

Economic Impacts of Wind Development

Understanding how wind projects can economically affect the community



NYSERDA

Wind Energy Guidebook for Local Governments
NYSERDA 17 Columbia Circle Albany, NY12203

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Overview

Any business development will have economic impacts on the local and regional economies, and wind energy projects are no different. Typically, a proposed wind project will affect a community in several ways. Whether any single impact is viewed as a benefit or a drawback depends on the perspective of the stakeholder.

In considering whether to support the development of a wind farm, it's up to the community to decide if the positives outweigh the negatives. To do that, the community must understand the potential economic impacts of wind projects and issues related to local economic activity, land revenue, property taxes, and property values.

1. Local Economic Activity During Planning, Construction, and Operation

Significant economic impacts of the wind industry include payments to local landowners, short- and long-term job creation, and spending on goods and services in supporting industries. All phases of wind development bring increased economic activity to the local area. During the planning stage, this may include easement and lease payments to residents, legal services, and environmental and engineering work. The construction phase usually brings a large number of short-term jobs; increases in hotel and restaurant use by nonlocal workers; purchase of materials, including cement and gravel; and services, such as equipment rental. Some long-term jobs may be created during operation, with ongoing spending on everything from turbine maintenance to plowing access roads in winter.

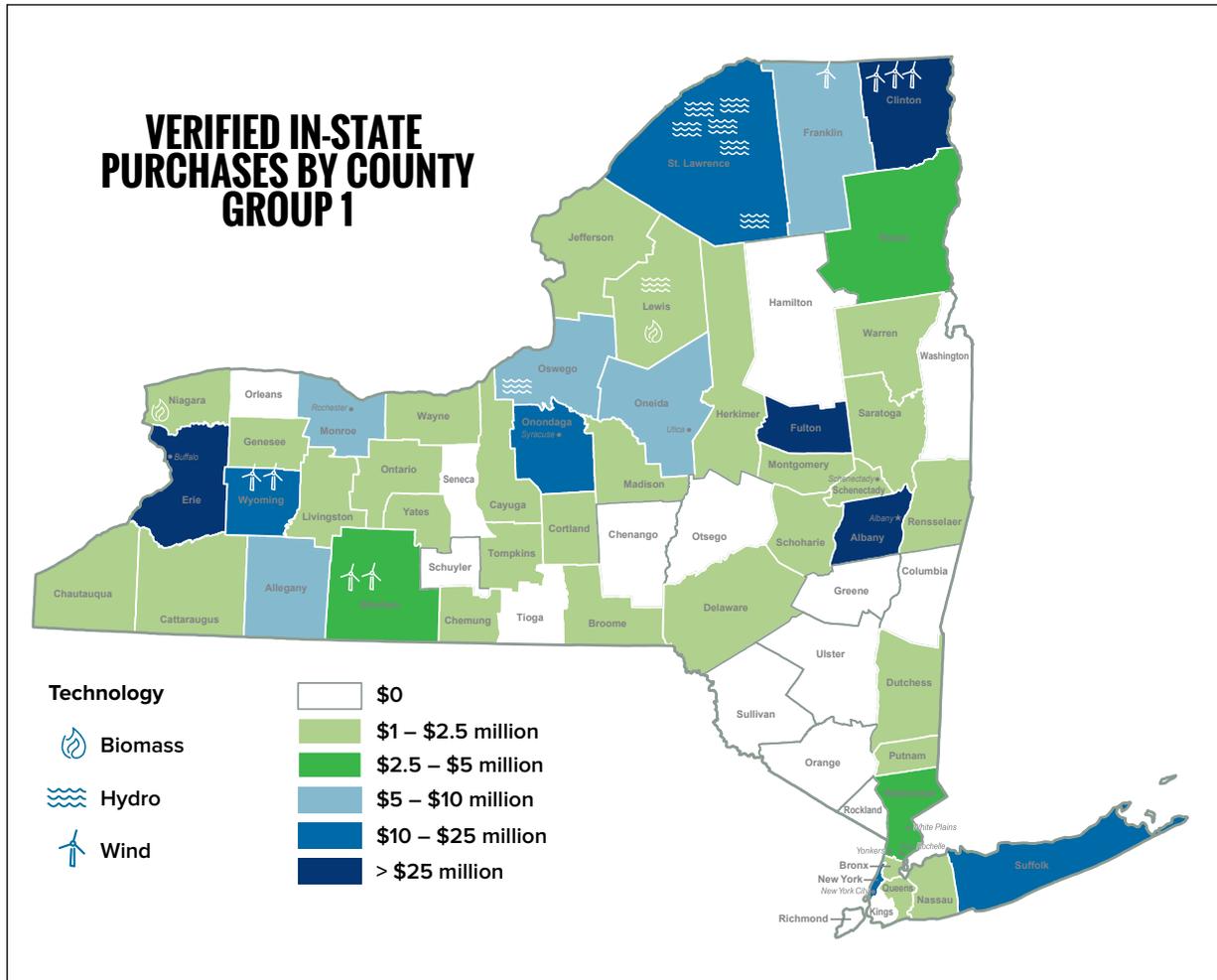
Wind power projects can help diversify, strengthen, and stabilize local economies at the municipal, county, and State level. Increased economic diversification helps improve economic stability by minimizing high and low financial cycles associated with a specific industry. This effect can be particularly important in rural areas, which tend to have a one-dimensional economy, such as agriculture. Additionally, due to the high labor-to-capital ratio, wind projects can add value to the local economy without creating a substantial burden on local and State infrastructure, such as the existing water and sewer system; transportation network; or emergency, education, and other public services.

In 2013, the New York State Energy Research and Development Authority (NYSERDA) released a [study](#)¹ that analyzed the economic benefits resulting from New York State's Renewable Portfolio Standard (RPS). This study analyzed three years of spending from 18 renewable energy facilities under contract to NYSERDA (including two biomass facilities, eight hydroelectric facility upgrades, and eight wind farms) and extrapolated direct investments over the lifecycle of the project. The research examined verified spending on jobs; payments to public entities; in-State purchases; and land leases for these facilities, from development and construction through the first three years of operation.

As shown in Figure 8-1, the geographic and economic impacts of these projects are often concentrated around the project location, but also extend beyond the counties where the projects are located. More than 1,000 in-State businesses spread over 44 counties benefited from the development, construction, and operation of these 18 facilities.

The study found that every megawatt-hour (MWh) of renewable energy generated under the RPS resulted in approximately \$27 of direct investment (NYSERDA 2013). The bulk of the energy production and spending came from the wind farms, which included direct investment of \$1 million/megawatt (MW) installed and \$24/MWh for the eight projects analyzed.

Figure 8-1. Map of verified in-state purchases by county for 18 renewable energy facilities.
 (Source: NYSERDA Renewable Portfolio Standard Main Tier 2013 Program Review)



1.1 Job Creation

As with most construction and commercial development, wind energy projects create jobs. According to the 2016 Clean Jobs New York report, there are 85,197 clean energy workers in New York with 15% (12,400) in renewable energy. Of that 15%, approximately 1,360 jobs are in the wind industry. New York’s clean energy jobs are expected to see a 6% increase in the future (Environmental Entrepreneurs, 2016). Wind projects produce jobs in different ways: direct, indirect, and induced. Direct jobs refer to the labor created directly by the construction, operations and maintenance of the wind farms. Indirect jobs include supporting industries, like manufacturing; component suppliers; and jobs, like attorneys and analysts. Induced jobs include those created by the investment and reinvestment of earnings locally, such as hotels, restaurants, retail, real estate, etc. (National Renewable Energy Laboratory, 2016).

1.2 Short-Term Job Creation

Construction Jobs

Construction-related employment for a wind power project usually involves short-term assignments that vary depending on size and location of the project. Typical construction lasts anywhere from six months to more than a year.

Construction jobs comprise the majority of wind-related job creation. In the United States, a 50 MW wind project will create 40 full-time equivalent jobs during the construction period.²

Typically, the wind developer will hire a general contractor to manage the project. The general contractor will then subcontract to specialists in civil work (grading, excavation, concrete etc.), electricians, mechanics, etc. Typical construction jobs may include construction managers, heavy equipment operators, and general laborers.

Professional Services

Supporting jobs include environmental professionals who can carry out environmental impact assessments, lawyers who support the siting and permitting process, and bankers who structure and support the financing of projects. During the predevelopment and construction phase there are many jobs created in supporting roles. Depending on the project, some of these roles may also continue into the operation and maintenance phase.

This work may be provided by local workers depending on their skillset and experience. This is especially relevant for any jobs that require localized knowledge, such as conducting environmental impact assessments and navigating local processes, such as siting and permitting.

Manufacturing Jobs

Manufacturing occurs before, during, and after the construction phase of a wind project. The majority of the manufacturing takes place during the early stages, when the wind turbines and their components are manufactured and assembled. Once the project is installed, there will be some part and component manufacturing over the lifetime of the project to repair or replace parts as needed.

Wind turbine and component manufacturing is a growing industry in the United States. The majority of commercial wind turbines sold in the U.S. are manufactured domestically or in Europe. The employment resulting from component manufacturing can be significant. Studies have shown that as a state's wind market grows, so do manufacturing jobs (Halvatzis & Keyser, 2013) (See Box 1).

As of 2020, the American Wind Energy Association (AWEA) found more than 500 wind-related manufacturing facilities across almost every state in the U.S. Manufacturers sometimes source individual components—cabling, transformers, concrete—locally, depending on local skills and resources. New York State has twelve active manufacturing facilities that produce products for the wind industry (AWEA, 2020).

Box 1. Examples of Job Creation from Wind Power Projects

- A study by National Renewable Energy Laboratory (NREL) looked at job creation in Iowa, which ranked second in wind capacity of U.S. states. From the first 1,000 MW (out of 4,525 MW) of wind capacity installed, 2,300 full-time equivalent (FTE) jobs were added during construction. The industry also created 270 permanent jobs, including 75 on-site positions, 105 equipment and supply jobs, and the remainder in other sectors (Halvatzis & Keyser, 2013). The study also found that, while in-state manufacturing was fairly low during this period, it grew rapidly as wind capacity increased, resulting in the addition of 2,000 wind manufacturing jobs.
- As of 2020, New York hosts nearly 2,000 MW of windpower, and ranks 15th in the nation for installed capacity (AWEA, 2020). NYSERDA's [2019 New York Clean Energy Industry Report](#) found the State's wind industry supported nearly 3,500 jobs.³

1.3 Long-Term Job Creation

Operations and Maintenance Jobs

Operations and maintenance are required for the duration of the life of the wind project, which ranges from 20 to 30 years.

The number of people employed by a wind power project during commercial operation depends primarily on the project size and administrative structure. Small projects are generally remotely operated and only bring in maintenance personnel when required. Larger projects will have a full-time operations and maintenance staff, the size of which depends on the project size, turbine type, and local labor practices. Approximately two wind technician jobs are created for every 10 to 20 turbines.

Operation and maintenance jobs usually require skilled professionals. Operators are usually project managers who have computer, inventory management, job and equipment scheduling, record-keeping, and data-processing and analysis skills. Maintenance workers often have mechanical and/or electrical proficiency, and are able to perform extensive physical labor, such as climbing and lifting.

Wind projects are often staffed with local personnel with an experienced supervisor or facility manager supporting the employees. Local workers with relevant skills and training, such as experience in the mechanical or electrical trades, can readily be trained in wind power mechanical and electrical systems and maintenance of equipment. Specialized turbine training is often provided by the turbine manufacturer.

2. Land Revenue

The development of a wind project can provide an additional source of income to rural land owners from leasing and royalty agreements. Since only a fraction of this land is utilized by physical plant structures and roads, the previous use of the land (e.g., farming or dairy operations) can continue alongside the wind power facility.

Depending on the placement of turbines on one or more properties, the project may directly benefit one or more landowners through lease payments and production royalties. In addition to these direct benefits, the broader community may benefit. This is due to multiplier effects associated with the increased income of the host landowners and long-term stability of those landowners, who have diversified their sources of income.

Note: For more on land-use agreements and revenue, please see the Land Agreements section (p. 35).

3. Property Taxes and Host Community Agreements

Wind energy projects typically contribute to local government revenues through tax collections or other local benefit agreements. When considering the different approaches or mechanisms used to establish payments to local governments, the magnitude of the payments should be comparable to the costs associated with additional services required by the project, while providing a reasonable benefit to the larger community. For many small towns, payments from wind energy projects result in a significant increase in revenue compared to other local revenue sources.

Some jurisdictions have limited or exempted local taxation of wind energy projects to induce development and increase economic diversity. Other forms of stimulus may include business or corporate incentives for establishing manufacturing or company headquarters in a region or state.

3.1 Wind Project Exemption

Payment of additional property taxes on improvements associated with wind turbines is exempt for a period of 15 years, unless opted-out by the local taxing jurisdiction (New York State Real Property Tax Law, §487). The current exemption law is set to expire on December 31, 2024. The exemption is at the discretion of the local taxing jurisdiction—while local taxing districts have generally granted the exemption, this has not always been the case.

The operating life of the wind turbine may exceed the 15-year tax exemption period. Municipalities should plan ahead for revenue beyond the fifteenth year of the project and determine if the project will be decommissioned or upgraded after 15 to 20 years.

This exemption applies to county, city, town, village, and school taxing jurisdictions but does not apply to special-use districts, such as fire districts.

Any county, city, town, village, or school district⁴ may actively retract this exemption by adopting a local law or school district resolution to disallow it. This tax exemption has become a significant negotiation issue between project developers and local taxing jurisdictions. Taxing jurisdictions that have not disallowed the exemption can do so at any time prior to the turbines being constructed, making the project pay its full tax burden. Local governments can use this provision as leverage to negotiate a voluntary payment with the developers.

3.2 Payments-in-Lieu-of-Taxes

County, city, town, village, and school district taxing jurisdictions that do not retract the exemption may enter into an agreement for payments-in-lieu-of-taxes (PILOTs) with the owner of the wind turbine equipment (project owner). PILOT agreements are common practice in all types of development projects, not just wind energy. Several taxing jurisdictions can be parties to the same agreement—each taxing jurisdiction does not have to enter into its own PILOT with the project owner. If multiple jurisdictions are parties to the agreement, the PILOT agreement defines the amount the project owner pays each taxing jurisdiction. Frequently, the county Industrial Development Agency (IDA) negotiates the PILOT on behalf of the relevant taxing jurisdictions. The agreements may be written by the county or local taxing jurisdiction's tax counsel.

The payment amount is paid in lieu of property taxes due on the equipment and improvements to the land. PILOT amounts cannot exceed the amount that would be due if property taxes associated with the improvement were not exempt and the agreement cannot continue for more than 15 years. PILOT agreements negotiated through the county IDA can exceed this 15-year term. PILOT agreements cover the amount to be paid and how it is distributed among the different parties to the agreement, but do not include language on how these funds may be expended. After the agreement expires, the wind project owner is responsible for paying the property tax assessment required by the taxing jurisdictions. Wind project developers and taxing jurisdictions may want to estimate the potential future property taxes after the agreement expires, so wind developers and taxing jurisdictions can plan accordingly.

Common PILOT Payment Structure

Specific guidelines for determining the magnitude of PILOTs do not exist, except for the provision that payments may not exceed what would have been owed had the equipment been assessed under ordinary tax provisions. A common structure is a dollar-per-installed-capacity amount, often in megawatts (MW).⁵ Box 2 provides two examples of wind power project PILOTs in the State.

Box 2. Examples of Wind Power Project PILOTs in New York State

- According to publicly available information, the town of Fenner receives approximately \$150,000 per year for 15 years, or approximately \$5,000 per installed MW for the Fenner Wind Power Project.
- The 77.7 MW Jericho Rise Wind Farm, a more recent project, finalized a [PILOT](#)⁶ with the IDA of Franklin County for the Towns of Chateaugay, Belmont, and Franklin County and the Chateaugay Central School District to share payments of \$4,000 per megawatt per year, approximately \$310,000 in total. The school district will receive the majority of the PILOT money, 59%, or about \$183,000, with the county receiving 13%, about \$40,000, and the towns splitting the remaining 28%, which equals about \$87,000.

Host Community Agreements

Oftentimes the project's full financial contribution to the host community is split between the PILOT agreement and a Host Community Agreement (HCA). HCAs are a mechanism by which the local jurisdiction and developer agree on each party's rights and obligations during the construction, operation, and decommissioning of a wind energy project. HCAs may govern items such as liability, inspection and monitoring during construction, road use and reconstruction, emergency preparedness and fire prevention, complaint management, and turbine decommissioning. HCAs typically direct a financial contribution to a local governing body in excess to the amount received solely through the PILOT. HCAs can be structured in several ways to direct benefits to the locality but typically include an annual payment set on a dollar per installed capacity basis. The sum of the PILOT rate per MW and the HCA rate per MW reflects the total financial contribution the project is making to the local community. Therefore, in situations where an HCA is utilized, the PILOT rate will be lower than situations in which no HCA is in place.

4. Property Value

Property owners often want to understand how a wind project will impact their property value. Depending on their involvement with a wind project, property owners usually have different concerns:

- **Properties on which the wind project will be developed.** Property owners usually lease their land to the wind developer and receive lease payments over the lifetime of the system. These payments can increase property values.
- **Properties neighboring or in proximity to the wind project.** Property owners are often concerned that the wind project will decrease their property values.

Property values can also be impacted during different periods of a wind project's development, including post announcement, preconstruction, and post construction.

In general, only limited research on the impact of wind farms on property values is available. Such research examines trends in sales transactions. Data and studies for homes that are adjacent or are less than 0.5 miles from a wind project are rare. Because most large-scale wind farms are subject to setback requirements ensuring they are built a certain distance from neighboring properties, wind facilities are generally sited in areas with relatively few homes, limiting the number of sales transactions that are available for research (Hoen, Wiser, & Cappers, 2013).

The existing research examining the property values of residential homes located near or with views of wind turbines provides little or no evidence that home values are affected (positively or negatively) before or after the construction of facilities. For example, a study conducted by Hoen et al. in 2013, analyzed data from more than 50,000 home sales across 27 (mostly rural) counties in nine states including seven counties⁷ in New York that were within 0.5 to 10 miles of wind facilities. The study found no statistically significant evidence that home prices near wind turbines were affected in post-announcement, preconstruction, or post-construction periods. The study concluded that if effects do exist, the average impacts are relatively small (within the margin of error for the report, which was +/- 4.9% for homes within 1 to 10 miles, and +/- 9% for homes within .5 miles from a wind facility) and/or sporadic, impacting only a very small subset of homes.

A similar 2014 study examined 122,000 homes sales near 41 turbines located in more densely populated areas in Massachusetts within five miles of wind facilities. The study concluded there were no net effects on property values due to wind turbines. The study found only weak statistical evidence that the announcement of a wind facility had a modest adverse impact on home prices, and such impacts were no longer apparent after turbine construction and operation commenced (Hoen & Atkinson-Palombo, 2014).

References

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Additional Resources

- Economic Development Impacts of Community Wind Projects: A Review and Empirical Evaluation <https://www.nrel.gov/docs/fy09osti/45555.pdf>
- Law of the Wind: A Guide to Business and Legal Issues <https://www.stoel.com/legal-insights/special-reports/the-law-of-wind>
- Understanding the Property Tax Exemption for New York <https://www.youtube.com/watch?v=A3Ull1-T0k>
- Recently Asked Questions About the Real Property Tax on the Topic of Solar Energy Systems <https://www.tax.ny.gov/pdf/publications/orpts/legal/raq2-18.pdf>
- Solar and Wind Energy Systems: Definitions and Guidelines for Property Tax Exemptions https://www.tax.ny.gov/pdf/publications/orpts/manuals/vol4/solar_report.pdf
- New York State Real Property Tax Law §487 https://www.tax.ny.gov/research/property/assess/manuals/vol4/pt1/sec4_01/sec487.htm
- Exemption Administration Manual - Part 1. Residential - Other Than Multiple Dwellings https://www.tax.ny.gov/research/property/assess/manuals/vol4/pt1/sec4_01/sec421_b.htm
- Analysis: Economic Impacts of Wind Applications in Rural Communities <https://www.nrel.gov/docs/fy06osti/39099.pdf>
- Research Brief: Property Tax Exemptions in New York State https://www.osc.state.ny.us/localgov/pubs/research/propertytax_exemptions.pdf
- Host Community Agreements for Wind Farm Development <https://www.albanylaw.edu/centers/government-law-center/about/publications/past-publications/Documents/Host%20Community%20Agreements%20for%20Wind%20Farm%20Development.pdf>

Questions?

If you have any questions regarding economic impacts, please email questions to cleanenergyhelp@nyserda.ny.gov or request free technical assistance at nyserda.ny.gov/Siting. The NYSERDA team looks forward to partnering with communities across the State to help them meet their clean energy goals.

Section End Notes

¹ <https://www.nyserda.ny.gov/-/media/Files/EDPPP/Energy-and-Environmental-Markets/RPS/RPS-Documents/2013/2013-RPS-investments-NYS.pdf>

² As construction jobs may be less than full year, these estimates under-represent the total number of people hired.

³ <https://www.nyserda.ny.gov/About/Publications/New-York-Clean-Energy-Industry-Report>

⁴ With the exception of the city school districts of New York, Buffalo, Rochester, Syracuse, and Yonkers, which cannot retract the exemption.

⁵ An alternative method would be to base payments on the electric generation from the project (measured in MWhs). Wind energy generation will vary from year to year, and the project could temporarily go off line for repairs or due to damage. Under this alternative arrangement, payment amounts will vary every year. This alternative method places production risk on the municipality and makes year-by-year PILOT payment amounts less certain.

⁶ http://www.franklinida.org/files/public/pdf/Jericho_Rise_Wind_Farm_LLC/Memov4-Impact_Analysis-JerichoRise.pdf

⁷ The seven counties included Clinton, Franklin, Herkimer, Lewis, Madison, Steuben, and Wyoming.