

Reaping the Rewards of Wind Power



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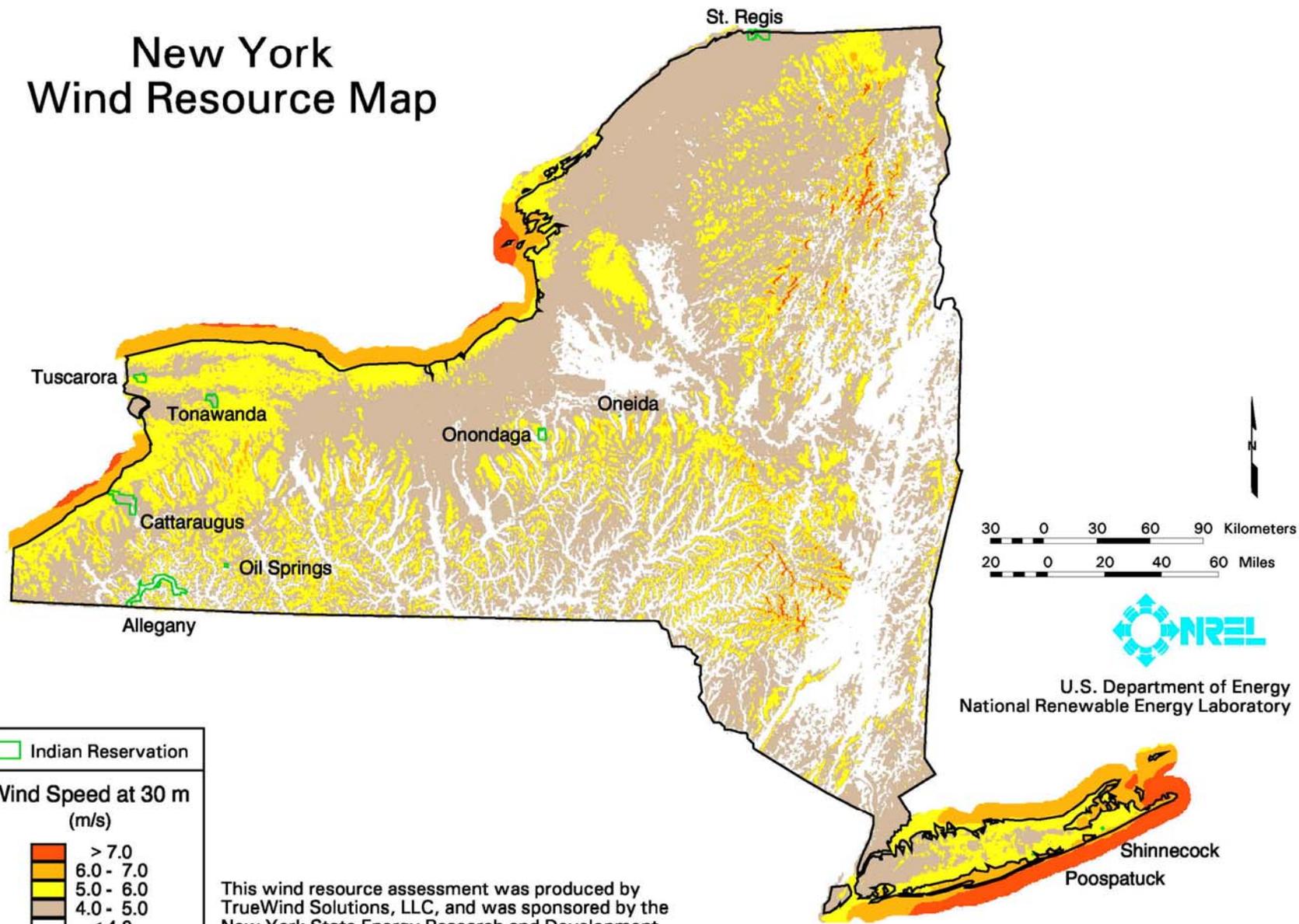
NYSERDA Snapshot

- Public Benefit Corporation
 - Energy, Environment, Economy
 - Market Driven
 - Risk Reduction Investments
- Research & Development, Energy Analysis, Energy Efficiency Services Deployment
- Steward of the New York State Systems Benefit Charge and Renewable Portfolio Standards Programs

Why are We Interested in Wind Energy?

- Helps us achieve a cleaner and healthier environment
- Increases energy diversity:
 - Reduces use of imported fossil fuels
 - Helps ease fuel availability problems in winter
 - Helps protect against fossil fuel price increases
- There is significant wind potential
- Costs of wind power have declined

New York Wind Resource Map



	Indian Reservation
Wind Speed at 30 m (m/s)	
	> 7.0
	6.0 - 7.0
	5.0 - 6.0
	4.0 - 5.0
	< 4.0

This wind resource assessment was produced by TrueWind Solutions, LLC, and was sponsored by the New York State Energy Research and Development Authority (NYSERDA).


 U.S. Department of Energy
 National Renewable Energy Laboratory



Large Wind Turbines

- Over 600kW; typically 1.5 to 1.8 MW
- Tower heights usually between 200 and 260 ft
- Electricity sold through wholesale markets
- Usually sited in groups
- Installed by a developer
- Minimum wind speed around 7 m/s or 15.75 miles per hour
- One 1.5MW turbine produces as much electricity as about 600 homes use.

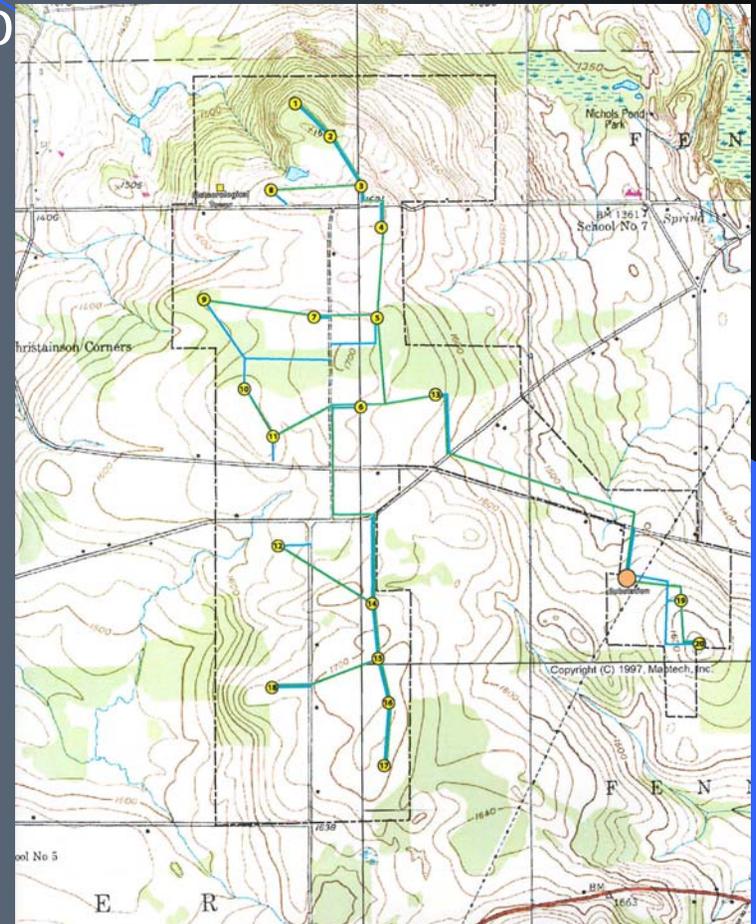
System Benefits Charge Renewable Energy Program

Program Budget is \$71.7 M over 5 years:

- Wholesale Sector \$ 45.5 M
 - Wind Project Development - \$27.5 M
 - Prospecting
 - Project Development
 - Green Retail Marketing - \$18
- Technical Analysis/Market Mechanics/Outreach – \$2 M

NYSERDA Wind Project Development Program

- \$17M in NYSERDA funds allotted to be paid as production incentive payments
- 456 MW of capacity - roughly 304 turbines
- expect some to be operating in 2005
- financing dependent on federal tax incentives, renewable portfolio standard design/implementation and/or power sales contracts



Fenner Project Turbine Layout

Prospecting Activities

- Renewable Power and Resource Prospecting

- Support technology feasibility and assessments and build portfolio of RPS eligible renewable energy production facilities

- NYSERDA funds up to \$200,000 per contract; \$4,000,000 for program; 50% cost sharing required; 2nd round proposals submitted January 2005

- Community Wind Prospect Development

- Working with 2 communities to facilitate wind development in their communities

- Up to \$50,000 of NYSERDA funding per project



NYSERDA Green Marketing Program

- Community Energy with NYSEG (2002)
 - 12+MW sold in year 1; 90 MW to be sold by year 5
 - nearly \$ 4 M budgeted for contract activities
- 3 programs started in 2003:
 - nearly \$ 6 M budgeted for contracts
 - Community Energy/ConEdSolutions; Sterling Planet/Agway; Green Mountain Energy
 - 10 MW in year 1 growing to 190 MW by year 5
- Expect about 280MW after 5 yrs



NY Renewable Portfolio Standard

- 25 % of electrical load requirements to be satisfied by eligible renewable resources over 10 years
- Existing renewable resources count (approx. 17% of the requirement); remaining 8 % must be satisfied by new renewable resources
- First RFP issued January 2005 for attributes from 1,400,000 MWH of renewables to be in-service by December 2005



Wind Turbine Requirements Potential

	2005 (GWH)	2006 (GWH)	2010 (GWH)	2014 (GWH)
Total Potential Demand :	4,885	9,377	21,842	31,858
Wind Capacity (MW): @ 50 % market share ; @ 31 % load factor	899	1,726	4,022	5,866
# of Turbines required: @ 1.5 MW/turbine	600	1151	2,681	3,911

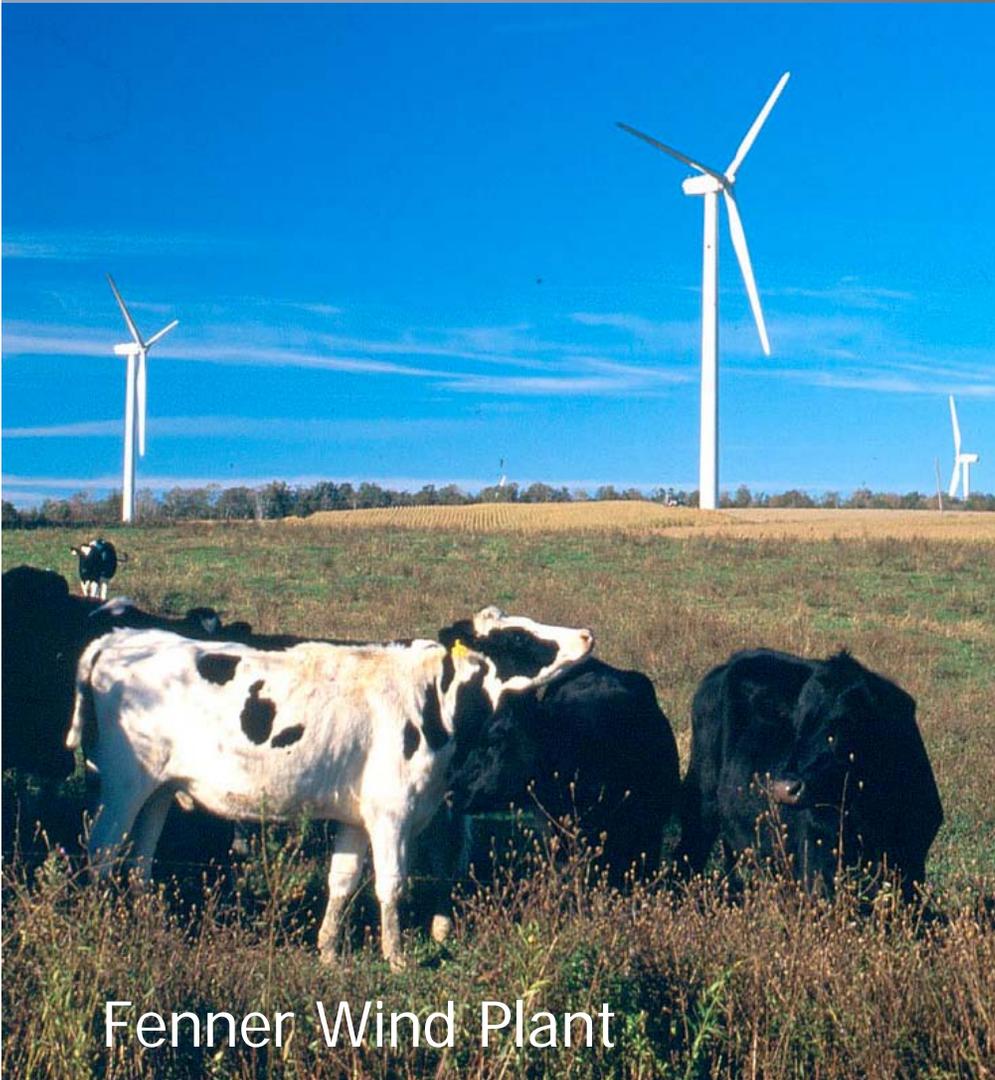
- based on projected renewable markets caused by to green markets;
NY State renewable purchase; NY RPS; NJ RPS; Mass RPS

Wind Plant Development

- Select prospective site
- Arrange wind measurement leases
- Permit and install measurement tower(s)(150 ft)
- Arrange leases to erect and operate turbines
- Assess wildlife, noise, historical, cultural, and visual impacts
- Permit plant
- Construct, operate and maintain project



Potential Economic Implications



Fenner Wind Plant

Land required to be under lease:

- by 2006: about 60,000 acres
- by 2013: about 200,000 acres

Land/Turbine lease rents to landowners:

- by 2006: nearly \$ 3,500,000/yr
- by 2014: nearly \$ 12,000,000/yr

Local community revenues:

- by 2006; nearly \$ 9,000,000/yr
- by 2014; nearly \$ 30,000,000/yr

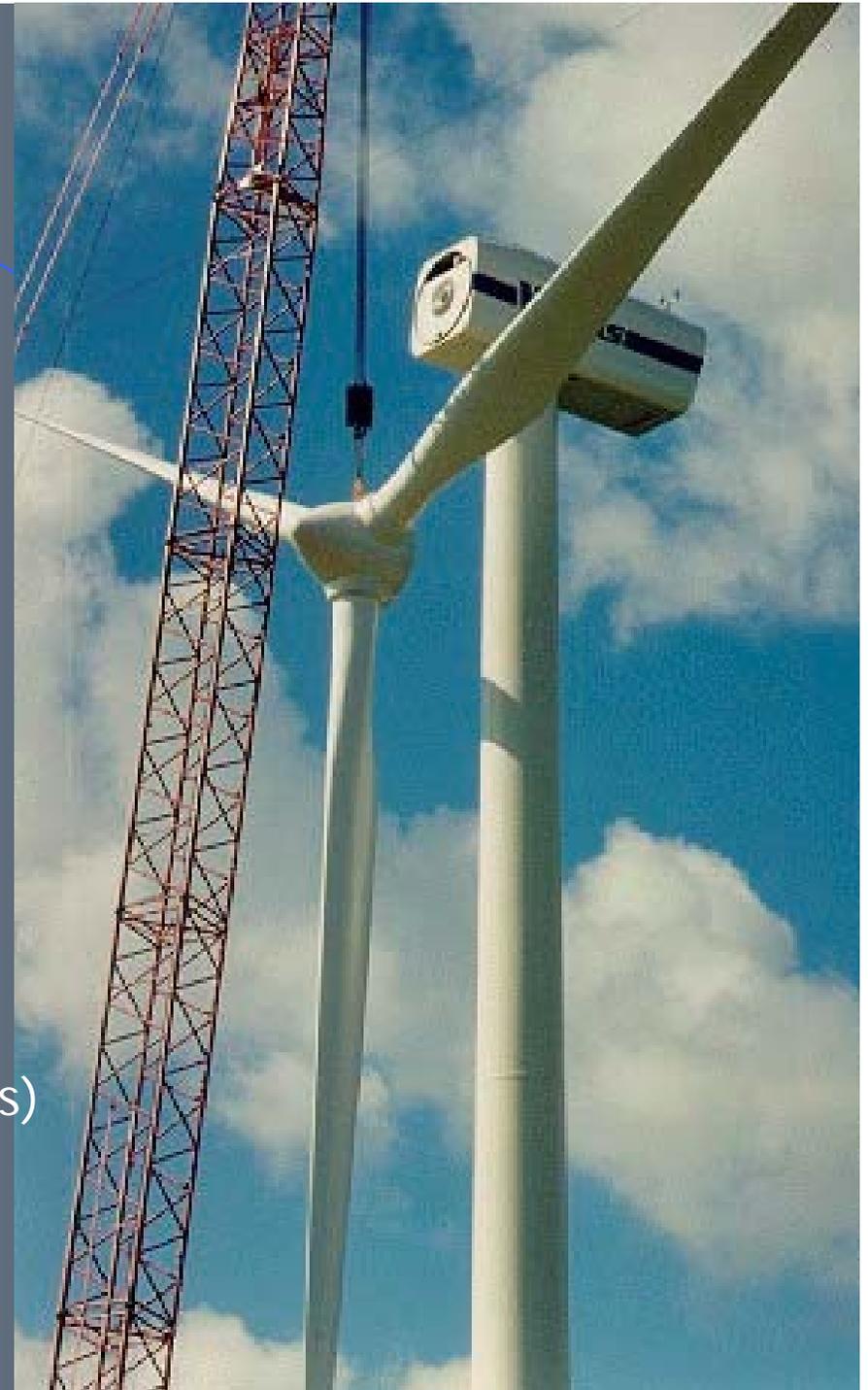
Local permanent employment increases:

- by 2006: 115 new jobs
- by 2014: another 284 jobs

Typical rewards at local level...

Potential Impacts of a 30 MW project:

- 20 wind turbines
- 1,000 acres required; of this, 50 acres will be used; the rest is available for farming
- ~~approx \$2,000 per turbine/\$60,000 possible~~
- production-based royalties possible (small % of project revenues)
- revenues to community of 5,000/MW annually or \$150,000



Contingent on satisfying certain interests...

- Local permitting authorities (some communities have no zoning ... projects only need building permit!)
- NYS DEC (if wetlands are present)
- NYS PSC (only if 80 MW or greater and only if Article X siting Law renewed; or high voltage transmission is required)
- State Historic Preservation and Parks (SHPPPO)
 - Visual impact on historic/cultural structures
 - Archeology
- NYS Department of Agriculture and Markets (non-binding)
 - Minimize impacts on normal farming operations

Some of the Issues Considered During Permitting ...

- Setbacks
- Avian mortality/wildlife impacts
- Migratory bird treaty compliance
- Use of strobe lighting for turbines
- Town road impacts and restoration
- Cultural and aesthetic impacts
- Noise impacts



All complicated by ...



Social-political realities:

- Increase in part-time residents
- Shifts in political control ("native" vs "non-natives")
- Localities govern permitting process (public is divided)

Developer behaviors...

- Stealth in securing land options
- Competition between developers for land in same locality
- Changing project footprints shift impacts between neighbors
- Differing compensation for land owners

With some unfortunate outcomes...

- Local moratoriums
- Turnover in elected officials
- Frustrated farmers/landowners
- Lack of information
- Unbalanced perspectives



The good news...

- New York enjoys a good wind resource relative to neighboring markets
- For the most part, New Yorkers want cleaner energy
- NYS public policy initiatives such as deregulation, systems benefit programs (NYSERDA SBC) and tax law exemptions reflect a strong preference for the development of clean energy markets.
- Growth of private green retail markets, development of innovative trading practices and implementation of NYS RPS mandate substantially increases regional market demand for wind energy.

Work is needed at the community level to educate the public and officials and bring various positions into balance if local approvals are to be obtained and expectations as to wind penetration, green marketing and RPS compliance are to become a reality.



For More Information on Wind:

- NYSERDA's Renewables Programs
 - www.PowerNaturally.org
- American Wind Energy Association
 - www.awea.org
- Wind Power New York
 - www.awea.org/wpny/index.html
- New York Wind Map
 - www.truewind.com
- Windustry
 - www.windustry.org