Understanding the impact of the Inflation Reduction Act on NYISO prices

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Key takeaways

- The IRA is expected to spur development of clean energy technologies across the country by providing lucrative tax credits and helping developers lower their levelized cost of electricity (LCOE). However, in New York, lower LCOE will be accompanied by falling Index REC payments from the state. Consequently, while some projects will see appreciable gains in net profitability, a majority will see only marginal impacts.
- We find that developers of onshore wind upstate, and well-sited solar downstate and Long Island, stand to benefit the most from the IRA. After ITC and PTC, some projects—under certain scenarios—may find merchant revenues more than sufficient to cover their LCOE.

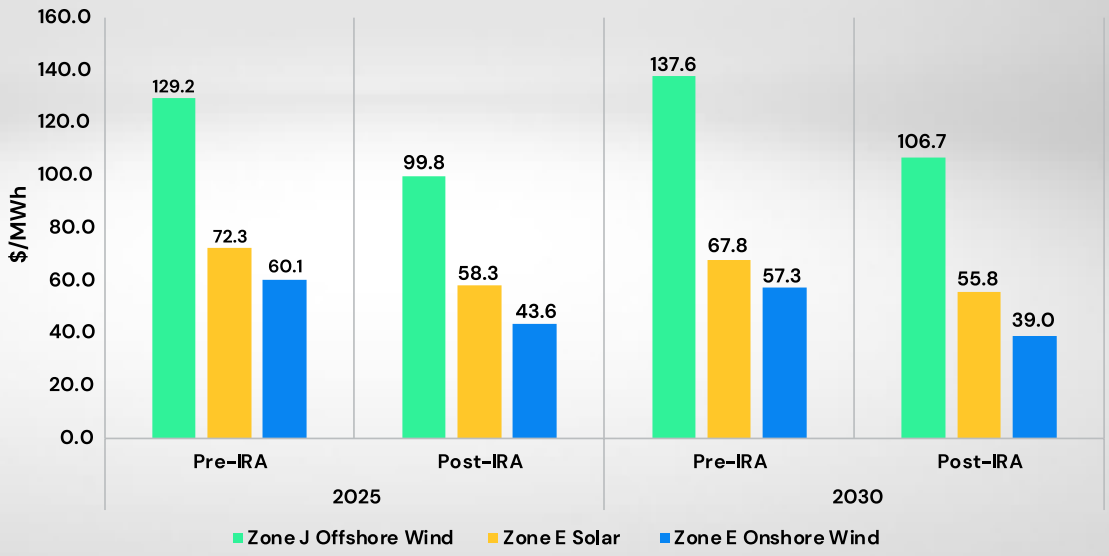
- However, they will need to be aware of several conditions. Capital and labor costs have escalated and may persist if investment in supply chain and skilled labor continues to lag demand. Challenges such as budget and timeline overruns and diminishing energy market revenues may emerge due to transmission bottlenecks. These costs will offset the IRA impact and developers will need to include associated risk premiums in their project LCOE.
- Despite these uncertainties, New York has recently shown a commitment to accelerating transmission development that is identified as critical to meeting the state's clean energy goals. Developers will need to keep an eye on the pace of expansion, as it will dictate the extent of the IRA's impact on clean energy economics.

The recently passed Inflation Reduction Act (IRA) is a sweeping piece of legislation that supports clean energy development in the United States through a spate of incentives. There are enhancements to the existing investment tax credit (ITC) and production tax credit (PTC), which are now available to new solar and energy storage facilities, and entirely new statutes such as an incentive for existing nuclear plants. Further, there are stackable bonuses for sourcing domestic components and siting in "energy community" areas (regions with high unemployment that have been dependent on traditional energy sources), and incentives for investments in domestic manufacturing.

All in all, the IRA is expected to drive $369B in investments for energy security and climate change, along with domestic energy production and manufacturing. As we previously highlighted, the IRA significantly improves economics of clean energy resources in the U.S. We calculated double-digit percentage declines in post-IRA LCOE—the average cost of electricity generation over the lifetime of a facility—for various clean energy technologies, with wind and solar having the potential to undercut legacy resources like gas-fired combined cycle (CCGT) facilities.

Developers in New York can likewise expect improving LCOE. We calculated declines of up to 20%, 30%, and 23% in post-IRA generic solar, onshore wind, and offshore wind LCOE respectively (see Figure 1). However, there are some caveats. With lower LCOE there will be a concurrent decline in Index REC payments from the state, resulting in only select projects seeing appreciable gains in net profitability.[1] Transmission and interconnection bottlenecks are expected to persist in the next few years. Additionally, recent installation cost inflation may offset some of the IRA gains. In this paper, we analyze these factors and highlight key considerations for clean energy developers in New York in a post-IRA world.

Figure 1: Impact of IRA on LCOE in New York



[1] REC, or renewable energy credit, is the attribute assigned to clean energy generation. 1 REC equals 1 MWh of clean energy output.

Declines in clean energy LCOE will be offset by lower Index REC Prices

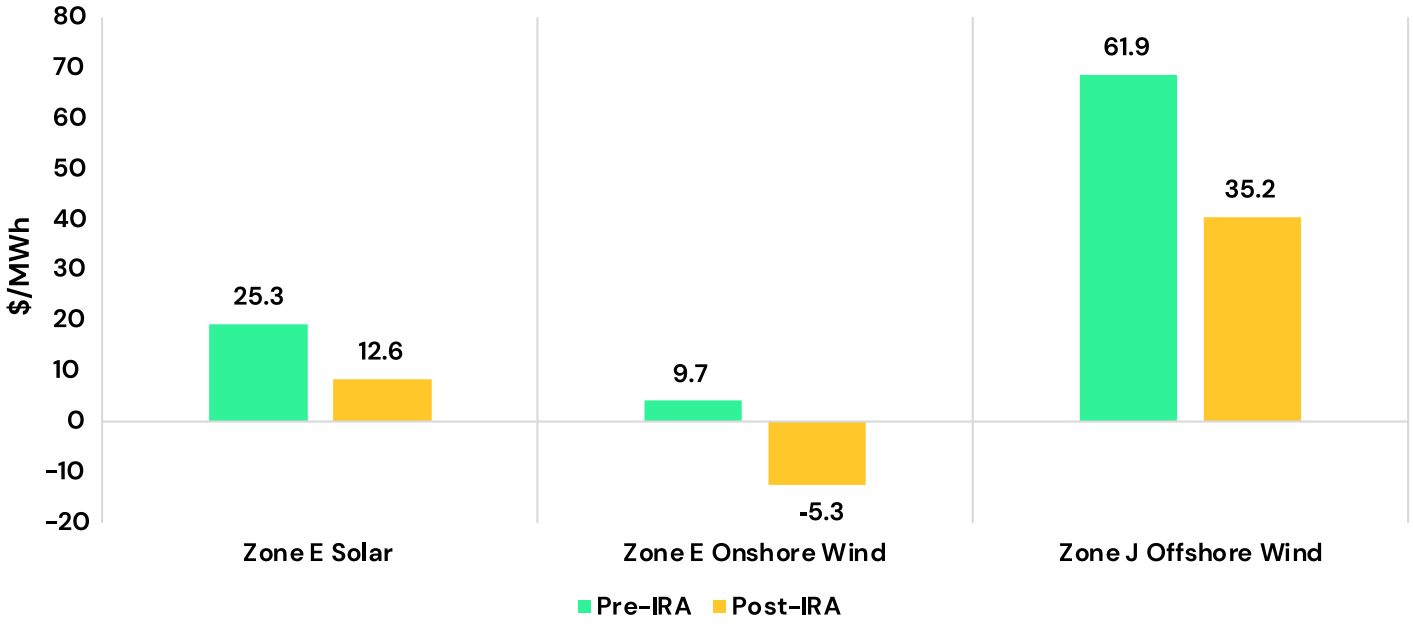
But net profitability for certain projects in New York may grow

Renewable development in New York is driven by ambitious clean energy targets enshrined in the state's Climate Leadership and Community Protection Act (CLCPA). Procurement is undertaken by the central procurement agency, New York State Energy Research and Development Authority (NYSERDA), which offers developers long-term contracts for the purchase of RECs. Since 2020, it has offered developers Index REC price contracts in which projects receive variable REC payments indexed to energy and capacity market conditions. These REC revenues are additive to wholesale market revenues and are intended to be make-whole payments from NYSERDA to bridge the gap between renewable LCOE and merchant revenues.

With the passing of the IRA, LCOE are projected to decline, narrowing the gap with merchant revenues. As a result, there will be a concurrent decline in Index REC payments. In essence, for many projects the IRA will result in a like-for-like swap of a portion of project revenues from Index REC to ITC and PTC. Indeed, our analysis suggests that for the average solar project in upstate New York and offshore wind project in New York City or Long Island, net profitability will see only marginal improvement.

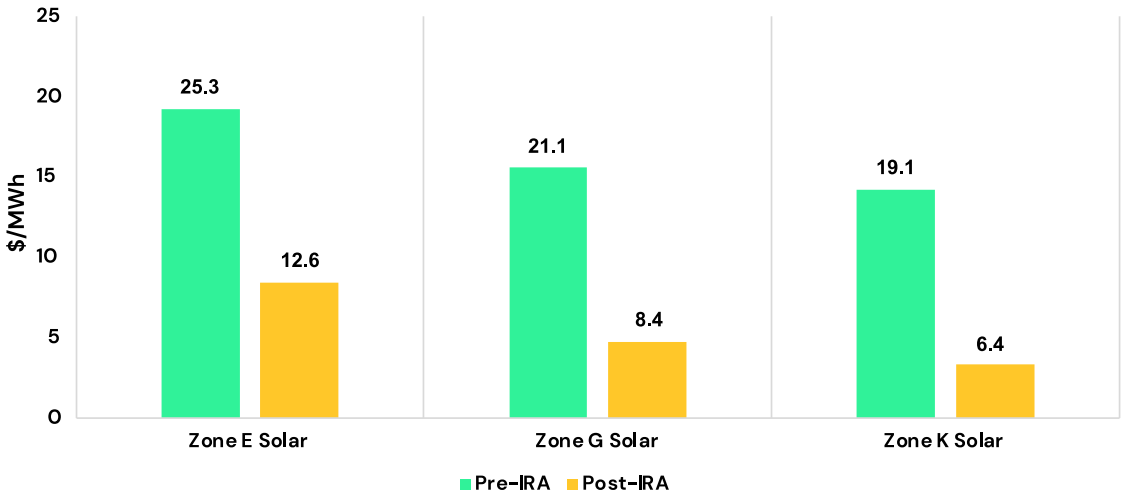
There will be tangible benefits, however, for certain well-placed projects. Developers of new onshore wind facilities stand to gain the most from the IRA. Figure 2 shows the pre- and post-IRA net present value (NPV) of Index REC prices over the typical length of a REC contract (20 years). The technologies of focus include generic onshore wind and solar in Zone E and generic offshore wind in Zone J. While all technologies see double-digit declines, onshore wind sees the greatest percentage impact. Its Index REC prices are projected to drop to values under zero, implying that wholesale market revenues will be greater than LCOE. Some onshore wind projects in upstate New York could be better off participating as fully merchant resources instead of availing Index REC contracts.

Figure 2: Impact of IRA on 20-year NPV of Index REC prices for generic projects coming online in 2030 in New York



Similar gains may be in store for solar projects sited in premium regions and with favorable development costs. Figure 3 compares the projected 20-year NPV of Index REC prices for generic solar projects in NYISO zones E, G, and K. Our estimates show that post-IRA REC prices for generic solar projects in Hudson Valley (Zone G-I) and Long Island (Zone K), which benefit from premium energy pricing, will fall to single-digit values. In these zones, developers with access to superior sites and competitive financing and EPC costs may be able to lower their LCOE further and forgo make-whole Index REC payments. For such projects, the IRA will prove to be a boon for net profitability.

Figure 3: Impact of IRA on 20-year NPV of Index REC prices for generic solar projects coming online in 2030



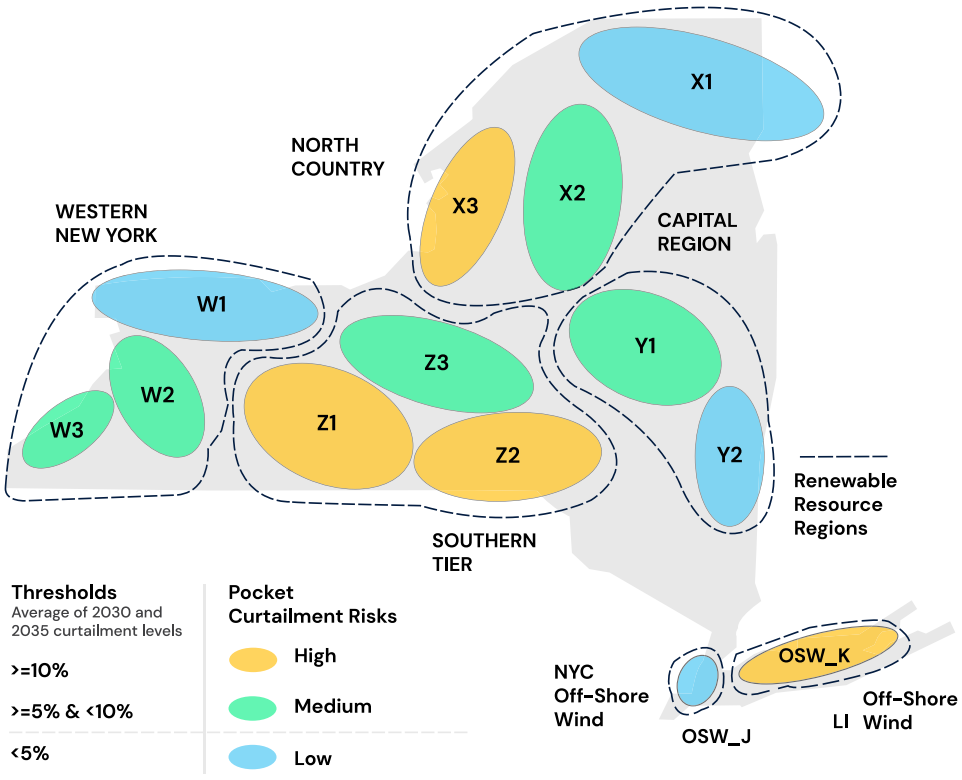
There will be other, albeit subtle, benefits too. The IRA's ITC and PTC are more secure revenue streams than Index REC payments that leave projects exposed to market fundamentals and fluctuations. Developers under an Index REC contract must account for risks such as nodal-to-zonal price basis, day-ahead to real-time price basis, and negative REC payments. By replacing a higher-risk revenue stream with more certain and less volatile ITC and PTC, the IRA will ease financing costs and hurdles for all developers in New York, helping minimize LCOE. An in-depth analysis of the inherent risks in the Index REC framework is presented in our paper, "Unpacking New York's Indexed REC renewable procurement framework."

Despite the economic incentives, there are some downsides. Our analysis reveals that post-IRA Index REC declines are driven by escalating energy prices in the 2030s on account of expected load growth. An acceleration of renewable development or slow demand growth will put downward pressure on energy prices, negatively impacting project revenues. Similarly, project-specific development and interconnection costs will influence profitability. Capital and installation costs have swollen recently and may persist if investment in manufacturing, shipping, and supply of labor lags demand for renewables. Curtailment risk and interconnection hurdles arising from a lack of transmission capacity will also negatively affect clean energy economics. All these factors will increase LCOE and put upward pressure on Index REC prices.

Transmission-related bottlenecks may offset the IRA impact

Insufficient transmission capability poses the most significant hurdle to renewable expansion in New York. While the IRA allocates substantial incentives for non-emitting technologies and domestic manufacturing and supply chain, it does not sufficiently address transmission expansion required to transmit energy from renewable generation pockets to load centers.[2] Despite recent activity in New York—notably the approval of two HVDC (high-voltage direct current) lines and a slew of public policy transmission projects—a recent NYISO study finds that the New York transmission system, at both local and bulk levels, will be inadequate to achieve policy objectives.[3,4] A significant portion of renewable generation will be built in upstate areas that are geographically and electrically distant from the major load centers in downstate New York, where fossil generation is being retired. Without significant timely transmission expansion from these renewable pockets (see Figure 4), The Outlook estimates that up to 10 TWh of renewable energy (~5% of total renewable generation) will be undeliverable by 2035.[5]

Figure 4: Renewable generation pockets in New York



Source: NYISO

A lack of transmission capability has ramifications for clean energy economics in addition to introducing system inefficiencies. While REC payments are based on all-hours day-ahead energy prices, renewable resources do not generate round the clock. The average prices they realize, called renewable capture rate or realized prices, depend on the timing and amount of energy they generate. Curtailment due to undeliverability will depress realized prices and may render REC payments insufficient to satisfy the revenue requirement of affected projects. Thus, developers that site projects in regions at risk of curtailment (see Figure 4) will need to include a curtailment risk premium in their LCOE.

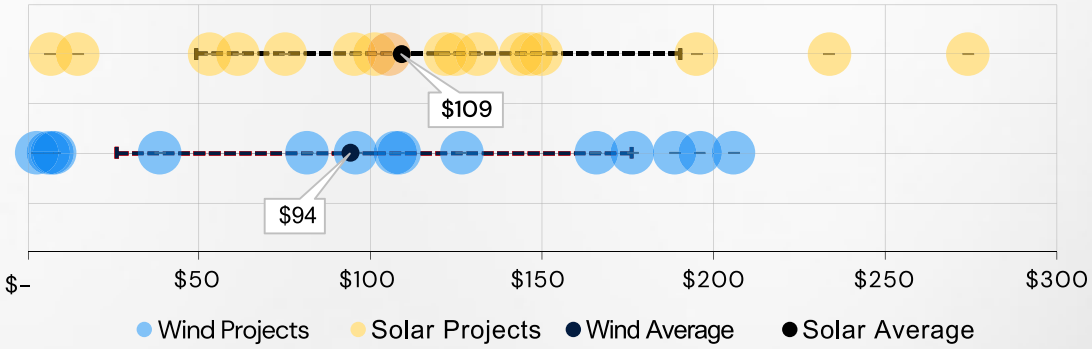
[3] The HVDC lines are Champlain Hudson Power Express linking Hydro-Quebec to New York City, and Clean Path NY linking Zone E with New York City. The approved public policy projects include the Western NY project (Empire State Line), the Segment A and Segment B upgrades (Central East and UPNY-SENY interfaces), and Smart Path Connect (Northern NY Project).

[4] NYISO, 2021-2040 System & Resource Outlook (The Outlook), September 22, 2022

[5] Ibid, pg. 74

There are other implications as well. New generation facilities in New York are assigned network upgrade costs by the NYISO to ensure their full capacities are deliverable to the system.[6] In the three most recent Class Year Facilities Studies (CYFS), weighted average cost allocations for wind and solar projects were $94/kW and $109/kW, respectively (see Figure 5).[7] As new resources enter the system, transmission headroom will decline and associated network upgrade costs will escalate. This will further add a premium to clean energy LCOE, diminishing profitability and putting upward pressure on Index REC prices of impacted projects.

Figure 5: Historical network upgrade cost allocations in $/kW for wind and solar projects in New York



All eyes on transmission

Cognizant of the risks posed by curtailment and interconnection costs, the state is intensifying its focus on transmission development. On April 3, 2020, it enacted the Accelerated Renewable Energy Growth and Community Benefit Act, which aims to streamline the advancement of grid infrastructure upgrades that are identified as critical for attainment of CLCPA goals. Similar exploratory efforts have also been undertaken at the federal level, such as FERC's transmission and interconnection notices of approved rulemaking.

Assuming successful and timely implementation of its initiatives, the state will see a flurry of transmission upgrades in the late 2020s through 2030s to unbottle renewable generation. Certainly, there is now a consensus among grid planners that transmission development must be accelerated if the state is to meet its ambitious decarbonization goals. However, the pace of transmission expansion will play a key role. If it keeps up with demand for new renewables, developers in New York will reap maximum rewards from the IRA. But if it lags, they will encounter cost and schedule overruns and eroding profitability.

[6] Network upgrade costs in NYISO comprise two types of costs - System Upgrade Facilities (SUF) and System Deliverability Upgrades (SDU)

[7] The CYFS is an important milestone in the interconnection process of future generation (and merchant transmission) projects in which the NYISO evaluates necessary upgrades and associated costs to ensure deliverability of MWs throughout the system for interconnecting projects.

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