

Wind energy in New York State

Underutilized resource key to achieving clean energy targets

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Wind energy has the potential to play a central role in reducing fossil fuel consumption across New York State, but the slow growth of wind farms in recent years has contributed to the state falling short of its clean energy targets. Only one in seven wind projects proposed in the last 15 years has actually been built [1], a setback that contributed to the state achieving only 60% of its 2015 Renewable Portfolio Standards target [2]. Unless New York identifies and eliminates barriers to a rapid expansion in wind generation, it will likely need to rely heavily on renewable electricity imports from other states to meet its 2030 target of 50% renewable electricity generation.

Current and potential wind production

New York has plentiful wind resources both on- and offshore. The National Renewable Energy Laboratory estimates that the state could technically produce up to 614 TWh of offshore wind electricity [3] – more than four times total in-state generation of 140 TWh in 2015 [4] – and 64 TWh of onshore wind electricity [3]. This onshore wind capacity could provide nearly half of all in-state electricity generation, yet accounted for only 2.9% of that total in 2015.

New York set a target of 30% renewable electricity generation for the year 2015, but only 24% of its electricity came from renewable resources that year [2]. The bulk of this renewable electricity – 19% of in-state generation – came from hydropower. **Figure 1** shows annual in-state electricity generation from each resource for the last 16 years. Assuming that hydropower and biomass generation do not expand and electricity demand remains constant, combined wind and solar generation would have to grow eight-fold to meet the state’s 50% renewable energy target in 2030.

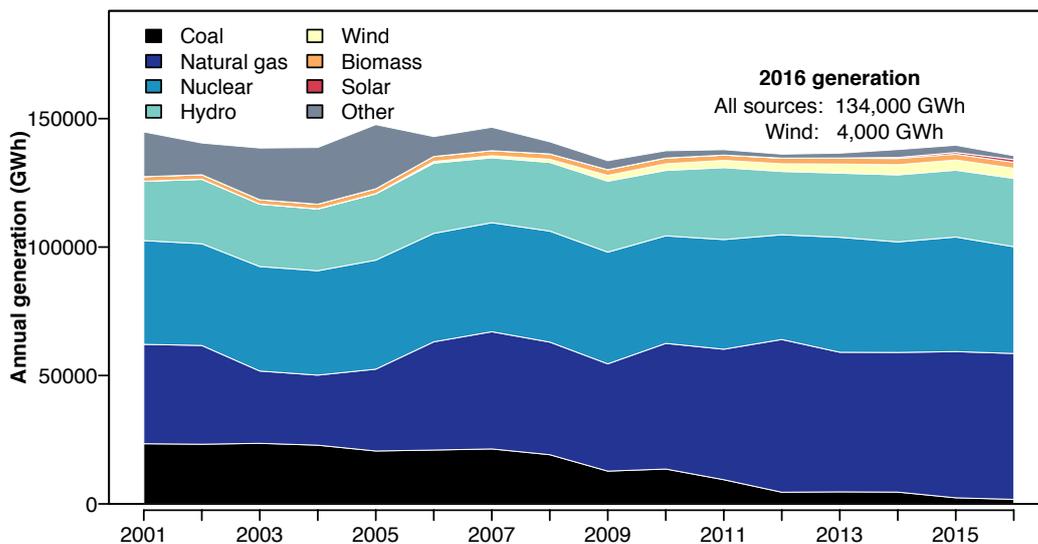


Figure 1: Annual in-state electricity generation in New York, 2001-2016. Each color represents the portion of generation from each resource.

Implementation challenges

This renewable energy shortfall is not necessarily due to an insufficient number of wind farm proposals. The barriers to siting wind farms appear to be manifold. Impediments such as local resistance, financing, and access to transmission lines can all serve as barriers to wind project success. To accelerate the growth of wind in the state, it will be necessary to better understand how such factors limit wind development, followed by strategies to ensure wind farms are acceptable to communities, financially viable, and easy to interconnect.

Since 2001, developers have requested interconnection permits from the NYISO for 162 onshore wind farms [1, 5]. Had these farms all been approved and built, they would generate approximately 42.7 TWh each year. But only 20 of these plants are now operational, in addition to a couple from earlier years, altogether generating less than 4 TWh/year. An additional 35 wind projects are in the current NYISO queue, but approximately 12 of these projects have made no apparent progress, face significant community resistance, or are temporarily suspended, according to analysis of websites and online news sources dedicated to each wind project. Numerous proposals including all generation types – natural gas, solar, wind – ultimately fail to be built. However, from 2001 to 2015, 20 wind farms and 39 natural gas plants came online in New York [5] – whereas 107 wind farms and only 36 natural gas plants were withdrawn from the NYISO interconnection queue.

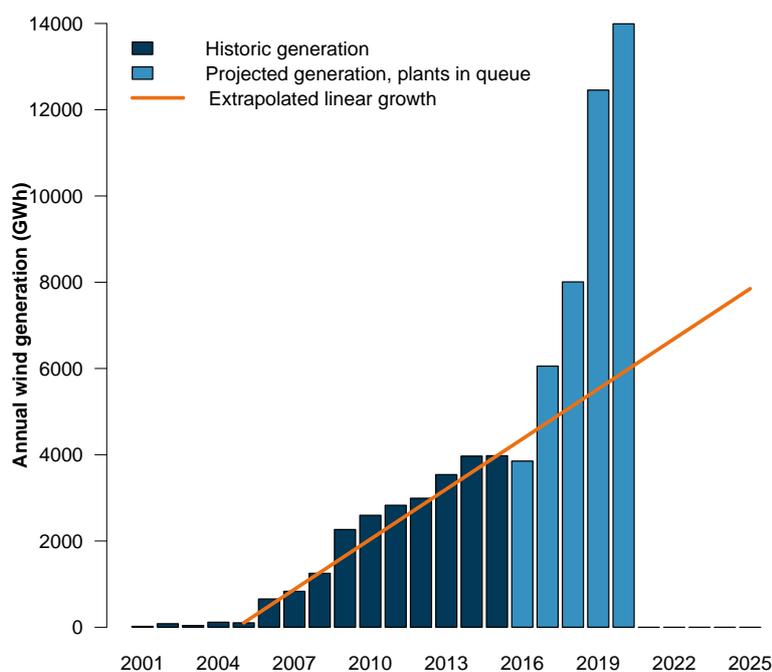


Figure 2: Historic New York wind generation, proposed generation in NYISO queue through 2020, and 2005-2015 linear growth rate extrapolated to 2025.

Figure 2 shows in-state wind generation each year since 2001, as well as the projected generation from proposed wind farms through 2020 if all were built on schedule. Based on a linear extrapolation of the historic wind farm build rate for the next ten years based on the last ten years, nearly 8 TWh/year would be generated in 2025. If all of the proposed projects came online as proposed, that generation level would be reached by the end of 2018. However, given the rate of failure or delay for historic projects and the percent of projects in the queue facing challenges, these scheduled builds cannot be guaranteed.

Moving forward

For New York to meet its renewable energy target for 2030, build-out of wind and solar will have to greatly increase. Like wind, solar will also have to grow at a much faster rate to make a more meaningful contribution to the power mix than 0.4%. Offshore wind is New York's greatest potential renewable resource, but build-out will have to begin soon to ensure enough capacity

is online to meet the state's self-defined goals. The proposed Deepwater wind farm off of Long Island could be the first step. In addition to these resources, energy efficiency can also play a critical role in reducing demand, which in turn reduces the requirements for renewable generation infrastructure.

The growth rates needed to meet New York's renewable energy target are possible. Wind and solar generation in California, for example, went from approximately 3.5% of all in-state generation in 2010 to 16.2% in 2015. However, considering that no new wind capacity was added in New York in 2015 or 2016, it will take an immediate concerted effort to turn around current trends and achieve significant renewable growth. Such an acceleration can be achieved through a combination of strategies. Wind and solar farms may gain more community acceptance if developers work closely with communities before siting projects nearby to address any concerns and find development approaches that provide direct community benefits. The creation of a legally enforceable requirement that utilities procure renewable energy at target levels can help ensure state-wide goals are met. Advanced transmission planning can make for easier interconnection of solar and wind farms. Projects can be further supported through dedicated clean energy funds to help finance initial capital investments. In turn, investment in wind and solar projects can help create jobs and reduce greenhouse gas and criteria pollutant emissions.

New York has significant potential to generate clean electricity from wind, but must rapidly scale deployment for wind to play a meaningful role in achieving 2030 renewable energy targets.

References

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