AGREE New York
Alliance for a Green Economy
2013 East Genesee Street
Syracuse, NY 13210
315.480.1515

Nuclear Information and Resource Service
6930 Carroll Avenue, Suite 340
Takoma Park, MD 20912
301-270-NIRS

April 22, 2016

VIA ELECTRONIC MAIL

The Honorable Kathleen H. Burgess
Secretary
New York State Public Service Commission
Empire State Plaza, Agency Bldg. 3
Albany, NY 12223-1350

Re: Case #15-E-0302: Proceeding on Motion of the Commission to Implement a Large-Scale Renewable Program and a Clean Energy Standard.

Dear Secretary Burgess:

Alliance for a Green Economy and Nuclear Information and Resource Service are nonprofit parties to the Clean Energy Standard case, intervening from a public interest, environmental, and consumer perspective. We hereby submit these comments in accordance with the April 8, 2016 "Notice of Comment Period for Staff White Paper and Cost Study."

Respectfully submitted,

/s/
Jessica Azulay Chasnoff
Alliance for a Green Economy

/s/
Tim Judson
Nuclear Information and Resource Service

NEW YORK STATE
PUBLIC SERVICE COMMISSION

----------X
Proceeding on Motion of the Commission
to Implement a Large-Scale Renewable
Program and a Clean Energy Standard: Case 15-E-0302

----------X

COMMENTS BY ALLIANCE FOR A GREEN ECONOMY
AND NUCLEAR INFORMATION AND RESOURCE SERVICE

Jessica Azulay Chasnoff
Alliance for a Green Economy
2013 E. Genesee St.
Syracuse, NY 13210
315-480-1515
jessica@allianceforagreeneconomy.org

Tim Judson
Nuclear Information and Resource Service
6930 Carroll Avenue, Suite 340
Takoma Park, MD 20912
301-270-NIRS
timj@nirs.org

Dated: April 22, 2016

NEW YORK STATE
PUBLIC SERVICE COMMISSION

----------X
Proceeding on Motion of the Commission
to Implement a Large-Scale Renewable
Program and a Clean Energy Standard: Case 15-E-0302

----------X

COMMENTS BY ALLIANCE FOR A GREEN ECONOMY
AND NUCLEAR INFORMATION AND RESOURCE SERVICE

Alliance for a Green Economy ("AGREE") and Nuclear Information and Resource Service ("NIRS") are nonprofit parties to the above-referenced Clean Energy Standard case, intervening from a public interest, environmental, and consumer perspective. We hereby submit these comments in accordance with the April 8, 2016 "Notice of Comment Period for Staff White Paper and Cost Study."[1]

[1] Found here: http://documents.dps.ny.gov/public/Common/ViewDoc.aspx?DocRefId={47FFD51C-0ED9-4C89-9A4F-CFC71F8A44C3}

Table of Contents

I. Introduction

AGREE and NIRS applaud Governor Cuomo and the New York Public Service Commission ("Commission") for taking an important step to address the serious issue of catastrophic climate change. Though New York has been making some progress toward meeting its renewable energy goals, our state has lacked an *enforceable* Renewable Portfolio Standard requiring utilities to meet aggressive mandates for the purchase of renewable energy. Without these mandates, New York has made inconsistent and relatively slow progress in meeting its renewable energy aspirations, especially when compared to states that do have enforceable utility purchasing requirements for renewable energy.

AGREE and NIRS support the creation of a Clean Energy Standard, in general, but we are opposed to the inclusion of nuclear subsidies, as outlined in the White Paper authored by Department of Public Service

Staff ("Staff").[2] Nuclear energy is *not* a clean energy source. The classification of nuclear power as "clean energy" would be a slap in the face to those – from the American Southwest to the Fukushima region of Japan – who have suffered and continue to suffer the health and environmental effects of radioactive waste and environmental contamination.

AGREE and NIRS recognize that New York is at a nuclear crossroads, with multiple reactors poised to close because they have become too expensive to compete in the market. We understand the pressure that the Commission is under to buy time for these plants, but creating an uncompetitive, blank check policy for nuclear is not a sensible answer to these developments.

Nuclear power has become increasingly unpopular, with a majority of Americans now opposing nuclear energy.[3] Unable to compete in the market, and unable to convince the public that reactors are safe, the nuclear industry's last hope is to make it seem as though reactors are the only option for Upstate jobs, tax revenues, or climate mitigation. The nuclear industry has waged an effective PR campaign to convince policymakers that shuttering nuclear plants would lead to economic catastrophe in Upstate New York and jeopardize our climate goals.

Yet, the facts say otherwise, as we will detail in these comments.

Though nuclear energy is often seen as a carbon-free energy source, it remains one of the most dirty (and dangerous) ways to generate electricity. The nuclear fuel cycle is rife with environmental racism against Native American, indigenous, and other environmental justice communities, elevated cancer rates for miners, energy intensive and greenhouse gas emitting processes, radioactive leaks and emissions, thermal pollution of rivers and lakes, intractable nuclear waste issues, and environmental catastrophes.

Nuclear proponents have frequently claimed that providing support for nuclear energy provides a "bridge" to a renewable energy future. To the contrary, the *closure* of unprofitable nuclear reactors is a true bridge to the renewable energy economy. Freed from wasting ratepayer money on these old plants, New York's consumers could invest in clean technologies and a grid that supports them. This path would provide more durable and long-term investments in the state's decarbonization efforts.

Our analysis below will show that New York has all the tools necessary to increase its energy efficiency and renewable energy targets to accommodate a rapid phase-out of nuclear power while meeting its climate goals.

We urge the Commission to approve a Clean Energy Standard that is truly clean, and move with haste to put enforceable renewable mandates in place, based on low-cost power purchase agreements ("PPAs"). We think it is appropriate and necessary to consider higher renewable energy targets, than those articulated in the Staff White Paper.[4]

---

[2] NY Department of Public Service Staff. January 25, 2016. "Staff White Paper on Clean Energy Standard" http://documents.dps.ny.gov/public/Common/ViewDoc.aspx?DocRefId={930CE8E2-F2D8-404C-9E36-71A72123A89D}

[3] Gallup. March 18, 2016. "For First Time, Majority in U.S. Oppose Nuclear Energy" http://www.gallup.com/poll/190064/first-time-majority-oppose-nuclear-energy.aspx

[4] In support of these recommendations, we observe that a large portion of in-state generation credited to meeting the renewable goal in the Clean Energy Standard is comprised of large hydro facilities built decades ago, which are

We also urge the Commission to improve upon the Staff proposals in order to create a comprehensive policy, robust enough to ensure New York will meet its greenhouse-gas emissions reduction goals while achieving energy affordability and equitable access to the benefits of energy efficiency and renewables. A comprehensive policy would include not just renewable energy purchasing mandates for utilities, but also aggressive energy efficiency mandates. New York currently lags other leading states in its energy efficiency progress, and remedying this should be a key goal of a Clean Energy Standard policy. Setting and enforcing strong energy efficiency goals will help reduce costs for consumers and make the state's renewable energy goals easier to meet.

We additionally join with other parties in calling for the inclusion of an offshore wind commitment as part of the Clean Energy Standard policy. We believe an offshore wind tier is necessary to make sure New York will begin immediately developing offshore wind, a resource with incredible potential that will need several years of lead time to develop.

We further call on the Commission to pay particular attention to the needs of low-income consumers, small businesses, and cash-strapped municipalities as it moves forward with a Clean Energy Standard policy. The pending Low-Income Energy Affordability proceeding is a critical piece of New York energy policy that must be improved and then approved in concert with the Clean Energy Standard. Without a progressive rate structure in place, any policy that adds costs to customer bills will disproportionately and unfairly impact our state's most vulnerable households and communities. This will be the case even if the overall economic benefits of the Clean Energy Standard outweigh the costs. We cannot afford for low-income populations and municipalities to bear disproportionate costs while those with access to capital disproportionately reap the benefits.

All of these proposed improvements to the proposed Clean Energy Standard are discussed in further detail below.

II. Discussion of Proposals

A. Renewable Energy

1. 50 by 30 Goal, Obligation and Compliance Mechanism Calculating the 50 by 30 Mandate

not always included in definitions of renewable energy. By those standards, the Clean Energy Standard represents a 35% increase in renewable energy by 2030 from that initial base of hydro. This represents a less aggressive deployment of renewable energy than some other states have adopted. This has the effect of further backloading renewable energy development by making it appear the state has progressed further than it has. Effectively, the Clean Energy Standard will increase renewables by only 24 percentage points between now and 2030. However, that then puts off deployment of 30-50 percentage points of renewables until after 2030. It is anticipated that emissions reductions at the later stages of meeting an 80% by 2050 goal will be more difficult than progress at earlier stages, so it would be better to frontload as much easily achievable renewable energy and efficiency as possible in the 2030 timeframe to support deep decarbonization in the 2030-2050 period.

The DPS white paper is overly conservative in its projections of renewable generation required to meet the 50% renewable energy goal. This is due principally to significant underestimates in three categories:

- **On-shore Wind:** numerous flaws (detailed below), resulting in unnecessarily low and sporadic development projections.
- **Off-shore Wind:** no development starting until 2028, though at least two projects totaling 1,700 MW are already being planned.
- **Residential and Commercial Solar PV:** appears to tie all development of solar to the existence of the NY-Sun program, with declining deployment after 2019, and no new distributed solar PV after the current NY-Sun program expires in 2023.

In addition, DPS has greatly underestimated energy efficiency potential, resulting in 2030 electricity load projections that are either too high, or do not account for achievable levels of electrification in transportation and heating.

Together, these aspects of the Staff analysis in the white paper are both unuseful for planning purposes, and, if used as the basis for policy development, could limit development of renewable energy and efficiency – and therefore greenhouse gas reductions -- rather than enhance them. As a result, significantly higher levels of renewable generation should be achievable by 2030 in New York than are reflected in the white paper. The Commission should be careful not to adopt the white paper's renewable generation projections inappropriately as a ceiling on clean energy deployment in New York State by 2030, but rather consider them as an absolute floor, or worst-case scenario.

It is difficult to analyze Staff's projections because no meaningful detail is provided in the available documents. However, based on our own analysis and what we are able to understand about Staff's projections, there are significant flaws in the white paper and Draft Supplemental Environmental Impact Statement ("DSEIS"), which make it unreasonable to use them as a realistic baseline model for the Clean Energy Standard. We review some of the most significant flaws with the white paper analysis of on-shore wind to illustrate.

On-Shore Wind Energy Costs and Generation

Staff projects generation costs (as Levelized Cost of Energy, or "LCOE") that are significantly higher than other credible price forecasts, including the National Renewable Energy Laboratory ("NREL") and Lazard. NREL's 2015 cost report cites the LCOE for wind resource tranches TRG 2 and 3 (which the cost analysis states are most representative of New York) at $55 and $61/MWh, respectively.[5] Lazard 2015 reflects a similar value, of ~$55/MWh.[6] DPS projects costs ranging from $58-$70 starting in 2019 (depending on the windfarm size), despite projections that the costs of wind will continue to decline between now and 2019.

A major contributing factor skewing this cost analysis may be that it incorrectly factors in the federal Production Tax Credit ("PTC"). Staff incorrectly shows LCOE costs of wind rising as a result of the expiration of the PTC.[7] The Lazard and NREL cost estimates cited are made without reference to

[5] National Renewable Energy Laboratory. Annual Technology Baseline (ATB) Spreadsheet 2015. http://www.nrel.gov/analysis/data_tech_baseline.html

[6] Lazard. Lazard's Levelized Cost of Energy Analysis – Version 9.0. November 2015. https://www.lazard.com/perspective/levelized-cost-of-energy-analysis-90/

[7] DPS. Clean Energy Standard White Paper - Cost Analysis. April 8, 2016. Pages 139-141.

subsidies or financing mechanisms, but rather are estimates of unsubsidized costs, necessary to compare energy resources on a level playing field. Had Staff done this part of the analysis correctly, it would be clear that:

- Wind generation enjoys significant cost advantages over essentially every other available generation resource as long as the PTC is in effect. There is a significant benefit to incentivizing deployment of new onshore wind resources as rapidly as possible, particularly with the prospect of additional Renewable Energy Credit ("REC") revenues under the Clean Energy Standard, which is an incentive New York has never provided but other states have employed successfully.
- Wind generation costs after expiration of the PTC would be substantially lower than in Staff's projections, making wind more cost-competitive and potentially reducing the costs of RECs and/or long-term PPAs.

The Staff's cost projections inexplicably show wind generation costs rising both as a function of time and of increasing wind generation capacity. Wind generation costs, on a levelized basis, are almost universally projected to continue declining over the next several years, due to improvements in industrial production and wind turbine technology. NYSERDA's notes stating that inflation will outpace the experience curve are nowhere explained or justified. Certainly, New York could expect rising deployment of wind generation to result in lower construction costs, with greater experience and workforce development, among other factors.

By the same token, Staff's analysis shows costs increasing at what appear to be extraordinary rates of cost escalation in each capacity tranche (citing the 2025 supply curve):

10-30 MW projects:	rising 235% from 10 MW to 3,000 MW total capacity
30-100 MW projects:	rising over 55% from 30 MW to ~4,300 MW total capacity
100-200 MW projects:	rising ~30% from 100 MW to ~1,750 MW total capacity

Wind costs should decline as deployments increase, with the economies of scale created in larger wind farm installations. And finally, there are no cost estimates for wind farms larger than 200 MW. NY has at least one such windfarm (Maple Ridge, at over 320 MW) and projects of such size are common in other parts of the country, contributing, as they do, to economies of scale in permitting, planning, supply chain contracts, etc.

The cost analysis also uses an unusually high fixed operation and maintenance ("O&M") cost of $70 per kilowatt-year. Adjusting that to a generation cost in MWh, using the 36.3% capacity factor for onshore wind reflected in the DSEIS, yields a fixed O&M cost of $22/MWh. NYSERDA further adjusts the O&M cost by a factor 1.1 to account for regional labor market differences, yielding a value of $77/kW-yr., or $24.21/MWh. However, O&M costs for wind are only partially comprised of labor costs, so it is inappropriate to adjust the entire O&M cost at the labor cost rate. NREL cites a fixed O&M cost of only $51/kW-yr., or $16/MWh at the same capacity factor. NYSERDA's base cost estimate is 37% higher than NREL's, and the adjusted O&M cost estimate is over 50% higher.

Finally, the white paper's estimate of feasible wind capacity is also unusually low. This appears to be due to a geospatial model that builds in an extensive number of siting restrictions, beyond what is factored into NREL's assessments of wind potential. But the resulting wind siting map shows almost no development in some of the state's most favorable locations, including the south and southeastern shores of Lake Ontario. In contrast, NREL's most recent assessment of state-by-state wind potential

(February 2015) estimates 139,000 MW in New York, for 2014 turbine technology and 110m rotor heights.[8]

Interestingly, NREL's estimate for New York using near-future turbine technology and 140m rotor heights is slightly lower, at 128,000 MW, suggesting that present-day technology and more moderate rotor heights are a better fit for New York conditions. If more restrictive siting guidelines were applied -- which already encompass most of NYSERDA's siting criteria -- and only 10% of NREL's identified potential were developed, there would be nearly 14,000 MW of new wind generation in New York. A reasonable goal would be to develop at least half of that by 2030 (7,000 MW, or 5% of the identified potential in NREL's analysis).

Wind Energy Trends in New York and Other States

It is true that New York has not developed as much wind generation as the state's wind potential would suggest is possible. But this is a matter of policy-making rather than a proof of the viability of the resource. Other states have been much more successful than New York in expanding wind generation, even states that have less viable wind potential. New York's 139,000 MW of viable wind capacity is greater than any other state in the Northeast and Mid-Atlantic -- including Maine (129,000 MW) -- and is more than the other ten states in the region combined (CT, DE, MA, NH, NJ, PA, RI, VA, VT, and WV). Yet those ten states together had about 50% more wind generation installed than New York in 2015.[9] In fact, just two of those states (PA and WV) together have more installed wind capacity than New York, with just over one-third of New York's wind potential between them.

In addition, other states have been developing wind capacity much more quickly than New York in recent years. In the last five years, New York has only added 346 MW, whereas Texas has built 7,336 MW (1,470 MW/year); Iowa 1,890 MW (378 MW/year); Kansas 2,492 MW (498 MW/year); Illinois 1,099 MW (220 MW/year); Colorado 1,192 MW (238 MW/year). And this has occurred in a period of policy uncertainty, due to the short-term extensions of the federal PTC.[10]

The difference in New York's wind development is explained by a failure to provide the proper policy signals, which the Clean Energy Standard presents an opportunity to correct. It is not that New York has not demonstrated the capability to develop substantial amounts of wind. In a roughly 12-month period in 2008-2009, New York brought over 600 MW of new wind online.[11] The 320 MW Maple Ridge wind farm was brought online in a construction time of less than one year (2005 -2006).[12] The difference is the pricing signals for wind that have changed over time, and the state has not responded. 70% of New York's wind generation was built during a period of skyrocketing market electricity prices (2005-2009), and less than 30% since then, despite the fact that nearly 55% of wind capacity nationwide was developed since 2009. With the decline in market prices in New York in 2009, and no corresponding response from the state to support continued wind energy development, investments in wind slowed to a halt in 2010 and have not regained momentum since then.

---

[8] National Renewable Energy Laboratory. Estimates of Land Area1 and Wind Energy Potential, by State, for areas >= 35% Capacity Factor at 80, 110, and 140m. February 2015.

[9] U.S. Department of Energy. "U.S. Installed Wind Capacity". February 10, 2016. http://apps2.eere.energy.gov/wind/windexchange/wind_installed_capacity.asp

[10] Ibid.

[11] Renewable Energy World. 330 MW of Wind Power Go Online in New York. http://www.renewableenergyworld.com/rea/news/story?id=54646

[12] Iberdola, SA. Maple Ridge Wind Project. http://iberdrolarenewables.us/cs_mapleridge.html

The Clean Energy Standard could provide the necessary policy response to put wind generation back on track in New York, but the Commission must properly understand the cost and financing needs of the industry, best practices in other jurisdictions, and develop the right policies to ensure affordable and efficient development of wind generation to meet renewable energy and emissions targets in 2030 and beyond.

Energy Efficiency Potential and Trends

The white paper projects energy efficiency as a factor in meeting the renewable energy goals, as it affects total statewide electricity demand. The projection in the white paper is based on load forecasts in the NYISO 2015 Gold Book, extended out to 2030 and adjusted for estimates of Behind-the-Meter (BTM) resources (primarily distributed solar PV) and a certain amount of load growth (8,615 GWh) due to electric vehicles (EVs) and heat pumps, or beneficial electrification technologies (BETs), to borrow a useful term from NY-GEO's comments. On net, Staff projects a net load reduction of 10.6 TWh in 2030 from 2015.

Several aspects of DPS's forecasts are not clearly explained and the calculations are not provided, but it appears that energy efficiency forecasts are in line with the state's performance, historically. Disaggregating the contributions of BETs and BTM generation yields an annual net efficiency performance of 0.6% to 0.7%, on average. It is worth noting that the detailed load and efficiency projections provided in Appendix B (p. 2) of the white paper reveal a non-standard methodology for efficiency projections. DPS includes separate projections statewide energy demand prior to counting energy efficiency, which are offset by the energy efficiency projections of annual Cumulative Average Range of Energy Efficiency. The latter is represented as a constant figure of 2,227 GWh of energy efficiency each year, or 1.367% of statewide load in the 2015 base year. This is unusual. Energy efficiency calculations are normally done as a compound interest rate from the base year, with each year's net reduction decreasing proportionally as constant/average efficiency rates provide smaller returns relative to decreasing loads year-over-year.

Given the difficulty in recreating DPS's calculations and methodological questions such as the one just described, we calculated our own analogous estimates for energy efficiency and statewide energy demand. Based on our calculations, by adopting best practices already demonstrated in other states, a significantly greater level of energy efficiency is achievable by 2030. The state's presumed efficiency rate of 1.367% is substantially lower than other leading states exhibiting best practices. The American Council for an Energy Efficient Economy has tracked state energy efficiency programs for nearly a decade, evaluating states' programs, policies, practices, and performance comprehensively, across many different energy sectors from transportation to space heating and electricity usage.

While New York has rated consistently high in some areas of energy efficiency, the state has trailed leading states in areas related to utility efficiency programs -- and electric energy efficiency most of all. New York's lagging performance in these areas have contributed to the state's declining overall ranking recently.

- New York has slipped from #3 to #9 overall in ACEEE's ratings, over the last three years.
- New York has consistently ranked significantly lower on electricity efficiency and home/heating efficiency.

The electricity efficiency measure is the most relevant for the electricity load projections. On average, New York has lagged the top states by 1.52% on electricity efficiency over the last six years, but by well

over 2% on two occasions, and never closer than .87%. NY has only been in the top 10 once. And in case 2015 looks like an aberration, NY was still 1.58% behind the #2 state, which was at 2.50%.[13]

Year	Overall Rank	Electricity Efficiency Rank	Electricity Efficiency Rate (%)	Top State	Top State Efficiency Rate (%)	Differential (%)
2010	4	21	0.33%	VT	2.59%	-2.26%
2011	3	15	0.68%	VT	1.64%	-0.96%
2012	3	14	0.84%	VT	2.32%	-1.48%
2013	3	7	1.25%	VT	2.12%	-0.87%
2014	7	10	1.13%	RI	2.09%	-0.96%
2015	9	17	0.92%	RI	3.51%	-2.59%

ACEEE attributes New York's lower rating in utility efficiency performance to the fact that the state has not adopted best practices exhibited by states like Massachusetts and Rhode Island, such as mandatory efficiency standards analogous to renewable energy standards. Whether set as part of the Clean Energy Standard or through another proceeding, enforceable efficiency targets would yield substantial reductions in greenhouse gas emissions and reliance on dirty energy sources. It would also support increased electrification of transportation and heating while increasing renewables, substantially amplifying the state's efforts to reduce emissions.

As best practices and state efficiency performance have improved, ACEEE has raised the bar for evaluating states' programs. For instance, in the last two years, states received top ratings for electricity efficiency of 2.0% per year. But because the top states are now exceeding 2.5% per year, ACEEE's 2016 ratings will set that as the new standard.[14] By improving electricity efficiency programs consistent with best practices, New York could either reduce electricity demand much farther than projected in the white paper by 2030, or the state could accommodate more electrification of transportation and heating while achieving the renewable energy goals.

---

[13] American Council on an Energy Efficient Economy.
The State Energy Efficiency Scorecard. http://aceee.org/state-policy/scorecard
Gilleo, Annie, Seth Nowak, et al. The 2015 State Energy Efficiency Scorecard. American Council on an Energy Efficient Economy. October 2015.
Gilleo, Annie, Anna Chittum, et al. The 2014 State Energy Efficiency Scorecard. American Council on an Energy Efficient Economy. October 2014.
Gilleo, Annie, Anna Chittum, et al. The 2013 State Energy Efficiency Scorecard. American Council on an Energy Efficient Economy. November 2013.
Foster, Ben, Anna Chittum, et al, et al. The 2012 State Energy Efficiency Scorecard. American Council on an Energy Efficient Economy. October 2012.
Sciortino, Michael, Max Neubauer, et al, et al. The 2011 State Energy Efficiency Scorecard. American Council on an Energy Efficient Economy. October 2011.
Molina, Maggie, Max Neubauer, et al. The 2010 State Energy Efficiency Scorecard. American Council on an Energy Efficient Economy. October 2010.
[14] ACEEE. 2015. Page 29.

Using analogous parameters to the white paper analysis (efficiency, net load growth/reduction, BTM generation, EVs and BETs), yields the following projections. In each of the following cases, we start with a 2017 base year from the white paper (159,894 GWh) and calculate cumulative energy efficiency gains for 2030 based on compounding a selected efficiency rate. We use the white paper's estimate for total electrification from 2017-2030 and an estimate of BTM generation that seems to be included in Staff's calculations. The differences between the four efficiency rates are the following:

- Using a compounded energy efficiency rate of 2.0% or 2.5% per year, and offset that by a compounded annual load growth rate of .5%
- Using a compounded net energy efficiency rate based on a representative New York State historical rate (0.634%), and increased by 1.0% or 1.5%.

Efficiency Rate	**2030 Efficiency (GWh)**	**Background Growth (GWh)**	**Electrification (GWh)**	**BTM Generation (GWh)**	**Net Load Reduction (GWh)**	**2030 Load**
2.0%/year	37,187	10,711	8,296	4,500	22,680	137,214
2.5%/year	45,153	10,711	8,296	4,500	30,646	129,248
NYS Net EE trend + 1.0%	35,204	0	8,296	4,500	31,408	128,486
NYS Net EE trend + 1.5%	44,007	0	8,296	4,500	40,211	119,683

There is a danger in relying on unnecessarily or unrealistically conservative projections of efficiency and renewables. By underestimating reasonably achievable development of these resources by 2030, the white paper:

- Anticipates unnecessary conflicts between the renewable energy standard and other important measures for reducing emissions, such as electrification of transportation and heating;
- Leaves no room for other contingencies, such as the closure of aging and uneconomical nuclear generation; and
- Diverts focus to alternative compliance mechanisms under the presumption that Clean Energy Standard targets will be even more difficult to achieve than the white paper analysis has already made them.

In short, a more accurate analysis of renewable energy and efficiency potential and costs -- as well as a critical analysis of trends in New York and in states that have achieved higher rates of efficiency and renewables -- would yield a more favorable policy framework for the CES. By our analysis, presented in Appendix A:

- 56 terawatt-hours (TWh, or million MWh) per year of new renewable generation could be developed by 2030.
- Total in-state renewable generation could reach 92 TWh/yr. by 2030, including large-scale hydro and BTM solar PV.
- Net load reductions through energy efficiency could reach 33-43 TWh/yr.
- NYS could substantially exceed both the 50% renewables and 40% emissions reduction targets, even without nuclear power.
- The Clean Energy Standard could accommodate significantly higher levels of electrification in transportation and heating than in the white paper analysis.

The commission should, therefore, promulgate the Clean Energy Standard to facilitate faster and greater levels of renewable energy deployment. Doing so would make it possible to achieve a number of important objectives:

- Faster and deeper reductions in greenhouse gas emissions in the power generation sector.
- More rapid conversion to electric transportation and heating, facilitating total statewide emissions reductions without complicating assessments of Clean Energy Standard compliance.
- Accelerate cost reductions through economies of scale, innovation, and industrial engineering.
- Enhance job creation and economic development statewide through expansion of industries in renewable energy, transportation, heating, and efficiency, as well as the opportunity to capture job gains in manufacturing and supply chain industries.

REC Creation and Design

AGREE and NIRS support Staff's proposal for REC creation: one REC for each megawatt-hour of electricity generated by a renewable generation source. Given that the renewable energy goals for the proposed Clean Energy Standard are quite conservative, though, we are concerned that the design of RECs and LSE requirements will create a ceiling, instead of a floor for renewable energy development. More consideration should be given to how to develop a policy that encourages and fosters even faster rates of renewable energy growth than contemplated by the Staff White Paper.

2. Eligibility and Tiers

Renewable Tier Structure and Number. AGREE and NIRS are agnostic on the number of renewable energy tiers in the Clean Energy Standard. On its face, Staff's proposal seems to make logical sense as a way to balance the state's goals of deploying new renewables, preserving old renewables, and keeping costs low for consumers. We agree with the flexible and wide grouping of various energy sources within each tier as a way to foster competition and diversity of options for Load Service Entities ("LSEs").

Nuclear Tier Inconsistent. The exception is Tier 3, the Nuclear Tier, which does not include competition or flexibility. The proposed Nuclear Tier is instead designed to guarantee the profitability of nuclear reactors, regardless of cost. As the tier is currently proposed, nuclear reactors would neither be competing with each other or any other resource. In fact, with the retirement of Entergy's FitzPatrick reactor before the Clean Energy Standard is implemented, the nuclear tier could end up being a subsidy to only one company, which would also happen to be the single largest merchant generation owner in the state. Therefore, the nuclear tier serves to protect a large incumbent industry from any competition

whatsoever and to lock LSEs into buying credits from only one kind of resource. In this way, the design of that tier is incongruent with the design of the other tiers.

Offshore Wind Commitment Needed. While generally supportive of the idea of broad and flexible tiers, we think it is important for the state to provide a mechanism to ensure the development of offshore wind. It is now widely understood that the state would have a hard time meeting its climate goals without developing its vast offshore wind resource potential. It is further in the state's interest to support rapid deployment of that resource at a large scale because that will be the most economical for consumers and provide New York the opportunity to benefit from the manufacturing and construction capacity needed to support the large-scale development of offshore wind.

Offshore wind development will require significant lead time and a commitment to purchase the power at a stable price. It is obvious that if New York is to benefit from this resource, an offshore wind policy is needed as part of the Clean Energy Standard. As members of the Win Wind Coalition, we add our voices to the numerous organizations calling for an offshore wind tier with the target of developing 5,000 megawatts of offshore wind by 2025.

Though it may seem incongruous for us to call for a carve-out of above-market subsidies for the offshore wind industry, while opposing a carve-out for nuclear plants. Yet, these two industries not be more different. Nuclear power has had decades to prove itself as a viable technology and achieve economies of scale. At every turn, the nuclear industry has failed to live without subsidies and bailouts, and has become increasingly expensive. It has failed to address or mitigate its enormous environmental and health impacts, and aside from a few localized communities, provides little economic development for New York. On the other hand, offshore wind is a new technology, poised to become cost-competitive if given the right supports and commitments by the state. Offshore wind has the potential to provide economic development in all regions of New York because we can create policies to support a supply chain for wind here in New York. An offshore wind tier also need not be uncompetitive in the same way that the nuclear tier is. Multiple companies would be eligible to compete for offshore wind development contracts and PPAs, while the nuclear tier is nothing more than a gift to one (or maybe two) incumbent companies. Most importantly, offshore wind is a technology that promises to carry New York forward toward its renewable energy goals for decades to come, while nuclear's lifespan is coming to an end.

Energy Efficiency Mandate Needed. In the same vein, we join many other parties in calling on the Commission to include an energy efficiency tier or other mechanism of enforcement around the state's energy efficiency goals. Just as New York struggled to meet the goals of its previous Renewable Portfolio Standard, the state has similarly missed its energy efficiency targets because they were not enforceable. As energy efficiency is the least-cost clean energy resource and one that has some of the highest co-benefits for consumers, it makes no sense for New York to enforce renewable targets without similar enforcement of efficiency targets. We go into much more detail about energy efficiency in other sections of these comments.

Carve-out or co-incentives for locally and community-owned renewables. The Staff White Paper proposal would allow utilities to meet their obligations by buying out-of-state renewable energy, limited to energy production areas that border New York State. However, whenever possible, it's better for ratepayers if their dollars stay in New York and support local or community-owned renewable energy development. The report Advantage Local: Why Local Energy Ownership Matters, produced by the Institute for Local Self Reliance, illustrates why it is important for Renewable Portfolio Standards to

promote local ownership.[15] The economic and jobs impact of local renewable energy development are much higher, by orders of magnitude, when compared to out of state purchasing. Additionally, locally owned renewable energy projects meet less local resistance, especially when the host community will financially benefit from the development.

AGREE is a co-founder of the Energy Democracy Alliance, which is a statewide collaboration of community-based and grassroots organizations, policy analysists and others working together to advance a just and participatory transition to a resilient, localized and democratically controlled clean energy economy in New York. One of the main goals of the Energy Democracy Alliance is to ensure equitable distribution of ownership of sustainable energy assets in New York, particularly through local, community, and cooperative ownership models.

We urge the Commission to require that LSEs purchase Renewable Energy Credits ("RECs") from in-state sources, with a priority on locally owned and community owned renewable energy. This could be achieved through a carve-out of RECs in Tier 1 reserved for locally-owned and community owned resources, or through a co-incentive that recognizes the added benefit to ratepayers and communities of locally and community owned resources.

3. Cost Management

The proposed Alternative Compliance Mechanism should be set high enough that it is only triggered in circumstances of real scarcity of RECs. Rather than setting a low Alternative Compliance Mechanism, there are several ways that the Commission can approach cost-management of the Clean Energy Standard program. These include:

Long-term Power Purchase Agreements. The Staff's cost analyses show that bundled PPAs are likely the most cost effective strategy for procurement of renewable energy.[16] Renewable energy has the benefit of a stable and predictable cost, because costs are largely up-front, rather than dependent on variable fuel prices. Thus, it is in the interest of consumers to pay as close to the actual procurement prices for renewables as possible, rather than a price driven by risk-related financing costs or speculation. We think it is imperative that the Commission require utilities enter into long-term bundled Power Purchase Agreements for large-scale renewables as a way to keep costs low.

Abandoning the Nuclear Tier. The cost report prepared by staff provides almost no meaningful information about the costs of the nuclear tier. The document projects the costs for the first 5 years as between $59 million and $658 million. This is such a large range as to be basically useless for the purposes of evaluating the policy. The report offers no methodology for how those numbers were computed. Based on what we know about the losses at Ginna and FitzPatrick, we expect the nuclear tier is more likely to cost approximately $4.8 billion through 2030. As we will detail below, the costs of nuclear power are rising significantly, making it likely that the costs of the proposed Nuclear Zero

[15] Institute for Local Self-Reliance. September 24, 2014 "Advantage Local: Why Local Energy Ownership Matters" https://ilsr.org/report-advantage-local-clean-energy-ownership-matters/

[16] Department of Public Service. April 8, 2016. "Clean Energy Standard White Paper–Cost Study" Pg. 38 http://documents.dps.ny.gov/public/Common/ViewDoc.aspx?DocRefId={7B564AD9-E6E9-4FA9-93B6-1AA85B1719E2}

Emissions Credits will increase over the life of the Clean Energy Standard. This will create significant bill impacts for consumers, while providing no discernable long-term advancement of the state's energy goals. There is a good chance that ratepayer money dumped into propping up unprofitable nuclear plants will turn out to be a waste, as nuclear plants close anyway due to expensive equipment failures and license expirations.

Progressive Rates. According to a report from 2013[17] (the last time New York State studied the issue), the 1 million households living under the federal poverty level paid more than 22% of their income toward their energy bills. Nearly half of those households paid more than 40% of their income toward energy bills. Even moderate income households at 200% of the federal poverty level showed energy burdens above the 6% energy affordability threshold. Affordable energy continues to be out of reach of low- and moderate-income New Yorkers. In 2014, 177,000 households saw their utility bills shut off for nonpayment.[18]

Unless New York implements a progressive rate structure – one that ensures affordability for low-income households – the burden of subsidies for the nuclear and renewable energy resources supported through the Clean Energy Standard will fall disproportionately on low-income households. The Commission's pending proceeding on Energy Affordability for Low-Income Utility Customers will improve utility low-income discount programs. But the Staff Straw Proposal would severely underfund the program as compared to the need, and will be inadequate to ensure affordability for all low-income New Yorkers even at today's energy rates.[19] With billions more added to customers' bills for nuclear bailouts and renewable energy credits, it is critical that the Commission put into place a true progressive rate structure as part of its comprehensive Reforming the Energy Vision (REV) agenda.

B. Nuclear Facilities

1. Nuclear Market Conditions

The white paper greatly mischaracterizes the economic challenges facing nuclear reactors in New York by focusing solely on the lower wholesale market prices for electricity, and then in attributing the pricing dynamic primarily to competition from natural gas generation. While it is true that market prices have decreased significantly from their peak in 2008 (in New York and elsewhere), that is not the sole or even

---

[17] Roger D. Colton. October 2013. "Home Energy Affordability in New York:
The Affordability Gap (2012)" http://www.fsconline.com/downloads/Papers/2013%2010%20CY12_NY_HEAG-final.pdf

[18] Department of Public Service Staff. June 1, 2015. Staff Report for Case 14–M-0565-Proceeding on Motion of the Commission to Examine Programs to Address Energy Affordability for Low Income Utility Customers.
http://documents.dps.ny.gov/public/Common/ViewDoc.aspx?DocRefId={73F1F127-09C1-460D-9F42-D6AE106B3C52}

[19] See the comments by Public Utility Law Project:
http://documents.dps.ny.gov/public/Common/ViewDoc.aspx?DocRefId={EA2B8804-00BA-4012-9492-D8959E0F5C61}
See also comments by 34 organizations and elected officials:
http://documents.dps.ny.gov/public/Common/ViewDoc.aspx?DocRefId={95E55838-89A1-4732-9499-22F2F4C2AD5C}

the primary factor making particular reactors uneconomical on a going forward basis and decreasing the profitability and potentially the long-term viability of others.

Rather, it is a persistent trend of super-inflationary cost escalation that has been exhibited in the nuclear industry over the last decade or more. According to biannual industry-wide surveys conducted by the Nuclear Energy Institute, annual operating costs[20] for U.S. nuclear power plants rose by 58% between 2002 and 2012 -- a rate of 4.6% per year -- from an average of $27.91/MWh (USD 2012) to $44.17/MWh.[21] The cost of all aspects of plant operations have been rising, but the trend is driven by steep increases in capital costs, at least partially due to rising maintenance needs of aging reactors. The average age of a nuclear reactor in the U.S. is 36 years, very near the life expectancy reflected in the 40-year term of the original federal operating licenses.

New York's reactors are much older than the national average, with a median age of 43 and a mean of over 41. Two of them are among the oldest reactors still running in the world: Nine Mile Point 1, which will be 47 in 2016, is the oldest operating reactor in the U.S. and the third-oldest in the world; Ginna is the fourth-oldest in the U.S. and the seventh-oldest in the world. No commercial reactor has ever operated to fifty years, much less the sixty years contemplated in the white paper.

There are other site-specific characteristics that affect nuclear operating costs, reflected in a wide cost distribution in the NEI data. For instance plants with a single reactor have higher fixed O&M costs ($50.54/MWh in 2012) than multi-reactor plants ($39.44/MWh). By the same token, it is well-known that nuclear plants with smaller generating capacity have higher unit costs of operation than larger plants. Broken down by plant operating cost, the highest-cost quartile of reactors averaged $62.36/MWh in 2012, while the lowest-cost quartile averaged $28.22/MWh, very close to the industry-wide average cost in 2002 of $27.91/MWh.

Nuclear reactors in New York have among the least favorable cost profile. Most of them are smaller than the average size of a reactor in the U.S. (1,080 MW), with Nine Mile Point 2 the sole exception (1,311 MW). While the Indian Point reactors are just slightly below average generating capacity, the other three are significantly smaller:

Nine Mile Point 1:	621 MW	58% of average
R.E. Ginna:	581 MW	54% of average
James A. FitzPatrick:	838 MW	78% of average

Ginna and FitzPatrick are also single-reactor power plants, and over 40 years old, placing them in the worst cost profile in the industry. It is therefore no surprise that they are the first reactors in New York to become unprofitable, with large cash flow deficits. Ginna currently requires subsidies of about $84 million per year through the Reliability Support Services Agreement ("RSSA") contract the Commission has authorized.[22] The cost of the Ginna RSSA is roughly equal to the projected margin between the reactor's going forward costs and market revenues. Entergy has projected annual cash flow deficits at

[20] Inclusive of fuel, capital, and operations and maintenance expenses.
[21] Nuclear Energy Institute. Nuclear Energy 2014: Status and Outlook: Annual Briefing for the Financial Community. February 13, 2014.
[22] New York State Public Service Commission. Order Adopting the Terms of a Joint Proposal. February 23, 2016.

FitzPatrick over $60 million per year, over the next five years[23] -- lower than Ginna, but probably mitigated by FitzPatrick's larger generation capacity, slightly younger age, and slightly higher prices in its market zone.

When Entergy originally purchased FitzPatrick from the New York Power Authority, the deal included a ten-year fixed price PPA under which the New York Power Authority purchased FitzPatrick's output at a price of $32/MWh -- or $44.04 in 2015 dollars. It is reasonable to presume that Entergy anticipated FitzPatrick's operations to be profitable at that price. In order for FitzPatrick to post cash flow deficits of $60 million/year going forward implies that its operating costs have risen significantly greater than the rate of inflation.

2. Nuclear Tier

a. There is no policy basis for Tier 3

In initiating the Clean Energy Standard proceeding, the Commission cites the 2015 State Energy Plan as the main policy basis giving it the authority to create the Clean Energy Standard program:

> Consideration of a CES is consistent with the Commission's statutory responsibility, pursuant to State Energy Law §104(5)(b), to render decisions and set policies that are reasonably consistent with the 2015 SEP.[24]

Specifically, the Commission cites goals articulated in the State Energy Plan that New York must meet 50% renewable energy targets and 40% greenhouse gas emissions reductions by 2030. While the State Energy Plan clearly provides a policy foundation upon which to create the renewable tiers in the Clean Energy Standard proposal, it provides no such rationale for the nuclear tier.

In fact, the State Energy Plan is utterly silent on the question of how to address the potential closure of nuclear reactors before their licenses expire. This is not for lack of information from nuclear energy policy experts, like AGREE and NIRS, who called on the Energy Planning Board to grapple with the issue of unprofitable nuclear reactors. Despite these comments, the 2015 State Energy Plan makes no mention of a policy to prevent the closure of struggling upstate reactors.

The State Energy Plan does, on the other hand, list numerous negative environmental, security, and safety hazards posed by nuclear power plants and the challenges regarding radioactive waste storage and decommissioning.[25]

---

[23] Knauss, Tim. Entergy: Closing FitzPatrick nuke will save up to $275M over 5 years. Syracuse Post-Standard. November 2, 2015. http://www.syracuse.com/news/index.ssf/2015/11/entergy_closing_fitzpatrick_will_save_up_to_275m_over_5_years.html

[24] Public Service Commission. January 21, 2016. "Order Expanding Scope of Proceeding and Seeking Comments." http://documents.dps.ny.gov/public/Common/ViewDoc.aspx?DocRefId={C29C66EA-CE42-4FD2-B679-19A39E0F1C4F}

[25] See 2015 State Energy Plan Volume 2, Impacts and Considerations, Pages 33-35; and Volume 2, Sources, Pages 23-25. http://energyplan.ny.gov/Plans/2015

The Commission and Staff have stated numerous times that the rationale for the nuclear tier is related to the need to maintain a base of carbon-free electricity. Yet, surely the Commission knows that between one-half and two-thirds of the nuclear plants that would potentially be helped by the nuclear tier in the Clean Energy Standard will be shuttered by 2030, even if they receive consumer subsidies now.

The preservation of the Robert E. Ginna reactor and Nine Mile Point 1 will not help the state meet the 2030 greenhouse gas emissions goals because both of those reactors will see their licenses expire in 2029. Meanwhile, FitzPatrick will likely not be preserved, either, as Entergy has clearly and repeatedly stated its intention to shut that reactor next year. That leaves only Nine Mile Point 2 as the only potentially tier-3-eligible reactor that could have any impact on the state's 2030 goal or beyond.

New York needs a plan for replacing closing reactors with zero-carbon energy sources if it is going to meet its 2030 greenhouse gas emissions goals. Propping up reactors that will be closed by then is not such a plan. It is just a waste of money that could otherwise be used to build replacement resources and accelerate the transition to a clean energy economy.

Is the Commission setting implied or secret interim emissions-reductions targets?

Commission and Staff have also claimed that preventing the closure of Upstate nuclear plants is necessary to prevent a near-term increase in greenhouse gas emissions. If this is the case, we invite the Commission and Staff to transparently declare what these near-term targets are so that the proposed policy can be properly considered and examined.

The State Energy Plan has no stated near-term greenhouse gas emissions targets upon which to justify the proposed nuclear policy. Again, this is not for lack of trying by the environmental community to convince the Energy Planning Board that near-term targets were needed. Many people spoke at public hearings on the Energy Plan and submitted written comments in favor of annual benchmarks leading up to the 2030 goal. Yet, the nearest term greenhouse gas emissions target stated by the Energy Plan is 2030. We can only assume it was a deliberate decision by the Planning Board not to set interim targets.

Even if interim greenhouse gas reduction targets are being implied now by the Clean Energy Standard policy, they are not being transparently provided. This raises due process concerns because it makes it impossible for parties and the public to test whether the proposed nuclear policy will advance these unspoken pre-2030 greenhouse gas reduction targets and whether alternatives are available.

Additionally, if such interim targets are becoming the basis for policy and massive ratepayer surcharges, there are many other areas of energy policy that will need to be brought into line with such targets. In fact, because electricity sector emissions have already been dramatically reduced and comprised only 20% of statewide emissions in 2011, reductions in other sectors will play a much larger role in meeting the state's targets. We would very much support the Commission if it were to begin making policy decisions based on a requirement to meet interim greenhouse gas targets before 2030. But those targets must be transparently presented and state policy should consistently support them. It is not fair to use such requirements to justify one nuclear bailout policy and then pretend they don't exist for other greenhouse-gas emitting activities.

The other policy bases cited by the Commission for the Clean Energy Standard is Section 5(2) of the Public Service Law, which directs the Commission to "encourage all persons and corporations subject to

its jurisdiction to formulate and carry out long-range programs . . . for the performance of their public service responsibilities with economy, efficiency, and care for the public safety, the preservation of environmental values and the conservation of natural resources."

Again, the renewable tiers proposed in the Clean Energy Standard are consistent with this law, but the nuclear tier is not. First of all, the nuclear tier does not contribute to the long-range greenhouse gas emissions goals because of the closure of Ginna and Nine Mile Point (and likely FitzPatrick) prior to 2030 and the closure of the rest of the reactor fleet by 2050. The nuclear subsidies would contravene other Commission obligations such as the care for public safety, the preservation of environmental values, and the conservation of natural resources. (See our comments below about the environmental and safety impacts of nuclear power.)

An argument has been made that the nuclear tier is needed because of nuclear power's contribution to the economics of upstate New York. Yet, these reported benefits are overblown because Staff has relied exclusively on reports paid for by nuclear proponents and has factored in none of the health and environmental costs of nuclear, nor the opportunity costs of favoring nuclear over renewables and efficiency.

There are far better and more cost effective ways to support the communities that have become over reliant on nuclear jobs and tax revenues in particular and the Upstate economy as a whole. These include:

- Prompt and responsible decommissioning of nuclear reactors, which can provide ongoing jobs for the nuclear workforce. There are hundreds of millions of dollars in decommission trust funds already set aside that can be immediately put into the economy once decommissioning begins. For instance, see our 2015 report, "Replacing FitzPatrick: How the Closure of a Nuclear Reactor can Reduce Greenhouse Gasses and Radioactive Waste, while Creating Jobs and Supporting the Local Community."[26]

- Transitional support for municipalities that will lose tax revenue as a result of nuclear closures, such as the $30 million recently approved by the New York State Legislature;

- As the Cuomo administration works to bring additional green manufacturing and other green jobs into the state, it should prioritize support for facilities to locate in communities that are transitioning away from dirty and dangerous energy sources. The development of green industry, such as the Solar City factory in Buffalo[27], the 1366

[26] The report can be found here: http://beyondfitzpatrick.org/wp-content/uploads/2015/11/replacing_fitzpatrick_updated.pdf

[27] Inhabit. June 15, 2015. "SolarCity's new Buffalo plant will create 5,000 jobs in New York" http://inhabitat.com/solarcitys-new-buffalo-plant-will-create-5000-jobs-in-new-york/

Technologies factor near Rochester[28], and the Soraa LED lightbulb factory in Syracuse[29], NY. Collectively, those three facilities alone will create 6,420 long-term jobs. According to news reports, they will receive $937 million in state support. Compared to this, the economic development value of the nuclear tier, which could cost over $4 billion to preserve approximately 2,300 jobs for just a few more years, pales in comparison.

The Nuclear Tier Contradicts Previous Commission Policy

Two decades ago, New York deregulated its electricity markets and forced utilities to sell off their nuclear power plants. In approving the sale of nuclear plants to lightly-regulated companies, the Commission determined that consumers would benefit from no longer being tied to the financial risks of nuclear plants. Nowhere was it contemplated that consumers would once again have to endure the nuclear albatross tied to their necks.

New York also has a history of refusing to classify nuclear power as clean energy or make it eligible for subsidies. In 2004, the Commission considered whether to include nuclear power in the Renewable Portfolio Standard and decided against it because of obvious and documented negative environmental impacts.

The proposed nuclear tier would undo both of these previous decisions by the Commission, and do so without proper opportunity to examine the costs and benefits. We would posit that none of the underlying facts that led to the previous orders on the inclusion of nuclear in the Renewable Portfolio Standard or the deregulation decisions have changed. Nuclear power has not become cleaner since 2004. Nor has it become cheaper or a better deal for consumers. In fact, quite the opposite, as Rochester G&E customers are now bearing the cost of $84 million per year in subsidies to Ginna. Yet, a dramatic and expensive change to precedent is being pursued on an expedited time-frame, with no evidentiary process under which parties can engage in discovery, cross examine witnesses, or present their own expert testimony.

Even the Clean Power Plan Rejected Nuclear Power as a Suitable Path to Greenhouse Gas Reduction

By bailing out nuclear power plants, New York would buck the advice of the U.S. Environmental Protection Agency ("EPA"). In developing the Clean Power Plan, the EPA considered whether support for existing nuclear power plants is a viable way for states to meet the goals of reducing carbon emissions from the power generation sector. However, in the final rule, the EPA determined that intervening to prevent the closure of uncompetitive nuclear plants was not a viable strategy for climate protection and put its faith in renewable energy instead.

In particular, EPA noted that maintaining existing nuclear generation does nothing to reduce carbon emissions (nor, presumably, other greenhouse gases), and that incremental additions of renewables and efficiency are more viable options. As a result, EPA determined that preventing the closure of existing

[28] Fortune. October 7, 2015. "Solar startup to build big factory in upstate New York" http://fortune.com/2015/10/07/solar-factory-upstate-new-york/

[29] Syracuse.com. October 29, 2015. "Cuomo announces LED lighting firm will create 420 jobs in DeWitt" http://www.syracuse.com/news/index.ssf/2015/10/cuomo_announces_led_lighting_firm_will_create_420_jobs_in_dewitt.html

nuclear reactors is not part of the Best System of Emissions Reduction, and therefore may not be credited toward achieving the emissions objectives set forth in the CPP:

> With respect to existing nuclear units, … we acknowledge that we lack information on shutdown risk that would enable us to improve the estimated 5.8 percent factor for nuclear capacity at risk of retirement. Further, based in part on comments received on another aspect of the proposal –- specifically, the proposed inclusion of existing RE generation in the goal-setting computations –- we believe that it is inappropriate to base the BSER in part on the premise that the preservation of existing low- or zero-carbon generation, as opposed to the production of incremental, low- or zero-carbon generation, could reduce CO2 emissions from current levels. Accordingly, we have determined not to reflect either of the nuclear elements [existing or under-construction reactors] in the final BSER.

If New York moves forward with the renewable energy mandates in the proposed Clean Energy Standard, there is little doubt the state will meet its compliance with the Clean Power Plan. This is regardless of what the state does about the closure of nuclear plants. However, it is important to note that the state will receive no credit at all under the Clean Power Plan for its support for old nuclear plants. If, instead, the state invested in more renewables, the state would gain additional credit under the EPA's compliance formula.

b. There is no technical basis for Tier 3

The Staff has provided no technical basis to justify the proposal for tier 3. The white paper includes several statements asserting that the closure of nuclear reactors would, presumably make it difficult if not impossible to meet its emissions targets:

- "Their closure would have dramatic impacts on New York, particularly the state's effort to lower GHG emissions."
- "The closure of the upstate New York nuclear plants due to the current natural gas market prices, and concomitant electric prices, would have a large negative impact on the State's ability to meet its carbon reduction goal."
- "This tier will prevent backsliding from the State's efforts to limit GHG emissions."
- "The nuclear tier supports a smooth emission-free transition from nuclear to non-nuclear resources in the event that energy prices are not able to support the continued financial viability of the plants during their license lives."

Yet, Staff has failed to provide any analysis that demonstrates the case that New York cannot meet its emissions objectives without subsidizing aging, uncompetitive reactors.

The electricity generation sector represented just 20% of statewide greenhouse gas emissions in 2011, and were already reduced 34% from 1990.[30] In order to meet the statewide 40% by 2030 goal set forth in the State Energy Plan, most of the reductions will need to come from other sectors. The emissions goal corresponds to 138.46 MMt CO2e in 2030 -- over 73 MMt less than in 2011. Yet electricity

[30] NYSERDA. New York State Greenhouse Gas Inventory and Forecast: Inventory 1990-2011 and Forecast 2012-2030. April 2014. Released June 2015.

generation, including imports, only accounted for 42.5 MMt in 2011. The Greenhouse Gas Inventory includes projections of emissions out to 2030, amounting to a reduction of only 2.35 MMt, and no analysis showing how the state might best achieve the emissions goal. Given the larger contributions other sectors -- particularly transportation and space heating -- make to the state's carbon emissions, the state will have to achieve most emissions reductions from there.

Furthermore, nuclear cannot be counted on to play much if any role in meeting the 2030 goal. While it does not say so directly, the eligibility criteria for Tier 3 would exclude the Indian Point reactors, which have not been relicensed and are not in compliance with both SPDES permits and the state's Coastal Management Plan. Presumably, it is not necessary for those reactors to operate in order to meet the emissions objective.

At the same time, two of the remaining reactors, Nine Mile Point 1 and Ginna, will no longer be operating in 2030, as their 60-year operating licenses will have expired in 2029. Thus, over 60% of New York's nuclear generating capacity will no longer be licensed to operate in 2030, regardless of the Tier 3 subsidies.

Entergy's decision to close FitzPatrick in January 2017 was announced before the Clean Energy Standard proceeding was initiated. Entergy has reaffirmed its decision to close the reactor on several occasions, including its filed comments in this proceeding. The retirement of FitzPatrick means that 75% of nuclear capacity will no longer be operating in 2030.

Therefore, New York will have to meet its emissions objectives without at least 75% of its current nuclear generation capacity. Given the rising costs of reactor operations, operational uncertainties, potential equipment failures, and the declining economies of scale as the other reactors shut down, it is possible that Nine Mile Point 2 will no longer be economical to operate before 2030. The reactor's owners could also determine to close the reactor because of business strategy considerations.

In addition, the white paper gives undue weight to whether reactors are licensed (or relicensed) to operate until a certain date. A reactor's operating license date is entirely irrelevant to whether it will or should continue to operate. Every commercial reactor that has ceased operations in the U.S. has done so long before its operating license expired, in some cases more than 20 years before (e.g., Rancho Seco and Fort St. Vrain). The primary driver in reactor closures is uneconomical operating and maintenance costs, often due to large, unforeseen maintenance expenses, but increasingly due to high and rising operating costs as reactors age.

Because of this uncertainty, the state's emissions objectives must not be tied to expectations that reactors can or must be made to operate for up to sixty years. As indicated above, the oldest reactors still operating in the world will be 47 years old this year, just months older than Nine Mile Point 1 and Ginna. There is no reason to believe that these two reactors will be economically or technically able to continue operating until 2029. It is entirely possible that operating costs will continue to rise, and that major components may need to be repaired or replaced unexpectedly if they are to remain operational for the next thirteen to fourteen years. The recent case of reactor internal components exhibiting unprecedented failure rates at Indian Point 2 is indicative of the type of unexpected and expensive, and possibly infeasible, repairs that may need to be made at any reactor in the state.

The white paper does not provide any analysis of these realities, nor consider any alternatives to how the state can meet the emissions objectives without most or all of its nuclear capacity in 2030. Luckily,

viable alternatives do exist. Rather than kicking the can down the road by subsidizing aging, uncompetitive reactors that are going to close anyway -- or may do so, regardless of subsidies -- it would be prudent to implement contingency measures to account for declining nuclear generation.

Taking into account the demonstrated feasibility of both higher renewable energy and efficiency levels than projected in the white paper, it is possible to meet the 2030 greenhouse gas emissions targets, even in a bounding case in which there is no nuclear generation and there is significant electrification in both transportation and space heating. In fact, as we illustrate above, net load reductions through enhanced energy efficiency programs alone could equal or exceed the 25,000 MWh of nuclear generation projected for Tier 3. At the same time, greater amounts of renewable generation than modeled in the white paper would make it possible to exceed both the renewable energy and emissions targets.

Taken together, higher efficiency and renewable energy levels than are modeled in the white paper would also make it possible to meet the 50% CES target while achieving much higher levels of electrification in transportation and space heating, without increasing electricity sector emissions, even without nuclear generation. In fact, because the use of fossil fuels for transportation and heating is so much less efficient than in generating electricity, it would be possible to reduce total statewide emissions more even in a bounding scenario in which electricity sector emissions remained constant in order to power more EVs and BETs.

Nuclear ZEC Costs and Irrational Subsidies

In light of the deficiencies in failing to demonstrate a technical basis for the nuclear tier in this proceeding, it is unacceptable that the Staff has not provided any meaningful analysis of the potential costs that the program would entail. Providing subsidies to nuclear has both a real cost -- the impact on customers' electricity bills -- and an opportunity cost, in using ratepayer dollars to subsidize aging, uneconomical nuclear reactors rather than to support renewables, efficiency, infrastructure, or other emissions reduction measures.

The costs of the nuclear tier are not likely to be small. The subsidies necessary to keep the smallest reactor in the state online -- Ginna -- for just two years are nearly $84 million per year. Entergy's reported loss projections of $60-$75 million per year are comparable in scale. And now Constellation has reported Nine Mile Point may soon be in need of similar levels of subsidies. Taken together, the four reactors the white paper contemplates being included in the nuclear tier program could require subsidies in the amount of $300-$400 million per year by 2020.[31] If implemented as proposed in the white paper, the nuclear tier could include charges totaling $4.8 billion by 2030.

That subsidy cost alone -- not including the market and capacity prices of energy for the nuclear output -- could pay for the construction of 2,650 MW of on-shore wind generation, under NYSERDA's locationally adjusted capital cost estimate. 2,650 MW is more than the difference between NYSERDA's projection of new on-shore wind under the CES and the amount we project in our analysis. If applied to RECs and not to full cost of construction – as would be the case -- obviously the billions proposed for

[31] Knauss, Tim. Nine Mile Point nuclear plant faces financial peril, exec says. Syracuse Post-Standard. March 31, 2016.
http://www.syracuse.com/news/index.ssf/2016/03/nine_mile_point_nuclear_plant_faces_financial_peril_exelon_exec_says.html

nuclear subsidies could instead be used to even more dramatically increase the amount of renewable energy in New York.

In addition, the pricing of the nuclear tier subsidies would be irrational, with units providing the least amount of generation receiving the most subsidies. For instance, under the recently approved RSSA, Ginna is being subsidized at an effective price of $17-$18/MWh. That is most likely a higher price than the level of subsidy Constellation would bid for to support Nine Mile Point 2, which generates more than twice as much electricity. So Ginna, which generates only 3% of the state's electricity, would be the most expensive component of the proposed nuclear tier (and possibly the entire CES), while providing only a marginal benefit toward achieving the presumed objectives.

At the same rate as under the RSSA, Ginna would receive over $1 billion under the CES before closing in 2029 (assuming it operated until license expiration), without providing any value toward meeting the 2030 emissions target. Nine Mile Point 1, while presumably benefitting from lower unit-based O&M costs due with Nine Mile Point 2, would compound this dynamic, potentially costing ratepayers over $850 million is nuclear ZEC purchases before closing in 2029. Together, the two smallest reactors in the state, accounting for only 6% of total electricity, would effectively consume nearly $2 billion of ratepayer subsidies that could otherwise be spent on more productive investments in renewables and emissions reduction.

The imminent closure of FitzPatrick next year means that only one of the state's six reactors – Nine Mile Point 2, which generated 6.5% of statewide electricity in 2014 -- would be online in 2030. The proposed nuclear tier would, in effect, expend potentially billions of dollars on subsidies, while only resulting in one nuclear reactor remaining online and presumably still requiring additional renewables and efficiency to displace fossil fuel generation.

Nuclear Eligibility Criteria

We are disconcerted by Staff's lack of attention to another major weakness in the Clean Energy Standard: the eligibility criteria for the nuclear tier. As detailed herein, the rationale for the nuclear tier are the following:

- That reactor closures endanger the state's ability to meet its 2030 emissions target.
- And, further, that reactor closures would result in interim emissions increases that would be best to avoid
- Neither rationale has been demonstrated, nor even fully evaluated by Staff. And worse, while both premises may prove to be incorrect, our analysis shows that the former certainly is, and the latter can be substantially mitigated. What is more, all of these reactors are eventually going to close, and the question of interim emissions increases would arise at whatever times that occurs.

However, should the Commission promulgate the Clean Energy Standard with the nuclear tier on the basis of the proffered rationale, the eligibility criteria appear to lack a legal basis. Half of the other reactors in the state that would qualify for the nuclear tier are closing before 2030, and another reactor is closing even before the nuclear tier is implemented, invalidating the 2030 emissions rationale. If managing interim emissions levels is a consideration to be addressed in the Clean Energy Standard, regardless of the 2030 target, then any zero-carbon generation source would appear to qualify for the subsidy, not just nuclear.

c. Nuclear Power is Dirty Energy and Cannot be Included in a "Clean Energy Standard"

Aside from its potential role in managing interim emissions levels, nuclear has no other environmental attributes that would justify its promotion under the Clean Energy Standard. Nuclear power is not a clean energy source. It does not qualify under any definition of renewable energy, because it utilizes a fuel source that is finite and depletable, and it entails a wide range of significant environmental impacts both within New York State and beyond its borders, upstream and downstream in its fuel chain and waste stream.

Nuclear power has major environmental justice impacts, in particular through the mining and processing of uranium for reactor fuel and in the storage of radioactive waste. Uranium mining and milling operations are disproportionately located in Native American communities, and generate massive amounts of radioactive and chemical wastes. The mass balances in just the first two stages of uranium extraction -- mining and milling -- generate on the order of 25,000 pounds of radioactive and toxic waste for every pound of enriched uranium fuel that goes into a reactor.[32]

The primary waste products at these stages are waste rock, mining solution leachates, mill tailings solids, and mill tailings liquids, all of which are typically stored above ground in the open air, in poorly managed piles and ponds. Radioactive gases and dust contaminate local communities, and groundwater sources become contaminated. These problems tend to increase over time, because most uranium mining in the U.S. is governed by a nineteenth century mining law that does not require closed mines to be reclaimed or cleaned up. The U.S. EPA has compiled a registry of over 15,000 abandoned uranium mines throughout the country,[33] but there are currently no plans and insufficient funding to support a meaningful cleanup program, effectively leaving Native American communities without protection.

Similarly, Native American and communities of color are disproportionately impacted by downstream radioactive waste storage and disposal. The country's largest low-level radioactive waste dump, historically, is in Barnwell, SC, a 46% African-American community. The proposed Yucca Mountain high-level waste repository is on Native American land belonging to the Western Shoshone's traditional territory. The more than 40% Latino communities in the New Mexico-Texas border region are affected by several nuclear facilities: a uranium enrichment plant in Eunice, NM (Louisiana Energy Services); a low-level radioactive waste dump and proposed high-level waste storage site at Waste Control Specialists, in Andrews County, TX; and the Department of Energy's Waste Isolation Pilot Project (WIPP) in Carlsbad, NM. The continued operation of New York's reactors will impact these environmental justice communities through the generation and disposal of radioactive waste.

Nuclear reactors are also the most water-intensive power sources in the world. The state has recognized this problem with respect to Indian Point, which is not only the largest industrial consumer of water in the state, it uses up to 2.5 billion gallons of water today from the Hudson River -- more than twice the amount of water that New York City and its 8.5 million resident consume -- while destroying more than one billion aquatic organisms and impacting two endangered species of sturgeon. The plant discharges 30 billion BTU of heat into the Hudson River every hour, further impacting water quality and fish populations. The four other reactors in New York consume even more water and have adverse impacts on Lake Ontario. Three of them use once-through cooling systems, with total consumption and thermal

[32] WISE Uranium Project. Nuclear Fuel Materials Balance Calculator. http://www.wise-uranium.org/nfcm.html
[33] U.S. Environmental Protection Agency. Abandoned Mine Lands Portal. http://www.abandonedmines.gov/wbd_um.html

discharges approximately equal to Indian Point. The fourth reactor, Nine Mile Point 2, utilizes an air-draft cooling tower, which effectively mitigates aquatic life and thermal pollution through large evaporative losses of drinking water from Lake Ontario. While the DEC has not determined that these reactors' operations violate environmental standards as Indian Point does, there is no doubt that their continued operation has an adverse impact on the environment and the ecology and water quality of Lake Ontario will be improved as they cease operations.

Furthermore, the continued operation of reactors in New York entails four other major environmental impacts:

1. **Risk of nuclear disasters.** The continued operation of reactors increases the risk of a major radiological disaster, as have occurred at Three Mile Island, Chernobyl, and Fukushima Dai-Ichi. The three boiling water reactors in Oswego County are all of similar design to the Fukushima reactors that melted down and exploded in 2011. These reactors have a flawed containment system that is especially prone to failure, leading to massive releases of radiological material. The impact of an accident at any of the four upstate reactors would have devastating and far-reaching impacts on New York State and Lake Ontario, far exceeding any projected benefit from their continued operation.
2. **Generation and storage of irradiated nuclear fuel**, adding to the more than 3,500 tons already stored at the reactor sites, predominantly at high-density in vulnerable storage pools located outside of containment.[34] The pools at the three boiling water reactors in Oswego County, Nine Mile Point and FitzPatrick, are located six to seven stories above ground, and are exceptionally vulnerable to attack or sabotage. Due to federal inaction to address the vulnerability of high-density pool storage, this danger will not be addressed until after a reactor has permanently ceased operations.
3. **Releases of radioactive effluents and emissions**. Fission and activation products, including tritium, are regularly discharged to the environment through the routine operations of reactors, and increase during periods of refueling outages when reactor vessels and secondary containments are opened up to accommodate fuel transfer and loading. Recent research has documented increased rates of leukemia within five kilometers of reactor sites, potentially due to ingestion of tritium and other radioisotopes through these pathways.[35]
4. **Deferral of decommissioning and site remediation.** The longer reactors continue to operate, the more contaminated the site and plant facilities become, creating more waste and contamination that must be managed and cleaned up later. Furthermore, environmental contamination, particularly groundwater contamination, cannot be effectively mitigated and remediated until the reactor is no longer operational.

For these reasons, it is manifestly inappropriate for nuclear generation to be included in the Clean Energy Standard. It not only makes a mockery of the term "clean," but could undermine the state's ability to establish policies favoring energy sources with the least environmental impact.

[34] Alvarez, Robert. Spent Nuclear Fuel Pools in the U.S.: Reducing the Deadly Risks of Storage. Institute for Policy Studies. May 2011.
[35] Fairlie, Ian. A hypothesis to explain childhood cancers near nuclear power plants. Journal of Environmental Radioactivity. Volume 133. July 2014. http://www.sciencedirect.com/science/article/pii/S0265931X13001811

3. Nuclear Zero Emission Credits (ZECs)

The creation of Nuclear Zero Emissions Credits will force consumers to pay above-market rates for electricity from nuclear plants, under the premise that customers are getting some non-energy value from nuclear plants that they don't get from other electricity sources.

Yet, the Commission and Staff have not stated exactly what benefits the ZECs are meant to capture. Nor have they acknowledged any of the hidden non-energy costs of nuclear power in creating this proposal. We cannot help but observe that in the arena of distributed energy resources, a careful weighing of costs and benefits is, in fact, underway in other parts of the Reforming the Energy Vision project, which is subject to discovery and evidentiary process as the Commission weighs exactly how to value various energy sources. Surely, this same process should be applied to nuclear power, which has enormous environmental costs and risks associated with it, and already receives substantial subsidies, almost none of which are captured in the market.[36]

If greenhouse-gas reduction is the rationale for this proposal, then at the least, the value of the ZECs should be related to the cost of carbon, not the cost of nuclear operation. Yet, nuclear operating costs seem to be the determining factor for the proposed ZEC prices. As a result, different nuclear reactors will likely offer the same "value" in terms of carbon-avoidance, yet consumers will be asked to pay different prices for the same "value" created by each reactor.

In this, we find ourselves ironically agreeing partially with Michael Twomey of Entergy Wholesale Commodities, who, at the technical conference on the nuclear tier held on March 9, 2016, argued as follows:

> "Our preference would be that there is no cost or revenue analysis at all because it really ought to be a carbon neutral, carbon free attribute and it doesn't matter if you're a wind farm or a solar array or a nuclear plant. If the objective here is to reduce carbon in the state of New York, than we ought to be trying to price or compensate those generators that serve that attribute. That's really the point."[37]

Better yet, the carbon-avoidance value should be balanced against other costs and benefits of nuclear energy. The Staff have taken no attempt to study such benefits and costs. The cost report cites only reports performed for or by proponents of nuclear energy as the source for claiming that the upstate nuclear reactors will $928 million - $1.08 billion in benefits over the next 5 years.[38] The Staff make no effort to perform its own analysis or cite any other source, whether by a less biased actor or by nuclear opponents. Additionally, Staff make no effort to even acknowledge, much less quantify, the various

---

[36] Koplow, Doug. Nuclear Power: Still Not Viable without Subsidies (2011). Union of Concerned Scientists. February, 2011. http://www.ucsusa.org/assets/documents/nuclear_power/nuclear_subsidies_report.pdf

[37] Transcript of the March 9, 2016 Technical Conference. Pg. 35. http://documents.dps.ny.gov/public/Common/ViewDoc.aspx?DocRefId={778C7ADC-31C4-4E94-95B9-FF6826046191}

[38] Department of Public Service. April 8, 2016. "Clean Energy Standard White Paper–Cost Study" Pg. 84 http://documents.dps.ny.gov/public/Common/ViewDoc.aspx?DocRefId={7B564AD9-E6E9-4FA9-93B6-1AA85B1719E2}

costs associated with nuclear power. These include the environmental and health impacts in mining and milling communities outside of New York, as well as in reactor host communities in New York.

Further, if the cost of carbon-avoidance is the value that consumers are paying for with ZECs, why are ZECs only applicable to nuclear reactors? There are many other carbon-avoidance technologies, most if not all of them with fewer environmental side effects when compared to nuclear energy. Shouldn't LSEs be given the same flexibility they are afforded in other tiers, to choose the lowest cost or most sensible resource that can provide that value?

4. Nuclear Eligibility

The proposed nuclear tier is designed to provide an uncompetitive blank check to one or two large out-of-state corporations. If Entergy shuts FitzPatrick as planned**, the entirety of ZECs proposed by the Staff White Paper will go to Constellation Energy Nuclear Group, the joint venture company that owns Ginna and Nine Mile Point**. In fact, once Entergy closes FitzPatrick, CENG may be the largest single owner of power generation in New York. If Entergy changes its mind or is somehow forced into keeping FitzPatrick open, that adds only one large company to the mix of eligible corporations receiving billions of dollars in ratepayer subsidies.

This is inconsistent with the "theory of tiers" arguments made by the White Paper on pages 17 and 18, which call for flexibility and competition within the tiers. The White Paper extolls the benefits of allowing LSEs flexibility to address issues beyond their control and creating competition among renewable energy products. Yet the proposal ignores those same values when it comes to the design of the nuclear tier.

The ZEC proposal design is also inconsistent with New York's commitment to competitive markets. While we oppose the nuclear inclusion of the Clean Energy Standard outright, we argue that if nuclear plants are to be included, this inclusion must be done in a way that fosters competition and market fairness. The Commission must at least ensure nuclear power must compete in a tier with other zero-emissions resources. Why shouldn't LSEs be allowed to purchase energy efficiency and/or renewables instead of nuclear power, if doing so is cost-effective for consumers, and achieves identical carbon-avoidance.

The nuclear owners have argued that the market doesn't fairly compensate them for the benefits they provide. (We argue the market doesn't properly charge them for the environmental destruction they create.) Yet the Staff Proposal goes beyond creating a level playing field for nuclear power and instead completely insulates reactors from any market forces or competition.

The nuclear tier proposal creates a program in which reactors neither compete with each other for ZECs nor compete with other resources. By proposing a number of ZECs roughly equal to the number of nuclear megawatt hours expected to be generated by eligible nuclear plants, the Staff proposal guarantees ZECs to any unprofitable nuclear operator that wants them, regardless of cost. This is also an artifact of the anti-competitive nature of the nuclear tier proposal: nuclear tier targets have been designed to accommodate specific power plants in a particular schedule of economic duress:

- Ginna and FitzPatrick beginning in April 2017, whose rest-of-year generation would add up to approximately 7,500 GWh
- Ginna and FitzPatrick in 2018, with annual generation of ~10,000 GWh.
- Ginna, FitzPatrick and Nine Mile Point 1 in 2019, with annual generation of ~15,000 GWh.
- Ginna, FitzPatrick, Nine Mile Point 1 and 2 in 2020, with total annual generation of ~25,000 GWh.

And by setting the price of ZECs equal to the going-forward costs of the unprofitable nuclear plants, adjusted based on annual filings with the commission, the Staff proposal ensures that nuclear reactors will never be priced out of the market, regardless of how high their costs soar.

5. Tier 3 Alternative Compliance Mechanism

How much money is the Governor and the Commission willing to charge New Yorkers for to support nuclear reactors? So far, the answer seems to be whatever it takes to keep them from closing. At some point, the costs of promoting and bailing out nuclear reactors will surpass the supposed benefits of keeping them open, if they haven't already. We argue that time has come. The losses at Ginna and FitzPatrick are so great that the $60-80 million per year in subsidies they require to continue operating could easily cover property tax replacement, worker transition funds and retraining, as well as replacement with energy efficiency and wind.

Yet the Staff proposal does nothing to constrain costs for consumers because it contains no real alternative compliance mechanism for the nuclear tier. Instead, costs will presumably be whatever it takes to keep the nuclear plants from closing, regardless of cost. The only constraint is that the companies will have to open their books and prove that the costs they claim must be covered by the ZECs are legitimate.

Given the escalating costs of nuclear reactors and the prospect of expensive equipment breakdowns, this is little comfort. The Commission should let consumers cut our losses on nuclear now, not set us up to throw good money after bad for years to come.

By setting up the nuclear tier to be an uncompetitive tier, the Commission is also leaving no Plan B available for utilities to find carbon-reductions elsewhere or pay alternative fees if the costs of nuclear go too high.

C. The Role of Long-Term Contracting Mechanisms

As detailed in other sections of these comments, AGREE and NIRS support the use of bundled long-term power purchase agreements for the procurement renewable energy.

D. Targets for Each Tier through 2020

AGREE and NIRS support higher targets for renewable energy in Tier 1. Overall, we see the goals of the Clean Energy Standard are conservative and we urge the Commission to set higher targets through 2030. We also urge the Commission not to backload the development of renewable energy, by setting lower targets in near-term years and higher targets in later years. As much as possible the Commission should set the tier targets so as to maximize the use of the federal tax credits available for wind and solar.

AGREE and NIRS oppose the inclusion of the nuclear tier at all. If a nuclear tier is ultimately included in the Clean Energy Standard policy, care should be taken to ensure that they are extremely temporary and that there is a plan for phasing out nuclear reactors while replacing them with energy efficiency and renewables. This could be accomplished by setting declining megawatt hour targets for Tier 3, rather than inclining ones. This would signal to the market that New York does not intend to establish a permanent, uncompetitive nuclear subsidy, and provide nuclear companies and communities a signal to plan for closure.

E. Program Implementation

The implementation schedule proposed by Staff appears extremely ambitious, particularly in the context of the other complex and numerous policy proceedings within the Reforming the Energy Vision process. AGREE and NIRS are eager to see a binding Renewable Portfolio Standard in place in New York, but we urge the Commission to set up a process that provides sufficient time to work through the complexities of the program and give parties enough time to comment.

III. Conclusion

For all the reasons stated above, we urge the Commission to enact an enforceable Clean Energy Standard with the following characteristics:

- No nuclear tier and no subsidies for nuclear power
- Higher overall renewable energy targets and no backloading of targets into later years
- Long-term bundled power purchase agreement to drive down costs
- Enforceable and aggressive energy efficiency targets
- The inclusion of an offshore wind tier
- A commitment to energy affordability and equitable rates
- A priority on locally own and community owned renewables and a requirement to purchase RECs from within the State of New York

We appreciate the opportunity to make these comments to improve this much needed Clean Energy Standard policy.

Respectfully submitted,

/s/
Jessica Azulay Chasnoff
Program Director
Alliance for a Green Economy

/s/
Tim Judson
Executive Director
Nuclear Information and Resource Service

Dated: April 22, 2016

Appendix A
Analysis of Renewable Energy Potential and NYS Emissions Targets

The New York State Department of Public Service ("DPS") has proposed a mechanism for subsidizing uncompetitive nuclear power plants as part of the state's Clean Energy Standard program (CES). While nuclear would not count toward the 50% renewable energy standard that is the primary purpose of the CES, DPS proffers the rationale that preventing the closure of nuclear reactors is necessary to meet the state's emissions target of 40% reductions by 2030, in parallel to the renewable energy goal. Unfortunately, DPS has not provided any supporting analysis to illustrate the role nuclear plays with respect to greenhouse gas emissions or the state's decarbonization strategy.

In our comments on the CES, we express our strong support for the renewable energy and carbon emissions targets, but we question the provision for subsidizing nuclear. We also detail concerns about DPS's underestimation of renewable energy and efficiency growth under the CES between 2017 and 2030. Even with these flaws, it has not been demonstrated that preventing the closures of uncompetitive nuclear generation is necessary to meet emissions targets. Nevertheless, we feel it important to examine this issue in greater depth to inform our comments and the rest of the proceeding.

We therefore performed an analysis of a bounding case in which there is no nuclear generation online in New York in 2030, taking into account the state's renewable energy and efficiency potential, the implications for the statewide energy mix by 2030, emissions reductions measures in other sectors, and the prospects for meeting New York's parallel renewable energy and emissions goals.

Energy Efficiency by 2030

In our comments, we detail our concerns about New York's energy efficiency performance and its implications for the CES and emissions policies. We make a recommendation that the state adopt aggressive and enforceable efficiency standards in concert with the CES. For the purposes of this analysis, we modeled net efficiency rates based on increasing New York's electricity energy efficiency performance by 1.0% and 1.5% above historical levels. On average, New York has trailed leading states by 1.32% per year, with the gap widening over the last three years. The rates below represent a scenario to narrow the gap and put New York's electricity efficiency programs in line with those of the leading states.

We use a historical net efficiency performance figure of 0.634% based on our analysis of New York energy loads from 2005-2014, provided in the New York Independent System Operator 2015 Gold Book.[39]

This yields average net energy efficiency rates of 1.634% and 2.134%, which we apply on a compounding basis from 2017 to 2030, from a 2014 base year adjusted by the historical efficiency rate (0.634%) for the 2015-2016 period.

[39] New York Independent System Operator. 2015 Load and Capacity Data: "Gold Book." April 2015.

Efficiency Rate	2014 Base Year Load (GWh)	2016 Load (GWh)	2017-2030 Efficiency Gains	2030 Load (GWh)
Trend + 1.0%	160,059	158,036	32,976	**125,060**
Trend + 1.5%	160,059	158,036	41,727	**116,309**

Net load reductions under this model are greater than the amount of nuclear generation proposed to be included in the nuclear tier. DPS's 2030 load projection of 150,017 includes an estimate of load growth due to electrification of transportation and heating, in the amount of 8,615 GWh. Converting transportation and heating from fossil fuels to electricity must play a vital part in the state's decarbonization strategy and we also take it into account in our analysis.

Transportation

The New York State Energy Plan ("SEP") notes that vehicular ground transport totaled approximately 130 billion vehicle miles traveled ("VMT") in 2012.[40] The SEP does not include a comparable projection for 2030, but it does project a 25% reduction in transportation sector emissions. We modeled transportation sector emissions and electricity load at varying levels of electrification, as well as efficiency increases for fossil fuel powered transportation. We project the latter equivalent to increasing from a 25 mpg CAFE standard to 45 mpg (44%). For electrification, we use a VMT to load conversion factor of .42 kWh/mile.

Electrification Rate	VMT Converted (billions)	Electricity Load (GWh)	Fossil Fuel %	2030 Emissions (MMt CO2e)
5%	6.5	**2,730**	95%	**37.88**
15%	20	**8,190**	85%	**33.90**
25%	33	**13,650**	75%	**29.91**
50%	65	**27,300**	50%	**19.94**

Under these models, emissions from transportation could be reduced by 47%-70% from 2011 levels (71.78 MMt), and 37%-66% from 1990 levels (60.74 MMt).

Space Heating

We factor in a 30% increase in energy efficiency for commercial and residential heating statewide, through building envelope, insulation, construction and building performance standards, and other energy loss reduction measures. We also project converting 30% of space heating systems to efficient electricity-powered heat pump systems, which typically operate about 30% more efficiently on average than fossil fuel furnaces and boilers. Then we convert the corresponding fuel combustion to electricity load at the standard 33% efficiency rate of thermal power generation.

Sector	2011 Total Energy (TBtu)	Fossil Fuel Share	2011 Emissions – Non-Electricity (MMt CO2e)	Load Converted (GWh)	2030 Emissions (MMt CO2e)
Residential	1,141	47%	31.37	**8,200**	**17.25**
Commercial	1,266	34%	24.27	**6,600**	**13.35**
TOTAL	2,407	--	55.64	**14,800**	**30.60**

[40] New York State Energy Planning Board. 2015 New York State Energy Plan. Vol. 2. End-Use Energy. Page 72.

Under this model, emissions from direct combustion of fossil fuels in the residential and commercial sectors would be reduced about 45% from 2011 levels (55.64 MMt), and 50% from 1990 levels (60.68 MMt).

Renewable Energy Growth
We project achievable levels of renewable energy between now and 2030, driven by supporting policies under the CES designed to drive affordable growth in four principle technologies.

On-Shore Wind – 6,800 MW
This is comprised of 800 MW of projects between 2016-2020, followed by an average annual rate of deployment of 600 MW year from 2021-2030. That rate of growth has been achieved by New York in the past (mid-2008 to mid-2009) and is regularly achieved in other states. It amounts to deploying 120-330 new turbines per year, depending on the size of the turbine – also well within demonstrated state-level construction rates.

Off-Shore Wind – 5,000 MW
This is roughly half as much offshore wind as was deployed in Europe over a period of about 10 years. It is partially but not entirely contingent on the PSC adopting proposals for an off-shore wind tier in the CES, and could be supported by PPA solicitations like the one being contemplated by the NYC government. Proposals for up to 1,700 MW of off-shore wind are already being contemplated, and could be deployed much sooner than the 720 MW projected by NYSERDA (2028-2030):

- Rockaways/Staten Island NYPA 700 MW
- Eastern Long Island Deepwater Wind 1,000 MW

These projects could be deployed within six years (2022). Deploying 400 MW per year thereafter (40-80 turbines per year) would result in 5,000 MW of offshore wind in 2030.

Utility-Scale Solar PV – 5,000 MW
This is consistent with projections in the Supplemental Environmental Impact Statement, which range from 3,721 MW to 9,122 MW for the various load and financing scenarios. It equates to an average growth rate of 360 MW/year over the period covered by the CES. That rate is well within yearly growth figures projected by in the cost analysis, but results in about 30% more total capacity because we project steady growth rather than the sporadic growth pattern in NYSERDA's model.

Distributed Solar PV (Residential and Commercial/Industrial) – 8,000 MW
We project continued growth in distributed solar PV untethered from the NY-Sun program. This is due to behind-the-meter solar's continued declining costs, attractiveness as a source of onsite generation, its value to homeowners and businesses in providing resilience and reliability, and its utility as part of bundled energy services with storage, efficiency, and other energy products and services. We include 3,000 MW of distributed solar PV under NY-Sun, plus another 500 MW/year from 2021-2030. That rate of deployment is consistent with NYSERDA's 2019 projection under NY-Sun.

Resource	New Capacity (MW)	Capacity Factor	2030 Generation (GWh)	Derated Capacity (MW)
On-shore Wind	6,800	35%	**20,849**	816
Off-Shore Wind	5,000	45%	**19,710**	1,900
Utility Solar PV	5,000	14%	**6,132**	2,080
Distributed Solar PV	8,000	13%	**9,110**	2,970
TOTAL	24,800		**55,801**	7,716

When added to the existing amount of renewable energy generation cited in the white paper (41,600 MWh), this would result in a total of 97,400 GWh of renewable generation in 2030.

2030 Electricity Resource Mix – Efficiency and Electrification Scenarios

Using the above estimates, we calculated the energy mix in 2030 with a bounding condition involving zero nuclear generation. For the purposes of these projections, we assume that expensive coal and petroleum-fired generation has been phased out and all fossil fuel electricity generation is from natural gas-fired power plants (even as gas declines in other sectors). We also assume that other dirty generation sources, like trash incineration, have been phased out. We consider the latter outcome desirable, but also of little consequence to the statewide energy mix since such sources are currently a small part of New York's energy supply.

2030 Net Load Scenarios

Efficiency Scenario	Pre-BET Load (GWh)	Heating Additions (GWh)	Transport Additions (GWh)	Total Additions (GWh)	2030 Adjusted Load (GWh)
1. Trend + 1.0%	125,060	14,800	**A.** 2,730	17,530	**142,590**
			B. 8,190	22,990	**148,050**
			C. 13,650	28,450	153,510
			D. 27,300	42,100	167,160
2. Trend + 1.5%	119,309	14,800	**A.** 2,730	17,530	136,839
			B. 8,190	22,990	**142,299**
			C. 13,650	28,450	**147,759**
			D. 27,300	42,100	**161,409**

2030 Electricity Resource Mix Projections

Based on the range of net load scenarios above, we selected three load scenarios that are representative of the ranges above:

142 TWh: corresponding to scenarios 1.A. or 2.B. in the table above (coded in yellow) – lower Energy Efficiency and 5% Electric Vehicles **or** higher Energy Efficiency and 15% Electric Vehicles

148 TWh: corresponding to scenarios 1.B. and 2.C. (in blue) – lower Energy Efficiency and 15% Electric Vehicles **or** higher Energy Efficiency and 25% Electric Vehicles

161 TWh: corresponding to scenario 2.D. (in green) – higher Energy Efficiency and 50% Electric Vehicles

Based on those projections, we modeled representative electricity mixes in 2030 with our renewable generation projection and total fossil fuel generation, adjusted for each load scenario.

Energy Source	2014 Generation (TWh)	2030 Generation (TWh)			2030 Share			Change		
Fossil Fuels	73	45	51	64	**32%**	34%	**40%**	-38%	-30%	-12%
Nuclear	46	0	0	0	**0%**	0%	**0%**	-100%	-100%	-100%
Renewables	42	97	97	97	**68%**	66%	**60%**	230%	230%	230%
Total	**161**	**142**	**148**	**161**						

In all scenarios the state both surpasses the 2030 renewable energy target and reduces electricity sector emissions without nuclear, while surpassing the amount of electrification of transportation and heating projected in the white paper. Even in the highest load scenario – corresponding to 50% Electric Vehicle penetration and 30% heating conversion – fossil fuel generation decreases by over 12% from 2014, with no nuclear generation in the mix. Under the low Electric Vehicle ("EV") scenario, 2030 fossil fuel generation would be reduced 38% from 2014 levels. The former corresponds to a 66% reduction from 1990 in transportation sector emissions; the latter to a 37% decrease.

2030 Emissions Projections

We selected the two bounding cases from the electricity resource mix table above, corresponding, respectively, to lower electricity load and higher EV penetration. We modeled no decrease in industrial emissions due to uncertainty in the level of manufacturing and the sector's energy use. We modeled 30% reductions in Other Sources, which includes waste water treatment, solid waste, natural gas leakage, and agriculture.

Sector	1990 Emissions (MMt CO2e)	2011 Emissions (MMt CO2e)	2030 Emissions Low Load	2030 Emissions High Load
Transportation	60.74	71.78	37.88	19.94
Residential	34.17	31.37	17.25	17.25
Commercial	26.51	24.27	13.35	13.35
Industrial	20.01	11.54	11.54	11.54
Energy Production	64.62	42.50	26.20	37.26
Other Sources	24.71	30.28	21.20	21.20
TOTAL	**230.76**	**211.74**	**127.42**	**120.54**
Reduction from 1990		8.2%	**44.8%**	**47.8%**

In both scenarios, it is possible to surpass the statewide emissions goal of 40% from 1990 by 2030, without any nuclear generation. The modeled electricity load scenarios involve two to five times as much load growth from electrification of transportation and heating as was modeled in the white paper. The scenario with higher electricity load and greater electricity sector emissions results in the deeper overall emissions reduction. This suggests that, while reducing electricity sector emissions is helpful in meeting the 2030 emissions goal, reducing emissions in other sectors, principally transportation and heating, is far more important.

It is also clear that, while a multi-pronged strategy will be most effective in reducing emissions and expanding renewables, nuclear generation need play no role. Should Nine Mile Point 2 remain in

operation in 2030, the modeled emissions reductions would increase by an additional 3%. However, at that time, the reactor would be the only conventional baseload power plant left on the New York grid.

The choice to support nuclear generation under the CES may detract from other parts of this strategy, by diverting much-needed economic resources from innovation and the transformation of the state's energy infrastructure. Maintaining aging and increasingly anachronistic infrastructure that is incompatible with the flexible and responsive technologies could be an obstacle to the deep decarbonization of the state's energy system.