

Potential New Carbon Pricing in the NYISO Market

Analysis Group's Final Report – Opportunity for Stakeholder Feedback

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Agenda for today's stakeholder meeting

- **Review of the Report's findings—with opportunities for questions and comments on the report from stakeholders**
- **Review of the Report's analyses—with opportunities for questions and comments on the report from stakeholders**

Review of the Report's key findings: More opportunities for questions & comments from stakeholders

The premise for the final report

- **The focus is on how New York can best accomplish its goals and meet the Act's mandates for reducing GHG emissions in its power sector and its broader economy.**
- **The Report examines how NYISO's proposed carbon-pricing mechanism can help the State meet its new statutory requirements more broadly, efficiently, and effectively.**

Key findings of the report

Summary for Policy Makers (1)

- **New York has the strongest set of climate policies in the U.S.**
 - The new Climate Leadership and Community Protection Act mandates that the electric system rely on renewables for 70% of supply by 2030 and on zero-emitting resources for 100% of supply by 2040.
 - The Act sets the goal of reducing manmade GHG emissions by 100% (over 1990 levels) by 2050.
- **New York State has long been a policy leader.**
 - The CLCPA is the newest chapter in New York's economic, clean-energy and environmental leadership, with the potential to make a difference in policy adoption in other regions and in reducing global GHG emissions.
- **Achieving the goals of the CLCPA will not be easy.**
 - Given the unprecedented efforts that will be required to meet the mandates of the Act, New York should use every effective tool available—including harnessing the state's wholesale power market—to get the job done and to do so in the most efficient, innovative, lowest-cost way.

Key findings of the report

Summary for Policy Makers (2)

- **The Act envisions using an array of measures, put in place as soon as possible.**
 - In addition to the types of policies New York has used for many years—including long-term contracting for RECs and ZECs, energy-efficiency programs, environmental mandates (such as the Peaker Rule)—many more actions will be needed to get the job done in a timely and effective way.
- **The Act assigns a big role for the electric sector to help lower carbon from the economy as a whole.**
 - Achieving the CLCPA’s goals will require an electric system that provides power as reliably and as affordably as possible as it grows to transition other sectors’ energy uses to electricity (i.e., through “beneficial electrification”).
- **A carbon-pricing mechanism in the NYISO market is a home-grown policy instrument that can help New York meet its climate goals at lowest cost.**
 - NYISO can unleash the power and creativity of market forces through incorporating a pricing mechanism into the state’s wholesale power market.

Key findings of the report

Summary for Policy Makers (3)

- **A NYISO carbon price can help deliver New York’s clean-energy transition in faster, cheaper, more reliable, more efficient, and more creative ways—even though it is hard to predict exactly how those changes will occur.**
 - Just as it is hard to predict the economic benefits to New Yorkers of addressing climate change by reducing GHG emissions, it is also hard to predict the costs of mitigating it, whether through a carbon price in wholesale markets and/or through other policy mechanisms.
 - A carbon price will send price signals to investors, entrepreneurs and project developers (and to customers) that carbon-reduction matters. It will help spur innovative solutions, add transmission capacity between upstate and downstate regions, locate resources in downstate areas, reduce emissions from fossil units that affect vulnerable communities, and invest in retention of new and existing zero-carbon resources.
 - Market efficiency gains from embedding a price on carbon into NYISO’s energy market are conservatively estimated to be \$280-\$850 million (net present value, 2019\$, 2022-2040).

Key findings of the report

Summary for Policy Makers (4)

- **A carbon price in NYISO's market will position private actors to row in the direction of the state's climate goals.**
 - Given the breadth and depth of the transitions anticipated by the CLCPA, NYISO market participants' decisions should be aligned with the goals of reducing carbon emissions.
- **A carbon price in NYISO's market creates synergy between the wholesale power market design and the Act's goals.**
 - The state's competitive wholesale power market depends upon transparent price signals reflecting electric-system conditions and system needs. To assist the state in its energy transition, the NYISO market design needs to send signals that low-carbon resources provide value to the system and to help stimulate entry of such resources (and storage) at a pace that is much faster than New York has ever seen.
- **A carbon price can work hand in hand with other policies in New York.**
 - It can amplify innovation in clean-energy products and services, help to reduce air pollution and improve public health outcomes, support investment in advanced energy infrastructure, lessen risk of FERC action to mitigate New York's wholesale capacity market, and address leakage of carbon emissions to neighboring regions.

Key findings of the report

Summary for Policy Makers (5)

- **There will be out-of-pocket costs to transition New York's energy economy, and a price on carbon in NYISO's wholesale market will help keep these costs lower than they otherwise will be.**
 - Because the Act is so new, the prior studies that have modeled consumer cost impacts do not reflect the timing and depth of changes that will be needed in the electric system.
 - The various studies indicate that a carbon price will lead to billions of dollars of positive economic benefits:
 - RFF's 2019 study indicates that global social welfare benefits fall in the range of \$118-\$755 million/year (2019\$).
 - Using Potomac Economics' results, we estimate that NY consumers will see NPV benefits of \$1.7-\$3.2 billion (2019\$, 2022-2036)
 - Using Brattle's results, we estimate NPV benefits to consumers of \$119-\$605 million (2019\$, 2022-2036).
 - The New York Power Authority will also receive revenues (estimated to be ~\$300-\$400 million/year (as of 2025) that can be used for public benefit.
 - Powering more of New York's economy on electricity will help to lower the costs of reducing carbon, as compared to more directly reduce GHG emissions in buildings' and vehicles' energy use.

Review of the results of the Report's findings: More opportunities for questions & comments from stakeholders

Implications of the Act for entry of renewables and zero-carbon resources

The challenge: Ramping up clean energy resources in the NYISO system to meet the CLCPA targets

- **The CLCPA calls for 70% renewables by 2030 (11 years from now)**
 - In 2018, renewables = 20% of supply (with 80% of that amount from existing hydroelectric supplies)
 - Even given the growth of wind and solar resources in the past 10 years, these resources still provide only 5% of total supply in 2018 and will need to ramp up in unprecedented ways in the next decade.
 - Assuming that all existing, already procured and announced renewable projects come on line as expected, they will account for 42% of baseline demand forecast as of 2030.
 - NY will need to add another 28 percentage points of renewables to meet the 70% target. This is 127% more than the resources under long-term REC contracts combined with the technology-specific targets in the CLCPA.
- **The CLCPA calls for 100% zero-carbon supply by 2040 (21 years from now)**
 - If the existing nuclear units with scheduled retirement dates before 2040 close down by then, the Act's requirements will be very challenging, even if the renewables enter the market to meet the 70% target by 2030.
 - Assuming that 4 nuclear units retire before 2030, the technology-specific resources targeted in the Act will simply replace this nuclear generation, rather than help to make progress toward the CLCPA targets.

Implications of the Act for entry of renewables and zero-carbon resources

The numbers: Clean energy resources in NYISO system v. CLCPA targets for the power sector

	2018		2030		2040	
	%	GWh	%	GWh	%	GWh
Baseline demand forecast	-	158,445	-	153,400	-	165,200
Renewable resources						
CLCPA Target ²	-	-	70%	107,380	-	-
Known/planned resources ¹	20%	32,338	42%	63,700	52%	85,300
Additional resources to be identified	-	-	28%	43,680	18%	30,340
Zero-carbon resources						
CLCPA Target ²	-	-	-	-	100%	165,200
Known/planned resources ¹	60%	94,744	70%	108,000	75%	123,400
Additional resources to be identified	-	-	-	-	25%	41,800

Much-higher electrification scenarios will require significantly more renewable and zero-carbon resource additions.

1. Reflects all existing, already procured and planned resources in NYS, including those forecasted by NYISO in the 2019 Gold Book, procured through NY's Clean Energy Standard (2017-2019), or announced as part of the specific/concrete technology-specific targets in the NLCPA.

Other notes and information sources are in the Final Report; assumptions are in the Technical Appendix

Implications of the Act for entry of renewables and zero-carbon resources

Framing the cost issue

- **The cost implications on this transition are large, even if the economic benefits to New Yorkers make it worth it.**
- **Without a carbon-pricing mechanism in the NYISO energy markets, there will likely be:**
 - Above-market costs for many if not most of these resource additions.
 - Slower entry of such resources.
 - Relatively weak price signals for retirement of inefficient/high-emitting resources, for entry of clean resources, and investment to maintain operations of existing zero-carbon supplies over the long term.
 - More resources under long-term REC and ZEC contract, increasing the share of out-of-market resources.
 - More leakage of GHG emissions to neighboring regions.
 - Less incentive for expanding transmission between upstate and downstate NY and for adding clean resources in downstate NY.

Implications of the Act for entry of renewables and zero-carbon resources

Framing the cost issue

- **We estimate market efficiency benefits associated with internalizing a carbon price into the NYISO markets:**
 - The full build-out of the electric system to meet the targets in the Act will be expensive, with significant dollars in above-market costs (in a wholesale power market that does not include the carbon-pricing mechanism).
 - We estimated such above-market costs to build out the system (using technology-based cost and performance assumptions for new renewable resource additions under alternative portfolio assumptions, and Brattle's forecasts of long-term wholesale prices without a carbon tax).
 - The literature on organized wholesale markets indicates a 1%-3% efficiency improvement in the overall capital and operating costs of the wholesale electric system.
 - Applying that range of market efficiency benefits to the above-market cost analysis, we estimate a benefit to New York consumers in the range of \$280-\$850 million NPV (2019\$, 3% discount rate) for a baseline scenario.

Impacts related to potential broader FERC mitigation

Risks associated with relying principally on out-of-market actions to transition the electric system

- **We observe the questions raised by FERC with regard to out-of-market resources supported by state policies.**
 - We discuss the various market-mitigation approaches that FERC has adopted for NYISO, PJM and ISO-NE.
- **Without knowing what FERC might do with regard to any expansion of market mitigation in NY, we examined the cost implications if FERC were to expand mitigation in NY if the State were to continue to rely on long-term contracts as an increasing share of the wholesale market.**
 - REC and ZEC contracts accounted for 20% of generation as of 2018.
 - If all of the renewables needed to enter the market by 2030 were under long-term REC contracts, then NYSERDA REC and ZEC contracts would account for 50-60% of total generation by 2030.
- **We estimated potential market-mitigation costs under various scenarios (e.g., expansion of NYISO's Buyer-Side Mitigation to the Rest of State; elimination of the 1,000 MW exemption for renewables; application of a PJM-like approach), and identified significant cost risk to electricity consumers in New York.**
- **Implementing a carbon price within NYISO's markets would reduce the risk of BSM costs to NY consumers.**

Impacts on consumers' electricity costs and social welfare

Long-term costs and benefits from introducing a carbon price in NYISO markets

- **There have been no studies of the cost of implementing the Act, nor of the costs to consumers of a implementing a carbon pricing mechanism in the NYISO markets with the goals articulated by the CLCPA.**
 - The studies by the Brattle Group (2018) and Potomac Economics (2019) do not reflect the aggressive targets of the Act
 - Their results leave the false impression that a carbon pricing mechanism will lead to near-term consumer price impacts whereas meeting the targets of the CES (previously) and the Act will not.
 - Using their results, we have estimated NPV benefits to consumers of a implementing a carbon pricing mechanism for the period of 2022-2036, using 3% and 7% discount rates (2019\$).
 - Potomac estimate: \$1,715 million to \$3,253 million NPV
 - Brattle estimate: \$119 million to \$605 million NPV
 - Using the results of the RFF study (2019), we have estimated positive social welfare benefits (in 2019\$) of adding a carbon pricing mechanism in NYISO's market: \$118 million to \$755 million per year (as of 2025)

Other impacts

A carbon-pricing mechanism's contribution to other economic effects

- **Impacts on potential repowering and/or repurposing of sites with existing fossil generating units in NYC area.**
 - The Potomac Economics analysis indicates positive economic and emissions benefits from a carbon price.
- **Impacts on public health from air emission reductions**
 - The Brattle and Potomac modeling runs indicate positive impacts on public health, particularly in environmental justice communities.
 - Our illustrative analysis of a high electrification case in the residential sector (for fuel-switching of vehicles and heating systems) indicates net reductions in CO₂ emissions in New York State.
- **Impacts on fossil fuels used in New York State**
 - Our review of the Brattle and Potomac modeling runs indicates reductions in imports of natural gas into New York.
- **Impacts on revenues to state power entities**
 - We report others' estimates of revenues to NYPA that can be used for public purposes.
 - RFF (\$326-400 million/year in 2025 (2019\$)); Brattle (\$306 million/year in 2025).

Incremental value proposition of a NYISO carbon-pricing mechanism: Summary

Outcome	Impact of a Carbon-Pricing Mechanism in NYISO Markets
State policy leadership	Can be exported to other states and regions, supporting New York's market approach.
Speed of adoption	Can be implemented relatively quickly.
Accelerated entry of renewable projects	Will increase the opportunity for financing of clean energy resources to enter the market in the absence of a long-term REC contract.
Incentives for innovation	Will increase incentives for entrepreneurs and others to develop new supply-side and demand-side technologies, products and services.
Incentives for energy efficiency and other customer-based actions	Has the potential to improve over time price signals to consumers reflecting the full costs of using electricity, and influence consumer access to and use of demand-management technology and practices.
Incentives for efficient transmission investments	Will create strong incentives for cost-effective investment in increased transfer capability between upstate and downstate.
Acceleration of fossil retirements and reduced use of natural gas	Will put financial pressure on existing inefficient fossil units to retire and reduce use of fossil fuels, especially in downstate NY areas. It will also drive increased efficiencies in remaining fossil generation
Compatibility with other policy instruments	Can be a seamless complement to other state policies (e.g., energy efficiency, REC and ZEC contracting), by providing a means to value low-carbon investment and operations in the electric system.
Ability to harmonize policy and markets	Will internalize the cost of GHG emissions into the electric markets, and improve the performance of the wholesale market.
Alignment with wholesale market design	Will support the efficient operations of the NYISO markets.
Consumer cost impacts	Can provide an improved market design, aligned with the state's carbon-reduction goals, to produce savings to consumers.
Public health impacts	Will reduce local air pollution there in downstate New York
Impacts on disadvantaged communities	Will reduce emissions in downstate Environmental Justice areas.
Limitation of leakage of CO ₂ emissions to other regions	Will limit leakage due to the proposal's treatment of emissions related to cross-boundary electricity flows.
Revenue streams to public entities	Will increase revenues to NYPA as a power provider in the NYISO markets.

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