



Building Clean Energy in NY:
The Case for Transmission Investments

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Building Clean Energy In New York is a series of Issue Briefs published by the Alliance for Clean Energy New York. Each Issue Brief aims to provide an in-depth look at a topic critical to the successful achievement of New York's legislative mandate of 70% renewable electricity by 2030.



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I. Executive Summary

New York’s energy future will be shaped by the recently passed Climate Leadership and Community Protection Act (CLCPA), which includes ambitious clean energy goals: 70% of the electric consumption in the State is to be met by renewable resources by 2030 and 100% must be zero emissions by 2040. Much of the new renewable resources to be developed under the CLCPA are expected to be located Upstate, in less densely populated areas away from the greatest load centers, save the offshore wind and some solar resources that will be located Downstate. Under current circumstances, while Upstate electricity supply is overall lower in carbon emissions than Downstate, this Upstate renewable energy faces congestion in being physically delivered to where it is needed most. Given this “tale of two grids,”¹ there is growing recognition of the need for strategic transmission investments in the State. This investment will increase reliability, reduce congestion, and facilitate achievement of renewable energy goals most cost-effectively. In this Issue Brief, ACE NY is making recommendations to the New York Public Service Commission (Commission) to accelerate strategic transmission investments in order to realize these benefits.

Now is the time to continue the momentum behind recently approved transmission projects and accelerate the pace of upgrading transmission, by reducing the primary hurdles for new transmission projects. Over 80% of the New York State transmission system entered service before 1980. Several transmission pathways have experienced routine congestion for more than twenty years. In 2011, the Federal Energy Regulatory Commission (FERC) issued Order 1000² to drive transmission planning and this process is slowly bearing fruit in New York. Under the Public Policy Transmission Planning Process (PPTPP), two major projects have been recently approved by the New York Independent System Operator (NYISO) to increase transfer capacity as a mandate from the Commission. The Empire State Transmission Project located in Western NY and various lines collectively referred to as “AC transmission” in Central NY were selected to increase transfer capability on major interfaces. These projects are expected to be in service in 2022 and 2023 respectively. Still, they are insufficient to address the state’s lack of adequate transmission between Upstate generation and Downstate load centers.

¹ See [NYISO Power Trends 2019](#). In addition, in 2018, while 87% of Upstate New York’s energy generation was carbon-free (i.e., zero carbon emission), only about 27% of generation in Downstate New York was carbon-free, with the remainder of the generation coming from fossil fuels.

² United States Federal Energy Regulatory Commission. *Order No. 1000: Transmission Planning and Cost Allocation by Transmission Owning and Operating Public Utilities*. FERC 18 CFR Part 35, Docket No. RM10-23-000. Issued July 21, 2011. <https://www.ferc.gov/whats-new/comm-meet/2011/072111/E-6.pdf>



The CLCPA cannot succeed cost-effectively without New York State taking concrete steps to facilitate and support the development of transmission projects, with both public and private sector sponsors, to deliver energy that is already being curtailed and new generation that will be needed to satisfy the CLCPA mandates. The consequences of inaction or undue delay will be that New York will fail to meet its ambitious clean energy goals on time or at least cost. ACE NY respectfully submits the following recommendations to the Public Service Commission:

1. **Identify several specific no-regrets upgrades in the current PPTPP.**
2. **Identify a generic Public Policy Transmission Need related to renewables** to proceed on a simultaneous and parallel track within the current PPTPP.
3. **Involve utilities in transmission improvements** by requiring utilities to identify cost-effective upgrades to their system that will unbottle renewables.
4. **Streamline the PPTPP** to achieve selection of a transmission project within one year from the initial NYISO submission to the Commission of proposed transmission needs.
5. **Act timely on Article 7** to allow for a decision within one year after a completed Article 7 application is filed by the transmission developer.
6. **Identify a policy need for offshore wind in PPTPP** and simultaneously convene a task force to explore innovative funding mechanisms to support coordinated offshore wind transmission investment.
7. **Require the NYISO to create efficient policies for renewables + storage.**
8. **Support and advocate for improvements to the NYISO interconnection process.**

II. The Impacts of Inadequate Transmission

a) Increased Renewable Resource Bottling

When output from renewable generators is curtailed because of insufficient transmission, the generation gets bottled. Bottling has two potential impacts: (1) the curtailment (non-production) of a portion of the possible energy and (2) the strong depression of market price (i.e. location-based marginal price (LBMP)) that is paid for the un-curtailed portion of the possible energy. Developers of renewable energy projects forecast both these risks and price them into the cost of developing a project. Both these risks, being on the rise, are at this moment delaying development of many hundreds of megawatts (MW) of renewable energy projects.

Studies have shown increased levels of bottling for renewable energy with 50% renewables penetration by 2030. For example, when the [July 2018 NYISO Study](#) identified areas of potential bottling with curtailment of existing and new renewable resources in the State, the area covered almost the whole of Upstate New York, see Figure 1 below.

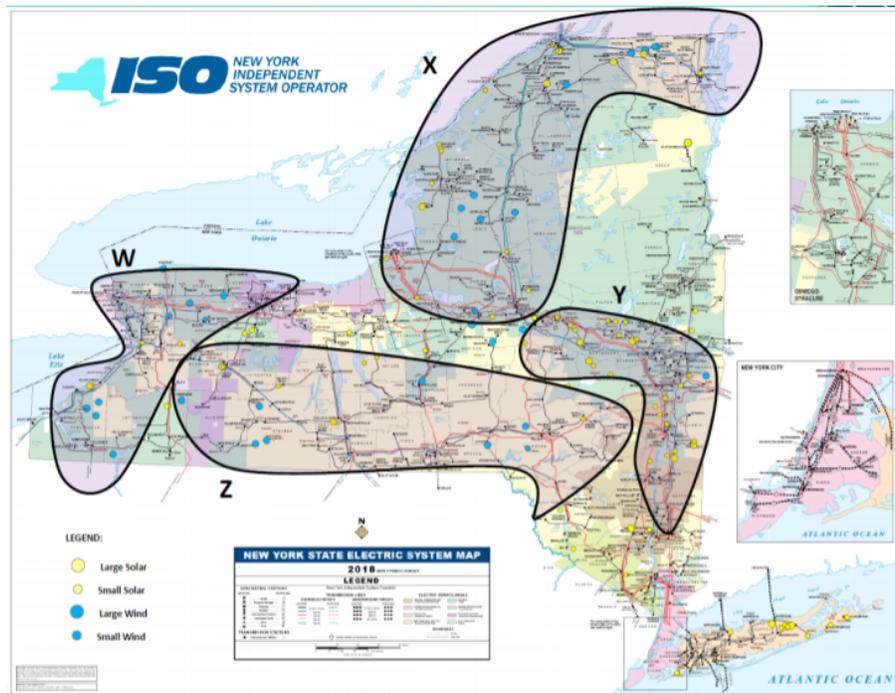


Figure 1: Transmission areas with high risk of ‘bottling’ renewables

According to the study, transmission upgrades in the West and in the Southern tier could unbottle over 1,000 MW of renewable resources. Upgrades in the Northern tier could unbottle another 1,000 MW. The potential for so much generation unbottling demonstrates the need for additional transmission investments. Below, Figure 2 from the study (slide 28 from NYISO July 2018 presentation) is illustrative. It shows the extensive curtailment of renewables in selected Upstate zones during summer peak hours and light load hours projected for the year 2030.

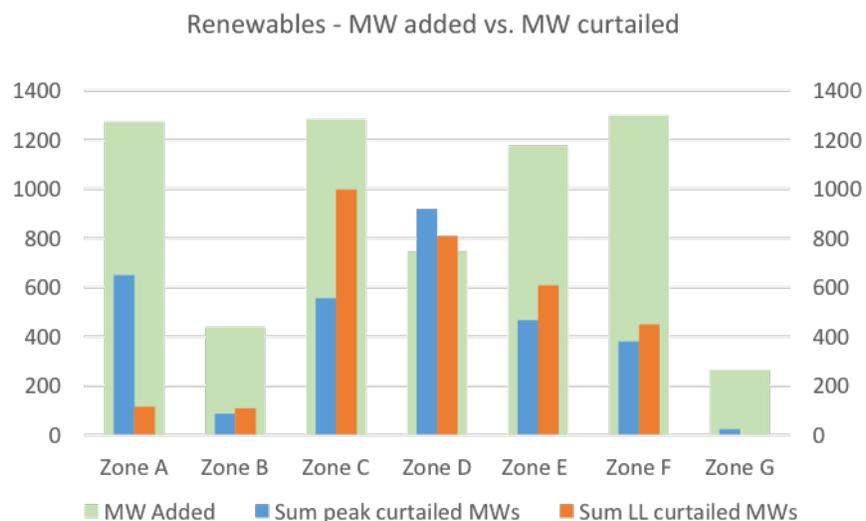


Figure 2: NYISO July 27, 2018 presentation



An older but more detailed study, the [2010 NYISO Wind Generation Study](#), examined the need for transmission expansion in specific locations that would be required to accommodate many thousands of MW of renewables, specifically land-based wind projects. Conceptual transmission solutions were identified, and cost estimates were provided. This study accurately predicted some of the local problems that are now being encountered in 2019.

This bottling will potentially get more acute as actions are taken to comply with the CLCPA. In addition, the CLCPA mandates that 9,000 MW of offshore wind resources be built by 2035. Moving this power to shore will require transmission investments as well. Failing to comprehensively plan for such capacity additions will result in a piecemeal, insufficient and overly costly expansion of the New York grid. In contrast, planning and executing strategic investments now will allow clean energy goals to be achieved most cost-effectively.

b) Negative Marginal Energy Prices

Another impact of inadequate transmission is negative marginal energy prices. As a result of bottling, some of the existing renewable resources are occasionally being curtailed. When supply is high and demand is low and there is not enough transmission to move the excess power, prices can be very low or even turn negative for the non-curtailed majority remainder. For example, the [2017 Growing Evidence of Increased Frequency of Negative Electricity Prices in U.S. Wholesale Electricity Markets Paper](#)³ shows increasing frequency of negative prices faced by the resources. Figure 3 below shows increasing number of hours of negative prices, especially in the northern zone.

Figure 4 shows many of the negative priced hours occur primarily in the 00:00 to 06:00 hours of the day when there was a low demand for electricity. In periods of low demand, renewables such as wind projects can fulfill larger percentages of supply. Absent transmission expansion, the owners of many renewable projects could be paid very little when their projects are producing the most power. The more this financial risk to future revenues increases, the more it will slow renewable development. Moreover, the threat of low future prices can be forecast and will be included in the contract price. Thus, either the proposed project would become uneconomic to build or ratepayers would be paying a higher cost for it to be built.

³ Bajwa, Maheen and Joseph Cavicchi. *Growing Evidence of Increased Frequency of Negative Electricity Prices in U.S. Wholesale Electricity Markets*. International Association of Energy Economics. Fourth Quarter 2017. <https://www.compasslexecon.com/wp-content/uploads/2018/04/Growing-Evidence-of-Increased-Frequency.pdf>

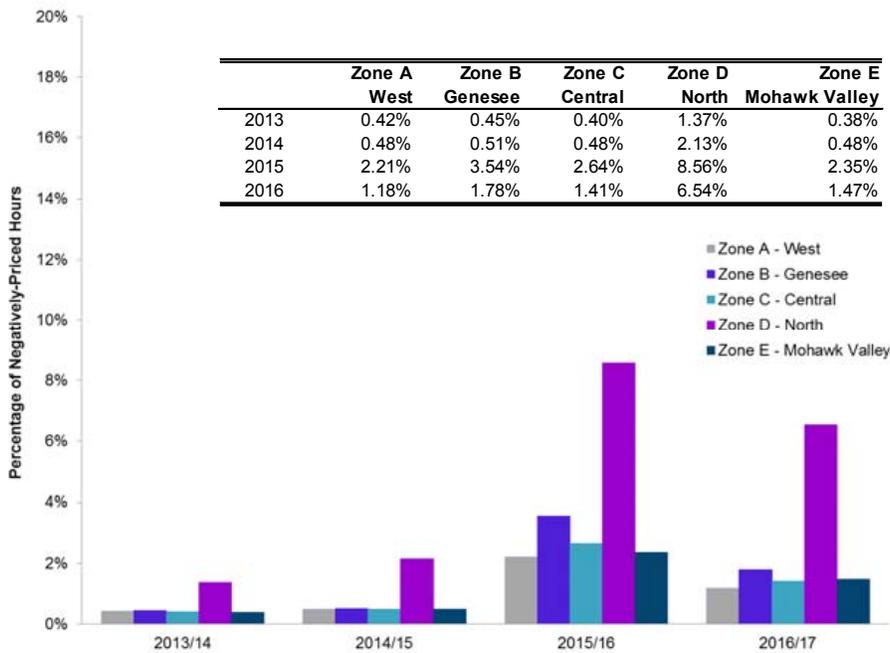


Figure 3: Bajwa and Cavicchi, page 39

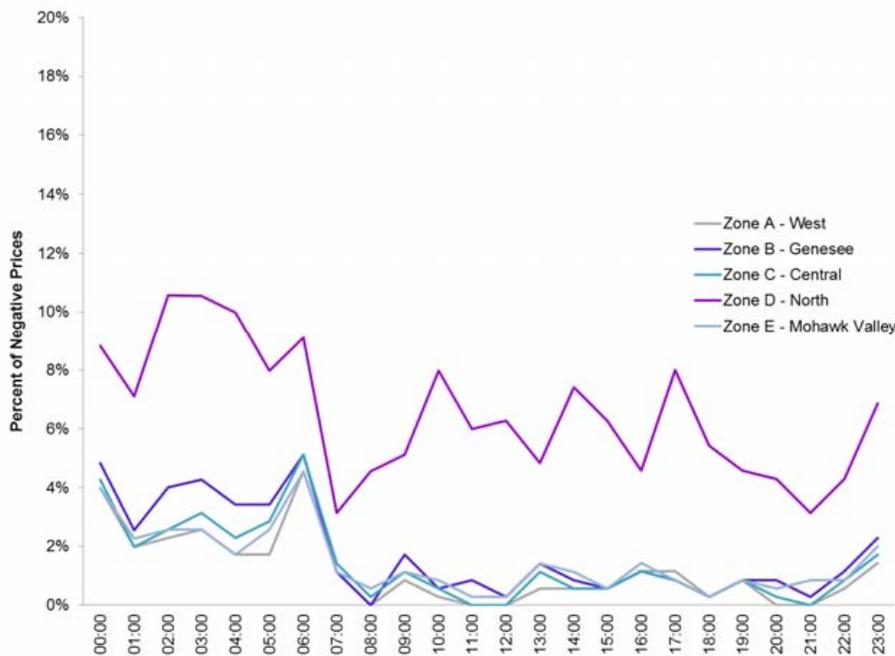


Figure 4: Bajwa and Cavicchi, page 39

The [2017 NYISO Integrating Public Policy Report](#) also confirms significant low and negative prices in western New York. Note that the information presented in Figures 3 and 4 above modeled 50% renewables by 2030. Now, with a 70% renewables by 2030 goal, the situation will only get more acute.



c) Increased Renewable Energy Credit (REC) Prices

The third consequence of inadequate transmission is increased prices for renewable energy credits (RECs). When renewable resource developers bid into New York State Energy Research and Development Authority's (NYSERDA's) REC auctions, the developers forecast revenues from the market they would receive for their projects and then determine the residual money they need to meet the hurdle rates for their investments. The residual they need to recover influences their bids into NYSERDA's competitive renewable solicitations. If the bidders forecast increased levels of bottling and negative prices for the resources in the future, all else equal, their REC bid prices would increase. This, in turn, will increase REC prices that consumers would have to pay. Also, this has the potential to put New York generators at a disadvantage when competing with out-of-state generated RECs. Thus, in-state generators take a double hit: 1) the lack of transmission reduces their markets for the sale of power, and 2) their RECs, which are unbundled from power, become higher priced and less attractive. If transmission upgrade plans that would help reduce the bottling and the incidence of negative prices were established and known in advance of the REC bids, it would help lower REC prices, benefit consumers, and help generators better compete.

III. Transmission Solutions

The issues raised above can be addressed by adding transmission strategically in a cost-effective manner, minimizing barriers to interconnection, and making the regulatory process more efficient. This will require rapid improvements to transmission planning processes in New York, as well as increased coordination between the Commission and the NYISO.

a) Rapidly Identify Transmission Enhancements to Support Renewables

Adding transmission is of the utmost importance to promote renewable electricity. It will help meet the State's clean energy goals; meet these goals most cost-effectively; reduce consumer costs; and ensure reliable supply in the face of impending retirement of nuclear and fossil fuel generation.⁴ Upgrades to both bulk transmission ("highways") as well as local transmission owned by utilities ("byways") are needed. Some of the specific transmission needs on "highways" are well known. For example, in its January 2018 filing to the Commission, [NextEra Energy recommended](#) the following upgrades based on its studies.

- Northern New York transmission corridor: increase the transfer capability by 900 MW above the original limits of the Moses South Interface.
- Central East transmission corridor: increase the transfer capability by 3,000 MW above the original limits of the Central East Interface.

⁴ For example, the retirement of the 2,000 MW Indian Point Nuclear station (in 2021/2022) leaves downstate without an abundant, local carbon-free energy source until offshore wind projects are built. In addition, the NYISO has identified over 8,300 MW of aging thermal resources that, in the next decade, will reach the age at which 95% of similar resources have retired nationally. See [NYISO Power Trends 2018](#), page 16.



- Southern New York transmission corridor: increase the transfer capability by 1,000 MW above the original limits of the UPNY-CONED, UPNY-SENY, and Dunwoodie South Interfaces.
- Dysinger East transmission corridor: increase the transfer capability by 900 MW above the original limits of the Dysinger East interface.
- West Central New York transmission corridor: restore the transfer capability of the West Central interface to its original limits.

While this may be an ambitious list of projects, the Commission should rapidly identify a list of “no regrets” transmission upgrades that address current and future curtailment and negative pricing based on current generators, generators in the interconnection queue, generators holding NYSERDA REC contracts, and the generation that will be developed to meet CLCPA’s goals. Transmission projects that will facilitate the delivery of Upstate renewable generation to downstate loads must be a part of the “no regrets” transmission upgrades.

There are also needs at the “byways” level, though there is no comprehensive published list of these needs. Most studies examine only high-voltage transmission corridors and neglect the portion of the grid that operates at 115kV and below. However, the 2010 NYISO Wind Generation Study did go into detail about lower-voltage local networks. It showed the need for substantial transmission expansion projects in certain pockets where competing renewable projects are currently being proposed in clusters. Two examples of the pockets identified then are in evidence now: the 115kV grid in Steuben County (Zone C) and the 115kV grid in Jefferson County (Zone E). In both of these pockets, well over 1,000 MW of renewable projects (including decades-old hydro-electric plants) have connected or have proposed interconnection. Absent local transmission expansion, many of these projects risk curtailment and negative prices as described above. Unfortunately, due to the locations involved, effective transmission expansion will cost more than individual generation project owners can bear. To maximize renewables investment and production in these locations, multiple transmission lines need upgrading or construction.

Many utilities can identify opportunities for upgrades on their local systems that would help unbottle output from current and proposed renewable projects. Some of the upgrades could be made by the incumbent utilities in the context of simply doing their routine local transmission upgrades that would have multi-value proposition including unbottling of renewable resources. Other upgrades would have to be done solely to accommodate more renewables. In either case, transmission projects could be developed that benefit both utility customers and renewables development. Creative cost sharing solutions between the utilities and renewable project developers could be found that would provide a win-win for utility customers and renewable developers. This would most likely require collaboration between utilities, renewable developers, and the Commission to move forward.

Action is needed as soon as possible. It would be a mistake to wait until many more renewable projects have contracted with NYSERDA at REC prices that assume bottling. Then, the transmission process would follow along later with transmission expansions that free up energy at the already-contracted prices, whereas earlier transmission expansion could have obtained the same freed-up energy at lower prices.



b) Prioritize Existing Corridors and use “Smart from the Start” Planning

While rapidly identifying transmission enhancements to support renewables, the Commission should view environmental protection as an important guiding principle. Constructing transmission projects to facilitate the State’s clean energy goals using existing rights of way whenever practical offers the best opportunity to substantially mitigate the risk of adverse environmental impacts. Many transmission needs can be addressed by upgrades in existing corridors. Environmental impacts can be further limited by following “Smart from the Start” policies and criteria, which address a range of important concerns.⁵ In particular, any transmission development in new areas that conflicts with wildlife conservation areas should be avoided whenever possible and long-term conservation improvements should be implemented to mitigate impacts. Environmental mitigation costs should be incorporated into cost analyses when assessing the cost effectiveness of potential projects, which is a best practice followed in several state planning processes and by the Western Electricity Coordinating Council.

c) Plan Offshore Wind Transmission

New York’s nation-leading 9,000 MW offshore wind goal is now a mandate in law. This ambitious level represents a significant portion of the renewable energy necessary to meet the State’s 70% renewable electricity mandate. Given its close proximity to load centers in the Downstate metropolitan region, offshore wind development will help address some of the transmission congestion issues that impede the flow of Upstate renewable generation to Downstate load centers. However, offshore wind has its own transmission challenges and it is clear from comments submitted as part of the Commission proceeding on offshore wind (Case 18-E-0071), that there are differing visions of optimal transmission for offshore development.

To maintain momentum towards the 9,000 MW goal, it is imperative that New York issue a second offshore wind RFP in 2020 and publish a schedule of future annual solicitations to ensure that the 2035 statutory target is met. Decision-making regarding coordinated development of transmission for offshore wind should occur simultaneously to meet this timeline but should not delay the solicitation process. First, the Commission should declare a Public Policy Transmission Need for offshore wind in the PPTPP proceeding (Case 18-E-0623). Second, the Commission should convene a Task Force with NYSEERDA, New York Power Authority (NYPA), Long Island Power Authority (LIPA), the NYISO, relevant investor-owned utilities, offshore wind developers, qualified transmission developers and other stakeholders to explore innovative potential funding mechanisms to support offshore wind transmission investment. One option is to continue to have each developer integrate the cost of transmission into the individual bids they submit to NYSEERDA as part of the procurement process. Another approach is to consider a “backbone” or shared transmission approach. To be clear, planning for a backbone transmission will take significant time and resources, and although this planning is critical to efficient, long-term development and interconnection of regional offshore wind projects, backbone transmission planning should not delay federal permitting or leasing, or New York State solicitation of offshore

⁵ Carl Zichella & Johnathan Hladik. *Siting: Finding a Home for Renewable Energy and Transmission*. The Electricity Journal, Volume 26, Issue 8. October 2013. <https://americaspowerplan.com/wp-content/uploads/2013/09/APP-SITING-PAPER.pdf>.



wind development with project-led interconnection. Each potential funding mechanism should address the questions of procurement approach, cost allocation, cost recovery, and ownership of the transmission assets. This deliberation should proceed on a parallel track with the FERC Order 1000 planning process, as the questions of funding, cost allocation, and ownership need to be addressed regardless of what specific transmission projects are ultimately selected to move forward.

d) Reduce Barriers to Interconnection

Developers of renewable generation have found that navigating New York's interconnection process, from start to finish, takes an unduly long time. This significantly increases the difficulty and cost of getting a project built in New York and acts as a disincentive for the development of new renewable generation facilities. The most problematic part of the process is the NYISO's Class Year Study, which has regularly taken two years or more to complete. To address this problem, the [2019 NYISO Grid in Transition Draft Report](#) states that reforms to the Class Year Study process have been proposed and the NYISO is currently planning to send a package of modifications to FERC by the end of 2019. These proposed modifications show some promise of reducing the length of the study. New York's utilities also play a large role in conducting interconnection studies, including the Class Year Study, and their performance must also be improved. Utilities currently do not have a strong incentive to make the interconnection process smooth or timely. An increase in staffing at the utilities, and the hiring and retaining of engineers with deeper experience is needed, even in light of the strong industry demand for such personnel. While this may raise the personnel costs at the utilities, a strong drive forward in this area is essential if New York is to have any chance of achieving its aggressive clean energy goals cost-effectively. New York could also explore allowing industry to provide funding for utility personnel that would be dedicated to improving the interconnection process, and precedent for this exists within federal agencies. The Commission should signal to the utilities the strong need to redouble efforts in this area and insist on high quality and timely interconnection results.

Another issue is the NYISO Minimum Interconnection Standard (MIS) which provides an inexpensive solution to interconnection by assuming that existing generation will be displaced (i.e., will produce less electricity). The intent of this protocol is to prevent new projects from having to pay for the cost of transmission upgrades that would be required if the system had to simultaneously deliver power from both the new project and from existing nearby resources. However well that the assumption of displaced generation worked in the past, now in Upstate NY the existing resources that would be displaced by the incoming new renewable resource are likely to be existing *renewable* resources. This 'cannibalization' of renewables will result in much slower progress made toward the renewable energy goals. On the other hand, obliging a new resource to absorb the cost of transmission upgrades will likely result in that project not being built. Either way, individual renewable projects – whether proposed or ten years old – are jeopardized if the cost of transmission upgrades for interconnection is not fairly allocated in some way. The Commission should encourage the NYISO to revisit and update the MIS process in light of the CLCPA goals and current circumstances.



e) Increased Focus and Urgency in Transmission Planning and Permitting

A primary recommendation of this Brief is that the Commission should soon declare a Public Policy Transmission Need to facilitate renewables, under the 2018 PPTPP which commenced in August 2018. We strongly recommend that the Commission should pursue two paths simultaneously: (1) immediately identify several specific transmission needs based on current curtailment and negative pricing combined with pending interconnection requests in the same area, and (2) identify a generic transmission need related to the ambitious clean energy mandates included in the CLCPA. This approach will allow New York to act quickly on some well-known, no-regrets transmission investments *now* while also inviting innovative solutions to the broader need. Transmission planning in New York must shift quickly from its historically reactive ‘wait-and-see’ stance to active planning of the grid that must be in place to support the clean electricity goals.

Many admit that the PPTPP is very cumbersome and time consuming. The NYISO has attempted to streamline some of its process steps based on lessons learned from the Western NY project. The NYISO is still in the process of further streamlining based on lessons learned from the two AC transmission projects. The NYISO and the Commission should continue to work together to streamline this critically important planning process. The goal should be that project selection and approval by the NYISO can be completed within twelve months from the initial NYISO submission to the Commission of proposed transmission needs. And, the Commission should certify the transmission lines within 12 months thereafter in its Article 7 process from the time an Article 7 filing is deemed complete. These actions would reduce uncertainty and costs to the developers and ultimately to the consumers. Even under these improved timelines, it would take several years from when the NYISO starts the planning cycle to when an approved transmission project obtains its Article 7 certification.

IV. Conclusions & Recommendations

Fundamentally, the current transmission planning process is based on the grid we have and not on the grid that we *need* to have to meet New York’s clean energy goals. New York’s nation-leading carbon and clean energy goals simply cannot be met most cost-effectively without addressing the current and future bottling of renewable resources and resulting negative energy prices; without fixing an overly lengthy and expensive interconnection process with developers, utilities, and the NYISO; and without re-designing an overly slow, tedious and inefficient process to identify and approve transmission investments. But all of these challenges have solutions. There is an urgent need to reduce these barriers by adding strategic transmission upgrades, removing barriers to private investment in transmission, addressing interconnection issues, and speeding up the planning process. These steps would reduce uncertainty and costs to developers, and thus costs to consumers. These steps would also support existing and future renewable generators and will help New York achieve its ambitious carbon reduction goals most cost-effectively.



- 1. Identify Several Specific No-Regrets Upgrades in the Current PPTPP.** The Commission should rapidly identify a list of “no regrets” transmission upgrades that address current and future generation curtailment and negative energy pricing. This list should be based on existing generators, generators in the interconnection queue, and generators holding NYSERDA REC contracts. Transmission projects that will facilitate the physical delivery of Upstate renewable generation to Downstate loads must be a part of the “no regrets” transmission upgrades. Studies exist that can support these decisions being made now in Case 18-E-0623.
- 2. Identify a Generic Public Policy Transmission Need Related to Renewables.** On a separate track, the Commission should identify a generic Public Policy Transmission Need in Case 18-E-0623 based on the renewable energy mandates in the CLCPA. The NYISO could then solicit solutions/projects for this generic need based on the amount of generation that will need to be developed to meet the CLCPA goals. This could be on a simultaneous and parallel track (to the specific “no regrets” projects recommended above) in the current PPTPP. This would allow the private sector to propose a variety of transmission solutions for further exploration and evaluation and would recognize that New York’s ambitious renewable energy goals warrant new, creative approaches.
- 3. Involve Utilities in Transmission Improvements.** The Commission should initiate a process to require utilities to identify potential cost-effective transmission and distribution upgrades on their systems that would also help unbundle renewable resources, especially on the byways. Failing to socialize the cost of upgrades to the byways will discourage competitive development of smaller (<100 MW) projects and will drive development toward very large (>250 MW) projects that can connect to the 345kV backbone.
- 4. Streamline the PPTPP.** The Commission and the NYISO should collaborate to rapidly identify opportunities to streamline and improve the Public Policy Transmission Planning Process to shorten its timeframes. The goal should be that the NYISO is able to select a transmission project within 12-months of their initial submission of proposed transmission needs to the Commission.
- 5. Act Timely on Article 7.** The Commission should act on transmission Article 7 applications to allow for a decision within a 12-month period after a completed Article 7 application is filed by the transmission developer. These goals could cut the total delay time significantly.
- 6. Identify a Policy Need for Offshore Wind in PPTPP.** Given the importance of offshore wind in attaining New York’s 70% renewables requirement, the Commission should act quickly to identify a Public Policy Transmission Need related to offshore wind in Case 18-E-0623 and simultaneously convene a Task Force with NYSERDA, NYPA, LIPA, the NYISO, relevant investor-owned utilities, offshore wind developers, qualified transmission developers and other stakeholders to explore innovative funding mechanisms to support coordinated offshore wind transmission investment. Failure to act will impede the state’s ability to meet its renewable goals, and will result in piecemeal, ineffective or lacking and lagging transmission expansion.



- 7. Require the NYISO to Create Efficient Policies for Renewables + Storage.** The Commission should recognize that grid-scale solar or wind partnered with grid-scale storage is becoming the norm in other parts of the country. However, the NYISO interconnection process is not clear when it comes to connecting two dissimilar resources together so that they may operate in concert. Efficient use of available energy (as well as state incentives for energy storage) depends on resolving the current confusion surrounding the NYISO interconnection process and rules about market participation. The Commission should ensure that the NYISO accelerates the clarification of rules and the accommodation of energy storage in the most flexible and efficient way possible for the benefit of New York consumers.⁶
- 8. Support and Advocate for Improvements to the NYISO Interconnection Process.** Finally, the Commission should recognize that the current NYISO interconnection process presents long delays that put certain projects at risk of losing eligibility for time-sensitive incentives, or of not meeting NYSERDA contract requirements. The Commission should signal to the utilities and to the NYISO the strong need to redouble efforts in this area and insist on high quality and timely interconnection results. The Commission should also require utilities to act to improve the interconnection timeframe and establish metrics for the utilities regarding interconnection of grid-scale projects. Each utility should be required to appoint an ombudsman to deal with interconnection issues for grid-scale renewable projects. Finally, the Commission should advocate for a reexamination and updating of the Minimum Interconnection Standard methodology and process in light of the CLCPA goals.

⁶ NYISO recently identified this issue as a priority through its annual market participant scoring process and has committed to working on a project (“Hybrid Storage Model”) in the 2020 timeframe. The project will aim to develop market participation rules that better integrate large-scale renewables and energy storage resources co-located behind a single interconnection point. See project 31 in NYISO’s [Market Project Candidates](#) dated 8/28/19.