific comments on the Brattle Report generally follow the topical headings in the Report.

A. Executive Summary [Pages iv–xi]

1. Context [Pages iv-v]

Starting with New York’s economy-wide carbon reduction goal, Brattle takes note of the State’s electricity-oriented clean energy policies undertaken through REV, the Clean Energy Standard (RECs and ZECs) and RGGI, but rushes to the conclusions that further emissions reductions in the electric supply sector should be pursued to achieve the economy-wide goals, and that adding an SCC-based factor to wholesale energy prices (when the SCC is already incorporated in RECs, ZECs and the distributed energy resources “Value Stack”) is the optimal way to achieve that economy-wide goal. Briefly stated, exploring a single pricing alternative to a broadly framed issue will not provide a robust assessment of reasonable alternatives. A range of feasible alternatives, including a no-action option, should be examined.

2. Problem Statement [Pages v-vi]

The problem statement recited in the Brattle Report is limited to the assertion that wholesale electricity markets operated by NYISO are not aligned with the state's overall decarbonization objective because the carbon price currently reflected in electric energy prices through RGGI auctions is not big enough "to support New York's objectives" (meaning the 40% economy-wide carbon reduction goal).²⁰ The issues NYISO, the PSC, and the IPPTF must address clearly are much more complex than this problem statement; there are quite distinct Upstate and Downstate concerns, and many potential constructive solutions may not reside with NYISO at all.

Stated in terms of challenges, the concerns associated with new Upstate renewable resources (if they can be sited) primarily involve transmission constraints that increasingly are causing wind output to be "bottled up" (unable to be delivered to load) and related increases in curtailed wind output and negative energy pricing. There also are questions relating to intermittent generation performance, forecast error associated with that performance, and the potential need for fast starting resources (which likely would be fossil-fired) to "firm up" that generation. The challenges Downstate revolve around the absolute necessity of dispatching In-City fossil-fired generation to follow load. A supplemental carbon price adder does not look to resolve those basic issues.

Harmonized NYISO and PSC policies should look to better move CES-supported clean generation to load centers, and improving transmission capacity in certain zones is in fact under consideration in several venues for precisely that reason.²¹ It also continues to be important to

²⁰ Report at v.

²¹ See *2012 New York Energy Highway Blueprint Update* (April 2013), at <http://www.nyenergyhighway.com/PDFs/BP2013/EHBPuploadpt2013/FEF691503A543974958989EE032E461B/Blueprint Update2013.Web 9.1 5.8.13.pdf>; Case 14-E-0454, In the Matter of New York Independent System Operator's Proposed Public Policy for Transmission Needs for Consideration, Commission orders dated July 20, 2015, December 17, 2015, October 13, 2016 (western NY), and January 24, 2017. See also NYPA's proposal to rebuild its existing Moses to Adirondack 230 kV line to operate at 345 kV.

retain and attract high load factor manufacturing facilities Upstate that can best utilize clean energy generated during low load periods. Actions in this area also must avoid undercutting established state economic development policies enacted to help preserve such competitively at-risk loads.

Nucor recognizes that FERC is struggling with market price formation issues associated with state-subsidized energy projects that undercut competitive wholesale power markets, but that is a market structure concern and not a carbon reduction issue. Market price formation issues remain a topic of debate at NYISO, other organized wholesale power markets, and FERC. All market price formation questions and concerns should be developed through the normal stakeholder process beginning with the Market Issues Working Group of the Business Issues Committee at the NYISO. The IPPTF should not undertake a parallel discussion of those matters in the guise of environmental public policy.

Next, with increased electrification in the transportation and residential sectors being critical to achieving carbon reduction goals, officials in several states are assessing regulatory issues that are directly relevant to a convergence of transportation and electricity.²² EV deployment, charging station infrastructure, and EV charging contribution to electric system peak demand are rapidly developing issues. The Commission, and not the IPPTF, should develop a comprehensive assessment of electric rate design, pricing, and other convergence issues. Simply raising energy prices through a supplemental carbon charge would tend to discourage this electrification trend (by making the switch to EVs more expensive for consumers). Brattle

²² See, e.g., Michigan Pub. Serv. Comm'n Case No. U-18368, *Order and Notice of Opportunity to Comment*, dated October 25, 2017 (inviting comment on rate issues affecting plug-in electric vehicles and utility ownership of EV charging stations).

acknowledges that such a disincentive to electrification is a concern, and it should be closely assessed by the Department.²³

In sum, New York expects to continue its pursuit of renewable and distributed resources through the CES, the Clean Energy Fund, utility investments in distributed system platforms to optimize distributed energy resources (“DER”) system benefits, and Value of DER dockets for the foreseeable future. Examining only the limited expected effects on the electric generation supply sector of a carbon pricing adder to wholesale energy prices will not yield a coherent state energy and carbon reduction strategy or capture emerging trends.

Based on the current state of New York’s electric sector and emerging trends, the Problem Statement should be restated to read:

Which State and NYISO practices will most effectively and reliably utilize clean generation produced Upstate and accommodate load growth, including increased electrification in the transportation sector, while easing reliance on higher emitting fossil-fired generation that is required to serve load?

Nucor also supports the revised statement of the mission of IPPTF submitted by numerous end user and public sector stakeholders to read as follows:

The mission of the IPPTF is to establish an open and transparent forum for market participants, other stakeholders, members of the public, the NYISO, the New York State Department of Public Service (DPS), and the New York State Energy Research and Development Authority (NYSERDA) to explore and analyze, without presumption, sustainable policies, actions, market structures, and approaches (including but not limited to forms of carbon pricing) that, if implemented, would better align state policies and wholesale power markets in an economic and efficient manner.

The initial tasks of stakeholders and the IPPTF should be to perform the analyses required to establish a factual baseline with which to evaluate all proposed alternatives.

²³ The Report states that “The downside to this approach [a carbon surcharge to energy prices] is that it might discourage electrification from other sectors that do not face carbon pricing.” Report at 36.

B. Section III – Lessons Learned from Other Jurisdictions [Pages 9-18]

The Report describes efforts in other jurisdictions (Ontario, California, the United Kingdom, and New England) to establish an electricity carbon price adder or tax. Key lessons that Brattle derived from those programs include:

1. Section III.A – Ontario’s Deepening Decarbonization: Increasing levels of non-emitting resources may reach a point of diminishing returns in terms of carbon abatement while dramatically distorting market prices, particularly zero or negative pricing hours during low load periods [Pages 9-12]

This concern clearly applies to Upstate zones, where conventional hydro and wind energy production are already being dispatched down to accommodate non-dispatchable DER and new wind resources.²⁴ These concerns may be less applicable in fossil-dominated Downstate zones, but must be explored since they go directly to the expected efficacy of a carbon surcharge. Brattle does not assess the issue, but simply opines, without elaboration or study, that REC and ZEC holders may seek larger subsidies if market prices are depressed.²⁵ Such a response would not harmonize NYISO and PSC policies, but would merely add an unproductive burden on New York ratepayers.

2. Section III.B – California Cap-and-Trade Program: Unilaterally applied state carbon taxes create challenging leakage and border issues [Pages 12-15]

Brattle recognizes that a unilateral New York carbon charge adder could provoke a cost shift (to New York) and emissions shift (to other RGGI states). Whether a New York-only supplemental carbon charge layered above RGGI is needlessly complex and counter-productive compared to working through the RGGI process seems to be a fundamental issue for analysis.

²⁴ See *IPP Project Update & Next Steps*, presentation to the NYISO Business Issues Committee, dated November 15, 2017, at 11-12.

²⁵ Report at 12.

3. Section III.C – United Kingdom: A carbon price adder likely will lead to significant electricity price increases for energy-intensive, trade-exposed industries [Pages 15-17]

The Report acknowledges the risk of manufacturing demand destruction, but does not study it further, and merely asserts that Brattle lacked sufficient data to determine the extent to which large load loss occurred in the UK.²⁶ New York, however, has extensive data on its manufacturing sector, the chronic loss of energy-intensive manufacturing, the economic importance of such manufacturers to the Upstate economy, and the heavy influence that high electricity prices has had on that job loss. NYPA’s ReCharge NY power allocation program, enacted in 2011 under Governor Cuomo, expressly aims to arrest that long-standing decline.²⁷ A preliminary issue that the Department must assess is whether a supplemental electricity carbon charge would undermine the ReCharge NY and related economic development programs that look to help revitalize Upstate New York.

C. Section IV – Options for Pricing Carbon into NYISO’s Wholesale Energy Market [Pages 18-21]

Brattle notes three basic ways to price carbon in New York’s wholesale energy market: 1) the supplemental carbon charge that it evaluates in the Report, 2) a New York specific carbon cap-and-trade program (*i.e.*, like RGGI, but state-specific), and 3) tightening the RGGI targets to raise energy prices. Brattle dismisses the New York-only cap-and-trade approach as too administratively burdensome.²⁸ With respect to RGGI, Brattle simply observes, “[m]uch as this approach offers substantial economic efficiencies, we do not focus on it in this study since it is not aligned with New York’s current decarbonization goals and because substantially tightening the

²⁶ *Id.* at 17.

²⁷ Economic Development Law § 188-a, ReCharge NY power allocation program (2011) (allocating low-cost NYPA power in order to retain and attract competitively at-risk, energy-intensive and economically important loads).

²⁸ Report at 20.

caps would require much work with other states.”²⁹ Given the complexities caused by the overlap with RGGI, and the economic and emissions leakage risks of a single-state strategy, a basic question for the Department to assess is whether working through, rather than around, RGGI makes more sense.

It bears noting that in the CES docket, Case 15-E-0302, generation suppliers previously objected to ZEC payments to the existing nuclear units on the grounds that the payments would distort wholesale market prices, and argued that New York should continue to work through RGGI for carbon pricing.³⁰ The Commission’s CES Order rejected that claim without directly addressing the market distortion concerns, with the Commission finding essentially that New York did not have time to work with the other RGGI states given the impending retirement of certain nuclear plants.³¹ The Commission also found that lowering RGGI targets enough to increase wholesale prices to the level of the initial proposed ZEC price of \$17.48/MWh would cost New Yorker ratepayers approximately \$2.8 billion per year and would produce unacceptable customer bill impacts.³² As discussed below, the supplemental carbon charge that Brattle contemplates would produce precisely those unacceptable customer impacts unless the asserted carbon refund/credits and offsets are fully realized.

With the planned retirement of the Fitzpatrick nuclear plant pending in 2016, there were pressures during consideration of implementing the CES program to adopt a ZEC program apart from RGGI, but those time constraints do not apply here. The intent now is to establish coordinated and sustainable state and NYISO programs that will tap into the most cost-effective

²⁹ *Id.* at 21.

³⁰ Case 15-E-0302, Proceeding on Motion of the Commission to Implement a Large-Scale Renewable Program and a Clean Energy Standard, *Comments of Indicated Suppliers in Opposition to Staff’s Responsive Proposal for Preserving Zero-Emissions Attributes* (July 22, 2016), at 11-16.

³¹ CES Order at 132.

³² *Id.* at 133-34.

carbon abatement opportunities. Focusing on RGGI seems the logical starting point for pricing carbon in New York’s wholesale power markets, rather than by-passing that process. The case for a regionally coherent approach to carbon pricing has grown recently in light of announcements that Virginia and New Jersey intend to join RGGI. The task force should assess any new actions taken by RGGI prior to adopting any unilateral action.

D. Section V – Market Design Issues with a Carbon Charge [Pages 21-30]

1. Section V.A – Establishing the Appropriate Carbon Price and Adjustments Over Time [Pages 22-23]

Brattle’s assessment of a supplemental carbon charge adder to wholesale energy prices employs the U.S. Interagency Working Group social cost of carbon estimate, as employed by the Commission in its CES Order.³³ In October 2017, the EPA employed a drastically different domestic SCC estimate in its Regulatory Impact Analysis withdrawing the Clean Power Plan regulations.³⁴ For the purposes of this Matter, this raises basic questions, as Brattle notes, concerning how a supplemental carbon charge would be calculated, whether the Commission would set that price as a public policy determination or whether it would be calculated and updated using the established NYISO stakeholder processes.³⁵ How such a charge would be calculated and administered also directly affects the regulatory risks perceived by renewable project investors in relying on a carbon surcharge applied to energy prices. These are crucial preliminary questions to resolve. From Nucor’s perspective, if such an adder to wholesale energy prices were to be implemented as a change to NYISO’s tariffs, all computational and administrative aspects of the charge should originate and be decided through NYISO’s established processes.

³³ Report at 22.

³⁴ Regulatory Impact Analysis for the Review of the Clean Power Plan: Proposal (October 2017) https://www.epa.gov/sites/production/files/2017-10/documents/ria_proposed-cpp-repeal_2017-10.pdf.

³⁵ Report at 21-22.

2. Section V.B – Returning Charges to Customers [Page 23]

The deduction of a carbon charge in the NYISO settlement with generators and the return of the resulting carbon fund to customers as a refund, credit or energy price adjustment are core elements of Brattle’s contemplated administration of the carbon charge and mitigation of customer impacts. Brattle assumes a dollar-for-dollar refund of the carbon fund volumetrically to customers through load serving entities (“LSEs”) as the driving force in Brattle’s “surprising” conclusion that the customer cost impacts of a supplemental carbon surcharge would be minimal,³⁶ but Brattle contradictorily assumes that the State would eschew customer bill mitigation using a volumetric credit in order to produce incremental carbon abatement through large customer demand destruction.³⁷

There are numerous questions regarding both “carbon fund refund” paths described in the Brattle Report that need to be examined. For the “offset” path, the Department should assess estimated generator source contributions to the carbon fund, which will be highly variable by zone. The Department also needs to critically examine the reasonableness of Brattle’s estimates regarding the size of the fund and the Report’s projection that carbon fund refunds would offset nearly half of the carbon charge to end users, as well as how that fund would serve to offset customer bill impacts as renewable generation increases and the size of the fund accordingly shrinks. Administratively, there also are basic collection and billing questions that the Commission must resolve if it requires LSEs to refund amounts volumetrically. A volumetric refund or credit of the carbon charge certainly is necessary to effectuate mitigation of customer bills, and Nucor supports incorporating those refunds into the NYISO settlement process as the preferred and most feasible method.

³⁶ See *id.* at 39, Figure 9.

³⁷ *Id.* at 36.

If the “incentivizing energy efficiency and conservation” (demand destruction) path were to be explored, the Department would need to perform a thorough assessment of customer and economic impacts, which the Brattle Report does not attempt.

3. Section V.C – Preventing Emissions Leakage to Neighboring Energy Markets [Pages 23-27]

Brattle accurately notes that imposing a supplemental carbon charge that is materially greater than RGGI prices would free up RGGI allowances for use in other states, and thus promote emission leakage to neighboring RGGI states.³⁸ This is a valid concern even if border carbon charges are assessed on imports, and reinforces the complexity and inherent instability of implementing a single-state, electric-only, carbon charge while simultaneously participating in RGGI.

E. Section VI – Benefits of Pricing Carbon into the Wholesale Energy Market [Pages 30-38]

The Brattle Report estimates that a carbon price added to wholesale energy prices using the PSC’s current SCC estimate could produce 2.6 million tons of reduced carbon emissions annually.³⁹ The Report surmises that the added carbon charge would likely incentivize the following types of operational and investment changes to abate emissions at a cost at or below the price of carbon:⁴⁰

1. Shifting unit commitment and dispatch toward lower emitting existing resources. [Pages 31-32]
2. Tilting investment in renewable resources (procured under CES using Tier I RECs) toward those that generate at the times and places that displace the most carbon. [Pages 32-33]

³⁸ *Id.* at 23-24.

³⁹ *Id.* at 30-37.

⁴⁰ *Id.* at 30-38.

3. Supporting investment in new, efficient gas-fired combined cycle generation that can displace higher-emitting existing generation and imports. [Pages 33-35]
4. Supporting investment and operation of distributed energy resources, including storage and demand response. [Pages 35-36]
5. Promoting energy efficiency, through higher per-kWh charges, even if demand charges, customer charges, or overall customer costs decrease. [Pages 36-37]

The Report also includes a section describing Brattle’s expectation that a carbon surcharge would encourage “other innovative solutions and idiosyncratic decarbonization opportunities that are difficult to imagine today.”⁴¹ However, the notion of innovative and idiosyncratic opportunities not imagined today that is generally described in the Report is, by definition, speculative and therefore not further discussed here.

Taking each of those potential carbon abatement sources in turn:

- 1. None of the estimated carbon reductions are connected to the operation, dispatch or unit commitment of the existing generation fleet, although existing generation would be the beneficiaries of \$3 billion in higher wholesale energy prices**

The principal purpose of the wholesale energy markets administered by NYISO is to ensure the reliable and cost-effective security constrained dispatch of the state’s available resources. If a supplemental carbon charge were to be added to wholesale energy prices, emission rates would also be factored into the dispatch for the express purpose of influencing dispatch-related emissions. Brattle did not study likely impacts on existing dispatch and unit commitment at all, although this is a fundamental question if \$3 billion in additional energy costs were to be directed as incremental revenues to the existing generation fleet.

As discussed above, meaningful emissions-related dispatch changes Upstate appear to be improbable because most of the energy produced today in the region has no associated carbon

⁴¹ *Id.* at 30.

emissions, and that percentage will only increase unless poor performance by intermittent generation mandates increase reliance on fast starting peaker units. Downstate, material carbon-reducing dispatch seems equally implausible based on transmission constraints and the need to dispatch In-City fossil generation to follow load and chase peak demand. If an added carbon charge does not materially change system dispatch from a carbon emissions perspective, it is reasonable to ask where the money went and what value New Yorkers received. This requires a combined assessment of economic, reliability and emissions that has not been, but must be, performed. Further, based on what has been documented regarding the “Tale of Two Grids,”⁴² separate Upstate and Downstate assessments are necessary.

2. The Report assumes an 0.8 million ton reduction associated with “tilting” Tier 1 renewable resources to locations that would have a more favorable impact on marginal emissions rates⁴³

Long-term RECs authorized under the CES program are designed to promote and support new renewable energy investments. The Brattle Report hopes that an added carbon charge would influence the location and operation of that new investment. Specifically, the Report assumes that 2,000 MW of land-based wind capacity would be located in sites more favorable for carbon reduction than might otherwise occur.⁴⁴ There is no analysis in the Brattle Report of LBW siting potential, transmission need, land availability, or any other relevant consideration to support this supposition. The Report concedes that this potential carbon reduction benefit is “highly uncertain.”⁴⁵

⁴² Power Trends at 8.

⁴³ The Report’s marginal emission rate analysis was derived from NYISO’s 2010 Wind Study. Report at 32.

⁴⁴ *Id.* at 31-32.

⁴⁵ *Id.*

3. The Report estimates 0.5 million tons associated with encouraging an estimated 710 MW of new combined cycle generation to replace existing generation with higher marginal heat rates

Since the adoption of NYISO’s market rules at the turn of the century, natural gas-fired combined cycle units have dominated market-based capacity resource additions (*i.e.*, capacity not subsidized by the New York Renewable Portfolio Standard program).⁴⁶ Thus, in the broadest sense, the Report assumes carbon reduction credit for a capacity development trend that is already firmly entrenched in New York. The Report assumes that each MW of additional combined cycle capacity will displace half of a MW of peaking capacity (which is the principal source of the marginal emission rate improvement) but does not examine whether this is at all feasible given the necessary dispatch of peaking combustion turbine (“CT”) units for a small number of hours in a year for reliability purposes, particularly fast starting units, and particularly in the NYC area.

The Report also assumes that 250 MW of new combined cycle generation will be added in Zone C, which is dominated by nuclear capacity, so such new generation would be competing with zero emission units (which the carbon price adder would favor) for dispatch.⁴⁷ The Report acknowledges that increased subsidized renewable generation likely would depress wholesale energy and capacity prices (a core lesson learned from the Ontario and UK carbon pricing experiments), which would discourage new combined cycle market entry (particularly with declining overall demand).⁴⁸ Based on these considerations, a more consistent appraisal of the New York market suggests that new combined cycle market-based capacity entry, especially in the Upstate zones, will become increasingly difficult as CES-assisted renewable resources are added to the network. In short, applying the carbon price adder Upstate certainly will increase

⁴⁶ See 2017 Goldbook at 3-4; see also Report at 2, Fig. 2 (emissions by generator type).

⁴⁷ Report at 34.

⁴⁸ *Id.* at 33.

energy revenues to all existing infra-marginal generation but would not materially improve prospects for new fossil-fueled generation investment in the zone.

4. The Report estimates 0.1 million tons associated with energy storage and demand response displacement of peaking generation

This estimated carbon savings is predicated entirely upon carbon charge-driven higher energy prices encouraging energy storage and demand response to function in NYC for a small number of peak hours annually in order to displace peaking CT operation.⁴⁹ There is little question that flattening peak demand served by fossil-fired generation and finding ways to serve that peak through non-emitting resources is a core challenge. Existing demand response programs are important resources today for both reliability (SCR) and economic (EDRP) purposes, and Con Edison has been implementing dynamic load management plans to help avoid the need for T&D expansion. The relevant questions concern 1) whether the discouraging effect that a carbon price adder will have on other electrification efforts where carbon pricing does not apply (which Brattle acknowledges in its energy efficiency and conservation discussion) would outweigh potential energy storage benefits, and 2) whether more straightforward and less complicated peak load management efforts (*i.e.*, improved price signals) would produce superior results. Both of these crucial questions seem to fall beyond the scope of the Brattle study but need to be examined.

5. Nearly half of the carbon abatement that the Report estimates from a carbon charge (1.2 million tons annually) is attributable to demand destruction among large customers in New York

The Report estimates that the supplemental carbon charge would increase energy prices in New York by \$3 billion annually, but also assumes in Section VII, Impact on Customer Costs, that a carbon fund created by emissions assessments imposed on fossil-fueled generations would

⁴⁹ *Id.* at 34-35.

negate almost half of that amount if refunded ratably.⁵⁰ When estimating carbon abatement benefits in Section VI, however, the Report pivots and assumes instead that the Commission would leave the energy price increases in place and direct a non-volumetric per customer refund.⁵¹ The Report assumes that only large customers that are electric price sensitive (*i.e.*, those that are “attuned to an increase in volumetric rates”) would respond, and that they would react by reducing their electric consumption by 5%, or 2.5 TWh of electric usage per year.⁵² What is completely missing from this assessment is any recognition that large manufacturing customers are electric price sensitive in the first place because electric power costs are crucial to their facilities’ economic competitiveness.⁵³ Such operations are already driven by competitive pressures to invest in cost-effective energy efficiency equipment and to operate as efficiently as possible. Consequently, a carbon charge that targets large energy-intensive businesses in New York (and that is not paid by any of their competitors) and produces a 5% reduction in electric usage equates to reduced production, fewer shifts, and job losses.

Including large customer demand destruction as a claimed benefit of the carbon surcharge undermines the central thesis of the Report that a new carbon charge could be added above New York’s state-directed clean energy mandates without materially impacting customers or the New York economy. As noted above, this also would thoroughly undermine New York economic development and job retention programs expressly designed to prevent high energy prices from causing such losses. The loss of large, high load factor facilities during low load hours would

⁵⁰ *See id.* at 40, Figure 9.

⁵¹ *Id.* at 36.

⁵² *Id.*

⁵³ The Industrial Chapter of the Clean Energy Fund administered by NYSERDA looks to help address the pressures facing energy-intensive manufacturers that operate under tight margins due to competitive pressures. DPS Matter 16-00681, In re Clean Energy Fund Investment Plan, NYSERDA’s 2017 *Clean Energy Fund Investment Plan*, filed November 1, 2017, Industrial Chapter, section 5.1.1. (describing the need for the Continuous Energy Improvement program).

also aggravate the potential for zero or negative pricing hours in Upstate zones with high amounts of renewable energy production.

Overall, without the assumed large customer load loss and the highly speculative locational “tilt” to renewable project installations, Brattle only estimates a total annual carbon emission reduction of 600,000 tons statewide from an added carbon charge costing the State’s consumers \$3 billion per year (or roughly \$5,000 per ton). This demands a more expansive assessment of cost-effective carbon abatement options for New York.

F. Section VII – Impact on Customer Costs [Pages 38-61]

Using the social carbon cost estimated in the CES Order, Brattle calculates a net (*i.e.*, the SCC minus a fixed RGGI cost) carbon charge of \$40/ton to add to wholesale energy prices.⁵⁴ In its static analysis, the carbon charge increased wholesale energy clearing prices by an average of \$19/MWh, although estimated results varied by NYISO zone.⁵⁵ The analysis assumes that NYISO would apply a carbon charge to internal generation and imports based on marginal emission rates. In this fashion, non-emitting generators would receive wholesale energy prices inflated by the carbon charge and fossil fueled generators would receive the adjusted energy price net of their implied carbon charge, so that units with lower emission rates than the marginal unit would see a net increase in energy revenues.

The supplemental carbon charge, before considering the potential “offsets” discussed below, will add \$3 billion in annual energy costs to New York residents and businesses⁵⁶ that would be added to the hefty burden already imposed by prevailing New York clean energy programs, the costs to be incurred for utility distributed system platforms, transmission

⁵⁴ Report at 38.

⁵⁵ *Id.* at 43.

⁵⁶ *See supra* note 4.

investments required to support LBW development, and the costs of advanced metering initiatives. New York’s investor owned utilities correctly noted in recent comments in the Value of DER proceeding that “the State must make the best use of every customer dollar if the ambitious 50 percent renewable energy by 2030 goal is to be met,”⁵⁷ and that admonishment applies with equal or greater force in this matter. Unmitigated, the customer cost impacts of a carbon surcharge to wholesale energy prices that duplicates carbon costs already included in the PSC-directed programs will be unacceptably high with little carbon reduction benefits to show for it. The effort to harmonize potentially disparate policies, which Nucor supports, must realistically balance the mounting impacts on New York ratepayers, and a serious assessment of the probable economic consequences of a supplemental carbon price added to energy prices is essential.

1. Section VII.B.2 – Refund of Carbon Revenues Fund to Consumers [Pages 43-44]

As illustrated in Figure 9, the Report estimates that returning the carbon fund to customers initially would offset almost half of the \$19/MWh higher energy cost statewide.⁵⁸ This reflects the fact that, statewide, Brattle calculated that the average generator emission rate in New York is about half of the marginal rate upon which carbon charges would be calculated. Upstate, given the preponderance of existing non-GHG emitting generation, actual marginal emissions rates will be significantly higher than the average rate. Also, the growth in negative LBMPs, curtailed wind production and downward dispatch of conventional hydro and wind resources all indicate Upstate system conditions in which non-dispatchable carbon-free sources increasingly are displacing

⁵⁷ Case 15-E-0751, In the Matter of Distributed Energy Resources, *Comments of the Joint Utilities to Staff Whitepaper on Community Distributed Generation Compensation After Tranche 3*, dated October 3, 2017 (supporting Staff recommend changes to limit cost shifts to non-participating customers).

⁵⁸ Report at 40, Fig. 9.

flexible resources that also are GHG emissions-free while producing no net carbon abatement benefits (*i.e.*, the marginal emission rate is zero).

Significantly, the Brattle Report analysis is based on a “snapshot” look at the year 2025, but its static analysis used 2015 data for emissions rates of marginal, market-clearing resources.⁵⁹ Brattle examined unit marginal emission rates in each zone for each hour of 2015. If an Upstate zone did not have a marginal unit in a given hour, Brattle assigned it the marginal emission rate of the marginal unit in the nearest adjacent zone. If, for example, actual generator carbon emissions in Zone C were zero (*e.g.*, all nuclear), Brattle might assign the zone the emissions rate of a marginal fossil-fired generator in Zone A. Brattle also assigned a marginal emissions rate for the hours Upstate when hydro is on the margin (*i.e.*, zero MER), which was approximately twenty percent of the intervals studied, using a proxy emissions rate based on an hour with a comparable energy LBMP in which hydro was not on the margin.⁶⁰ Consequently, in Brattle’s study, every zone is presumed to have a carbon-emitting generator on the margin in every hour. These adjustments likely would systematically inflate the calculated marginal emission rates in Upstate zones as well as the estimated amount of the carbon fund available to offset costs to customers of the carbon surcharge. As more clean energy resources are added, and marginal emissions rates drop, the level of the fund would diminish, but that also is not reflected in Brattle’s analysis.

In addition, Brattle does not disclose average emission rates by zone or hour, which would provide a clearer image of the number of tons of carbon emitted by the generation sector by zone and time of day.⁶¹ Clearly, substantial additional analysis is required regarding the calculation of

⁵⁹ *Id.* at 38.

⁶⁰ *Id.* at 42.

⁶¹ *Id.* at 41.

the expected carbon fund and the dollars that actually can be expected to be available to mitigate customer costs.

Next, the linchpin of Brattle’s customer cost impact assessment in Section VII of the Report is the assumption that the carbon fund would be ratably returned to customers so that ratepayers would see a dollar-for-dollar offset.⁶² This seemingly would only occur if the carbon adjustment were directly factored into NYISO’s settlement process. This crucial issue requires substantial coordination of NYISO’s settlement process, the ratemaking decisions of both FERC and the Commission, and New York’s regulation of energy service companies serving as LSEs.

Finally, as noted above, the assumed dollar-for-dollar refund of the carbon fund stands in distinct contrast to Brattle’s estimated emission reduction benefits from carbon pricing (shown in Section VI), which assumed instead that a volumetric refund is not authorized so that higher energy prices could depress large customer energy usage.⁶³ For each carbon charge or crediting system considered, a thorough and consistent assessment of customer cost impacts must be performed. Also, the traditional ratemaking criteria of adequacy, efficiency, and fairness, which Brattle has not investigated, would need to be applied in all cases.

2. Section VII.B.3 – Lower ZEC Prices [Pages 44-46]

The Commission’s CES Order established ZEC payments to the four Upstate nuclear units from 2017 into the year 2029 using six two-year tranches. The pricing formula adopted by the Commission sets a base ZEC price using the SCC adopted in its BCA Order.⁶⁴ For tranches 2-6, this estimated carbon cost will be increased for inflation.⁶⁵ Next, the formula reduces the ZEC

⁶² *Id.* at 39.

⁶³ *Id.* at 36.

⁶⁴ Case 14-M-0101, Proceeding on Motion of the Commission in Regard to Reforming the Energy Vision, *Order Establishing the Benefit Cost Analysis Framework*, dated January 21, 2016. (“BCA Order”).

⁶⁵ CES Order at 138-141.

cost for a fixed estimate of RGGI-auction carbon prices that are already captured in NYISO energy prices. From this adjusted ZEC price, the formula subtracts forecasted energy and capacity prices for each tranche period using Zone A energy and Rest of State estimated capacity prices to the extent that this estimated price exceeds \$39/MWh. The basic formula is as follows:

$$(SCC - RGGI) - (\text{estimated energy and capacity market price in excess of } \$39/\text{MWh}) = \text{ZEC price}$$

Because the nuclear units are physically located in Zones B and C and transmission constraints currently can cause a material differential in estimated market prices between those zones and Zone A, the Commission authorized a one-time update to the \$39/MWh benchmark based on historic data on the zonal price differences.⁶⁶

The Brattle Report assumes that increased wholesale energy prices associated with the supplemental carbon charge would yield a dollar-for-dollar reduction in the ZEC subsidy provided under the Commission's CES Order to the four Upstate nuclear power plants.⁶⁷ Brattle adjusted the benchmark price of \$39/MWh stated in the ZEC formula to \$49/MWh for inflation and concluded that a \$40/ton net carbon cost would overwhelm the ZEC subsidy (*i.e.*, exceed the benchmark by more than enough to set the ZEC price to zero) and would increase the nuclear generator's net revenues by \$9.70/MWh above prices expected under the established ZEC formula.⁶⁸ Assuming annual Upstate nuclear plant energy generation at historic levels of approximately 28,000 GWh, Brattle estimates that this would provide Exelon with additional revenues of more than \$270 million per year.⁶⁹ There is, however, no provision in the CES Order to update the benchmark price of \$39/MWh for anything other than the zonal differential. Hence,

⁶⁶ *Id.* at 141.

⁶⁷ Report at 44-45.

⁶⁸ *Id.* at 45.

⁶⁹ *Id.*

Brattle's adjustment of the benchmark price from \$39/MWh to \$49/MWh for inflation is erroneous. Using the Commission-directed benchmark of \$39/MWh actually would produce more than \$550 million per year in increased revenues for Exelon above the authorized ZEC formula price.⁷⁰

In other words, with respect to ensuring continued operation of the Upstate nuclear units, the suggested supplemental carbon price adder is redundant with the price support already provided to the Upstate nuclear units by ZECs (*i.e.*, it is completely unnecessary) and provides more than half a billion dollars in additional annual revenues to the units' owner without adding a single kilowatt hour of additional clean energy to the New York grid. ZEC prices charged to ratepayers will appear to be smaller or get absorbed altogether in a larger energy price adder (which is the assumed ZEC offset in the Report), but this completely ignores the point that customer payments to the nuclear units will increase significantly, the adder would eliminate the customer cost safeguards ordered by the Commission in setting the ZEC price formula, and there are no associated carbon benefits.

3. Section VII.B.4 – Lower REC Prices [Pages 46-48]

In the CES Order, the Commission determined that construction of renewable generation required long term REC contracts, stating,

Investors simply will not look to build renewable generation facilities without sufficient certainty that they will successfully earn a return on their investment. In the case of the type of long-lived capital investment necessary to construct and operate a generation facility, a long-term contract or other durable mechanism providing reasonably certain terms will be necessary to induce such investment.

⁷⁰ It also bears noting that, as infra-marginal generation, Upstate large conventional hydro units also would experience substantial additional revenues. Based on 2015 production, if all of the NYPA St. Lawrence, Niagara and Blenheim-Gilboa (pumped storage) facilities' production were sold into the energy market, NYPA would realize an additional \$411 million annually from an energy price increase of \$19/MWh. Thus, nearly one-third of the \$3 billion in annual carbon surcharge revenues would be realized by NYPA and Exelon with no expected incremental carbon abatement of any kind.

Without the assurances that a long-term contract provides, the renewable generation projects that the State requires will not come to fruition.⁷¹

Based on this finding, the Commission provided that NYSERDA should execute long term (ten years or longer) CES Tier I REC contracts. This in turns means that all REC contracts executed by NYSERDA prior to implementation of a carbon price adder will produce double-recovery of the SCC for all years in which carbon prices are not netted from REC payments. The Report does not address this double recovery but states only that “we assume prices for fixed price REC contracts that are already in place or signed before a carbon charge is planned would not be affected.”⁷² Thus, as a foundational matter, NYISO and PSC energy policies must avoid imposing excessive costs on consumers due to unwarranted windfalls to project developers caused by overlapping CES and NYISO carbon pricing policies.

Prospectively, the Report assumes that “each dollar of expected increase in wholesale energy prices would reduce REC prices for new resources by a dollar” because, “all else equal,” the higher energy prices would allow Tier I renewables to be developed and enter the market at a lower REC price.⁷³ The Report acknowledges, however, that the “all else equal” presumption is unlikely.⁷⁴ Consistent with the Commission’s finding in the CES Order, it remains reasonable to expect that renewable project developers will continue to demand long term REC price guarantees that are not found in wholesale energy prices (with or without a carbon price adder), so any offsetting benefits to RECs pricing likely will be lower than Brattle estimated.⁷⁵ Certainly, EPA’s recent re-estimation of the SCC highlights the regulatory risk associated with a supplemental

⁷¹ CES Order at 99.

⁷² Report at 28 and 45.

⁷³ *Id.* at 28.

⁷⁴ *Id.* at 28-29.

⁷⁵ *Id.* at 28.

carbon charge and the way it is calculated and adjusted. In short, it is not at all certain how, or if, REC prices may be affected by a supplemental carbon charge to energy prices that could be revised materially at any time by NYISO or the PSC. The overlap generally with the REC program as well as the prospects for any realistic REC price benefits requires closer scrutiny by the Department.

VI. Suggestions on the Process Going Forward

There are a wide range of carbon abatement possibilities to consider in New York. A coherent approach might focus principally on PSC-jurisdictional actions (*e.g.*, EV deployment and time-of-use pricing), coordinated and synergistic NYISO and PSC actions (*e.g.*, public policy determinations concerning transmission upgrades), or NYISO actions supported by the PSC (*e.g.*, adding a carbon charge to wholesale energy prices). Before debating alternatives, Nucor urges the Department to focus systematically on the analyses required to assess any potential coordinated NYISO and PSC strategy. Nucor provides a list of topics below for analyses that the Department, IPPTF and NYISO stakeholders should perform.

State renewable and distributed energy programs, stagnant load growth and lower underlying fuel costs are combining to produce historically low energy and capacity prices in organized wholesale power markets. This has prompted various efforts to adjust market price formation concerns, including PJM’s “Proposed Enhancements to Energy Price Formation.”⁷⁶ It is important to distinguish the Department’s efforts through the IPPTF to align NYISO and state-directed “decarbonization” public policy strategies from wholesale market formation questions that should be addressed directly through the established NYISO stakeholder process.

⁷⁶ Proposed Enhancements to Energy Price Formation, PJM Interconnection (Nov. 15, 2017), *available at* <http://pjm.com/-/media/library/reports-notice/special-reports/20171115-proposed-enhancements-to-energy-price-formation.ashx?la=en>.

From a carbon reduction perspective, coordinated “win-win” strategies will need to leverage market forces that tap carbon abatement opportunities with the greatest potential for cost-effective reductions. GHG reduction actions in New York will necessarily come from the sectors with the greatest potential (transportation and residential) if the technology is available and there is a discernible value proposition for the end user.⁷⁷ This requires a thorough and robust assessment of the electric system, potential areas for cost-effective carbon abatement, and market barriers.

VII. Suggested Topics for Future Technical Conferences

The Department should consider the following topics for future technical conferences:

1. Addressing electric system needs arising from New York’s renewable energy target
2. Harmonizing New York’s economic development and Clean Energy Strategies
3. Addressing the disparate system reliability, dispatch and clean energy issues affecting Upstate and Downstate New York

VIII. Suggestions for Analysis

The template of the Brattle Report provides an outline of some of the questions that should be systematically assessed. For any carbon abatement policy under consideration, the IPPTF must realistically appraise carbon reduction potential, existing state price supports, customer cost impacts, regulatory barriers that may be impeding development, consistency with other established State policies and emerging trends. With those basic considerations in mind, Nucor recommends undertaking the following studies discussed below.

⁷⁷ Notably, in the industrial sector, significant emissions reductions occurred in the last two decades in the American steel industry as the industry invested in electric arc furnace (“EAF”) based steel-making methods using recycled steel scrap as its basic feedstock. Making steel in this fashion produces roughly one-third the carbon emissions per ton of steel produced compared to traditional iron ore and coke blast furnace methods. Today, more than 65% of the steel produced in the U.S. uses the EAF technology that is employed by Nucor Steel in Auburn, New York. *See Carbon “Footprints” in U.S. Steel-making*, a Steel Manufacturers Association White Paper by John Stubbles, October 2007. Electrification of this manufacturing sector required cost-competitive electric supply as well as substantial changes in steel mill operations (*i.e.*, to become more responsive to electric system conditions).

A. Studies by IPPTF

1. Assess expected carbon reductions in the electric sector from the proposed changes in RGGI targets, the beneficial effects of the recently announced plans for Virginia and New Jersey to join RGGI, and other RGGI-related matters before pursuing a “go it alone” single-state, increased carbon charge to electric price approach.
2. Assess the reasonableness of critical assumptions in the Brattle Report, including:
 - a. Assumed zonal marginal carbon emission rates;
 - b. The estimated magnitude of the “carbon fund”;
 - c. The reasonableness (indeed the feasibility) of the presumed “static” and “dynamic” offsets to the expected customer cost impacts of a carbon surcharge; and
 - d. The expected impact, if any, on long-term REC prices if a substantial carbon surcharge to wholesale energy prices were to be implemented.
3. Assess whether NYISO or the PSC should be responsible for establishing and updating a carbon surcharge to wholesale energy prices.
 - a. Assess what criteria should be applied in calculating and updating such a surcharge and the record basis that would be required to support its implementation.
 - b. Identify and assess all germane stakeholder participation and process issues associated with implementing such a surcharge.
4. Assess economic and emissions “leakage” questions, and overlap, duplication and potential tension with the state-directed programs and RGGI.

B. Studies by NYISO

1. Assess the impact, if any, of a carbon price adder on the dispatch of existing generation with respect to dispatch order, power flows, constraints, and other pertinent economic and reliability considerations. All material Upstate/Downstate differentials should be identified.
2. Assess Upstate and Downstate fuel mixes and the thickness of fossil-fired generation dispatch by zone and time of day to establish a baseline for discussion of any carbon-oriented market-pricing options.
3. Assess the potential for zero or negative pricing periods in Upstate zones as renewable energy resources are added.
4. Assess actual generator average and marginal emissions rates, and tons of carbon emitted, by zone and hour, for a relevant study period.

- a. Assess the projected impacts on electric supply carbon emissions, by zone, of known or planned system changes (*e.g.*, Indian Point retirement, LBW project installations, other generator retirements (Cayuga), DER additions, etc.).
- b. Assess expected energy and peak demand requirements of EV-induced load growth.
5. Assess the legality, administrative feasibility and practical constraints associated with border issues posed by a carbon price adder.
6. Assess specifically how a carbon fund would be established and implemented.
7. Assess whether a carbon price adder should only be applied in zones in which annual system load factors are less than 50% and loads are served predominantly by fossil-fired generating units.
8. Perform system dispatch simulations of forecasted conditions, including a base case, high and low fuel cost, and major transmission upgrades to assess both changes in the costs of dispatch and estimated changes in electric supply sector carbon emissions.

C. Studies by PSC

1. Conduct an analysis of the carbon abatement effects in increased electrification in the residential, commercial, industrial and transportation sectors and the need for pricing and rate design mechanisms required to minimize the contribution of such electrification activities to system peak loads (*i.e.*, how can such incremental load contribute to rather than degrade utility system factor).
2. Assess the extent to which a carbon surcharge to wholesale energy prices will discourage needed electrification in other sectors.
3. Assess the system benefit of high load factor electrified manufacturing that operates during low load periods in zones in which renewable generation is “bottled up” and negative pricing conditions are increasing.
4. Assess how a carbon price adder could be implemented without undermining the purpose and design of the Recharge NY power allocation program implemented by NYPA in accordance with Economic Development Law amendments launched by Governor Cuomo in 2011, as well as other announced State economic development and job retention initiatives.
5. Consider whether to direct NYSERDA to immediately revise all CES REC-related contracts to prevent double recovery of carbon costs if a carbon price adder to wholesale energy prices is implemented.

IX. Conclusion

The Brattle Report struggles with the inherent complexities of adopting overlapping NYISO and PSC policies when looking to price an estimated carbon cost in rates charged to New York consumers. Nucor urges the Department to adopt a methodical, fact-based approach to developing coherent and sustainable NYISO and PSC strategies for supporting New York's decarbonization goals, and urges the Department to adopt the comments and recommendations described above for achieving those objectives.

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