

MUNICIPAL REGULATION OF WIND ENERGY FACILITIES

New York State Department of State
Office of Coastal, Local Government, and Community Sustainability

Overview of presentation



- Role of wind energy in NY
- Residential, agricultural & commercial systems
- Regulatory Tools
- Concerns and mitigations
- State Agency resources

Role of wind energy in NY

- NYS Renewable Portfolio Standard goal increases renewable energy from current level of 19% to 30% by 2015
- Wind energy is expected to play a significant role
- Cleaner Environment
- Energy Diversity
- Significant wind potential exists
 - 20% of state demand can be met
- RPS online: www.dps.state.ny.us/03e0188.htm

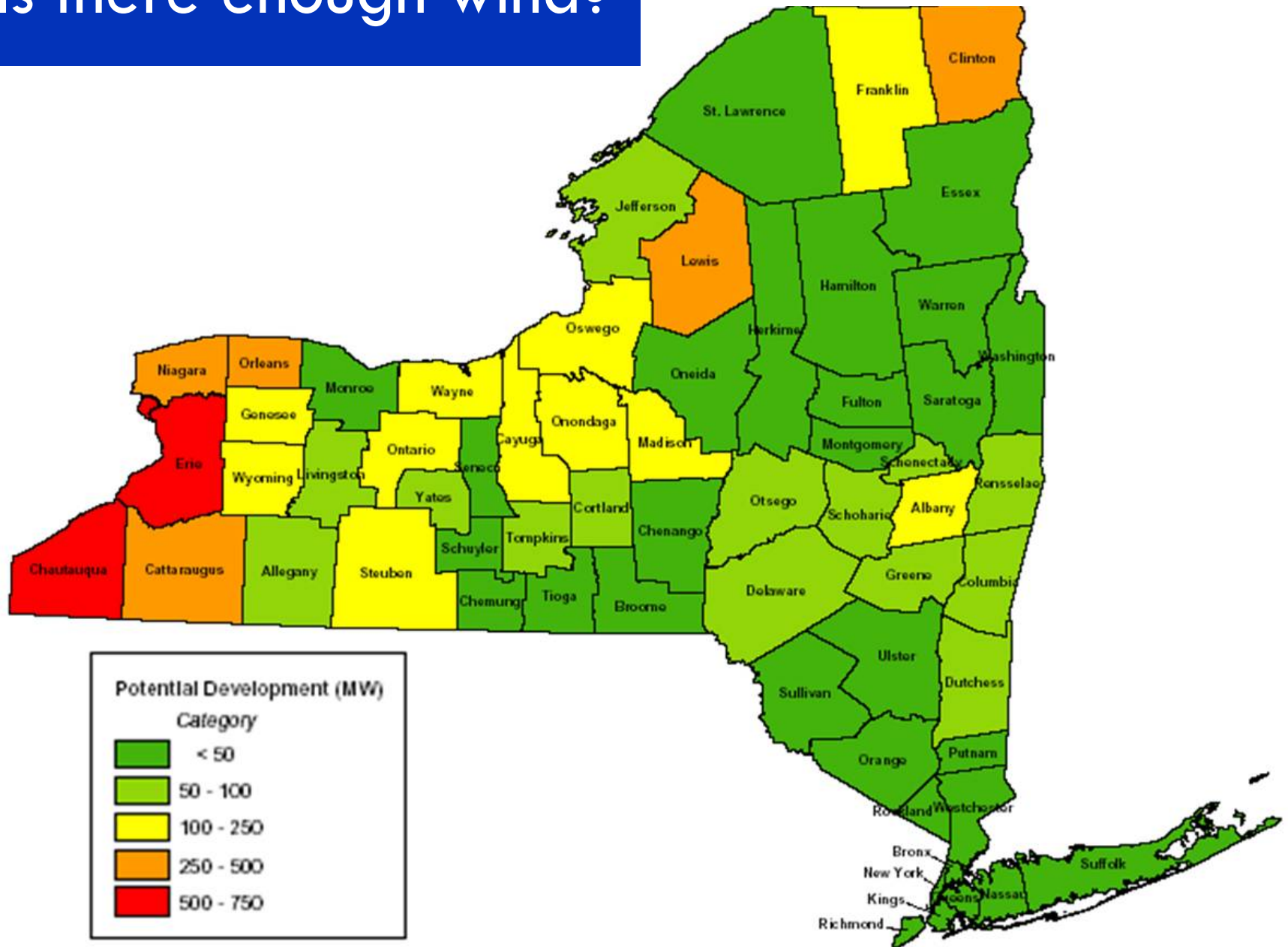
NYS clean energy goals

- Investment in Renewable Energy
 - Propose power plant siting legislation that creates an expedited review process for new wind power projects
 - Invest \$295M in renewable energy projects
- Energy Efficiency
 - Create new appliance efficiency standards
 - Set more rigorous energy building codes
- “45 by 15” Plan
 - By 2015, NY will meet 45% of its electricity needs through renewable energy
 - 15% Reduction in electricity use
 - Increase renewable energy use to a total of 30% of all energy use (RPS)

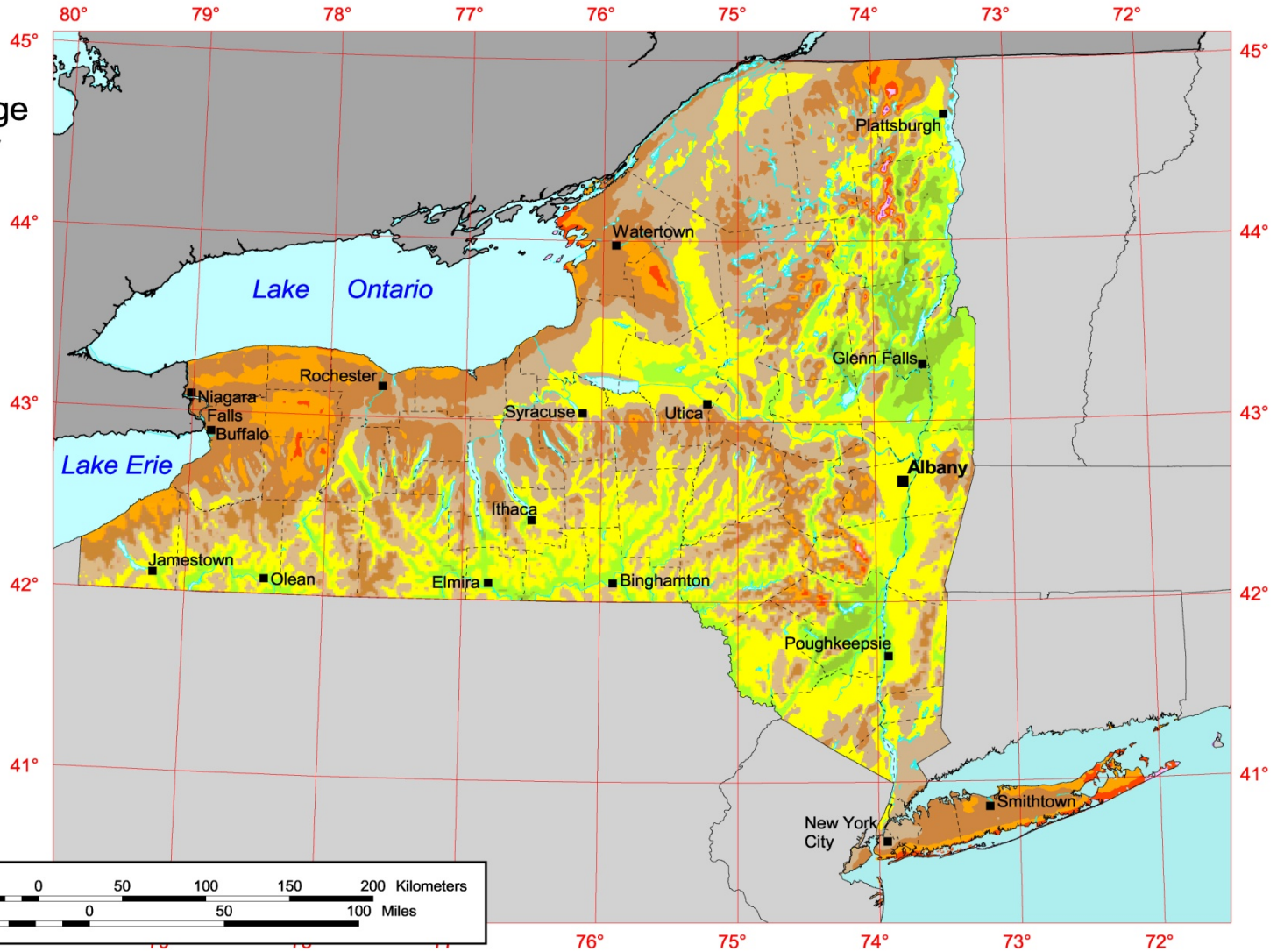
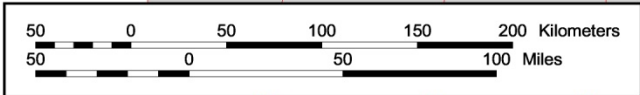
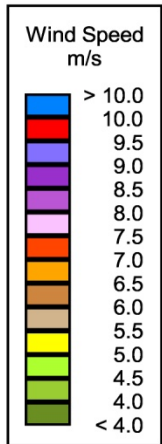
Wind industry ethics code

- Prohibits conflicts of interest between municipal officials and wind companies
- Establishes vast new public disclosure requirements
- New Task Force to monitor and ensure compliance
- First companies to comply were Noble Environmental Power and First Wind

Is there enough wind?



New York Annual Average Wind Power at 80 m



Source: Wind resource estimates developed by AWS Truewind, LLC for windNavigator®. Web: <http://navigator.awstruewind.com> | www.awstruewind.com. Spatial resolution of wind resource data: 2.5 km. Projection: UTM Zone 18 WGS84.

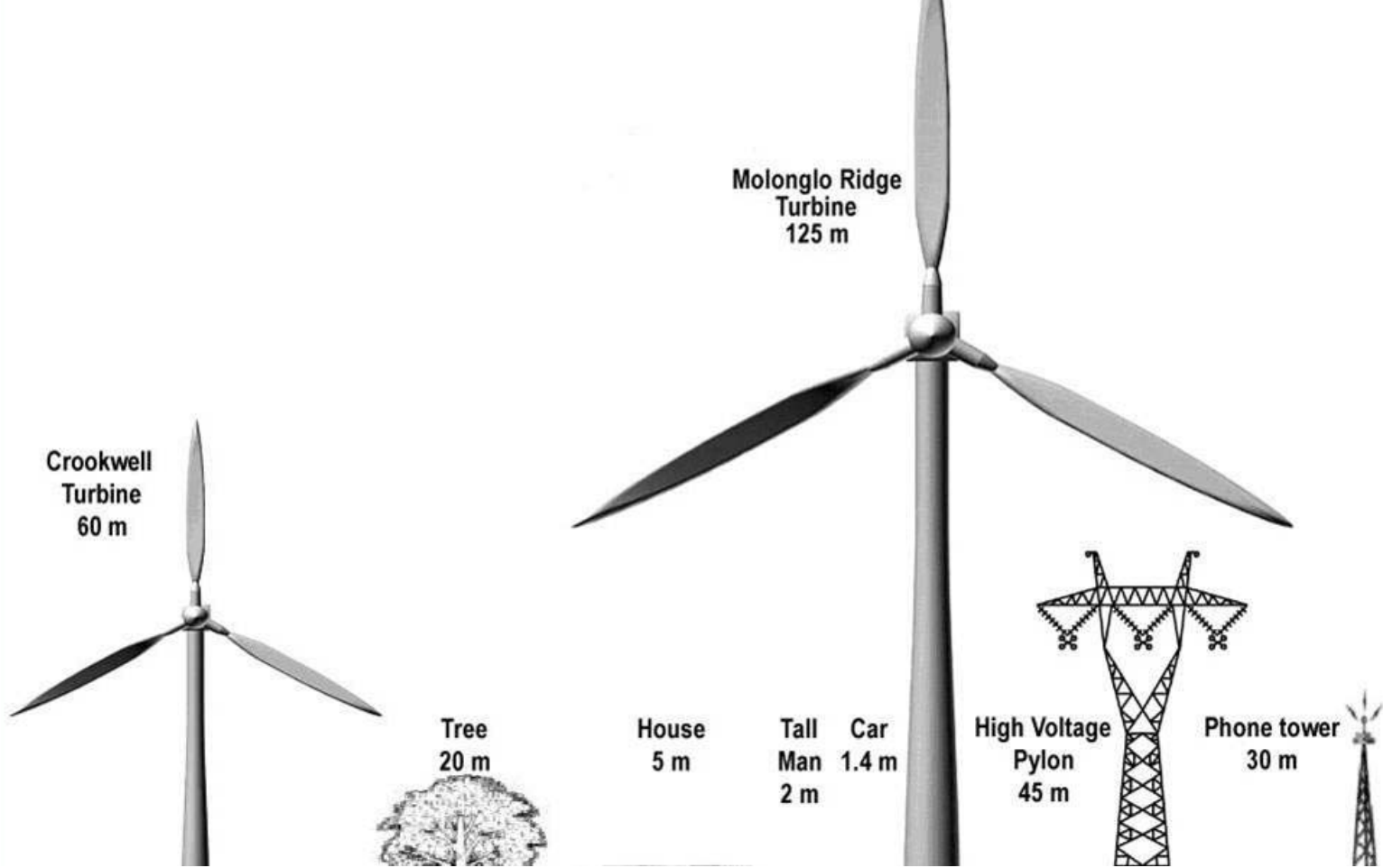


Types of Wind Energy Systems

Residential

Agricultural

Commercial



Relative Size of Large Wind Towers



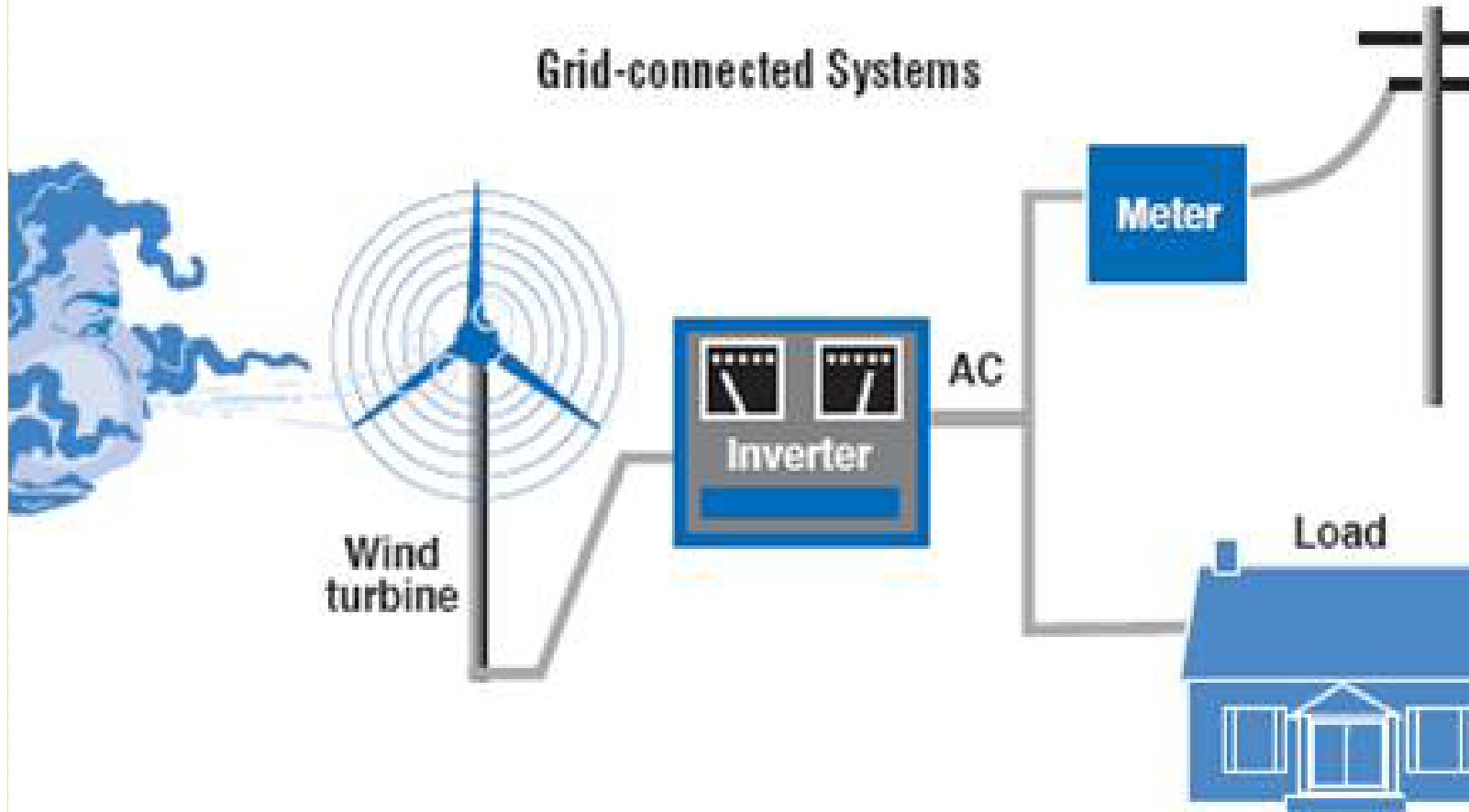
Residential Systems

Residential Wind Systems ≤ 50 kW

- Homes, farms, remote applications such as water pumping, telecom sites
- Installed off-grid or at on-grid facilities
- Economic viability requires 9 mph avg. wind speed
- Typical home system costs approximately \$32,000 (10 kW); a comparable photovoltaic [PV] solar system costs over \$80,000)



Grid-connected Systems



Net Metering

Customers' electric meters turn backwards when generators are producing more energy than customers' demand

Agricultural Systems



Agricultural wind systems >40 kW

- System can meet the needs of an entire farm, or can be targeted to specific applications
- More efficient and reliable than the old water-pumping fan-bladed windmills
- May be cheaper than extending power lines
- More convenient and cheaper than diesel generators



Agriculture

Concern

- Damage to soil disturbed during construction
- Permanent loss of productive land



Mitigation

- Precautions during construction
- Collect top soils and separate for reuse after construction
- Avoid compaction of soils by construction equipment
- Proper siting minimizes land lost

Agricultural considerations for siting

- Avoid dividing larger fields by locating structures and access roads along the edge of farm fields
- Reduce new access road drainage problems
 - ▣ Locate along ridge tops to eliminate need to cut and fill
 - ▣ Construct road surfaces level with adjacent field surface
- Avoid existing drainage and erosion control structures or take measures to maintain their design and effectiveness

Special treatment for on-farm use

- May be considered common farming practice in state agricultural district
- No official determination by Commissioner of Ag & Markets
- Still can be reasonably regulated locally by right or special use permit
- Ag & Markets can assist with drafting local law



Commercial Systems

Commercial Wind Systems ≥ 1.5 MW

- Central station wind farms, distributed power
- Energy sold in power markets
- Height ranges from 213 – 236' at nacelle, with maximum height about 300 – 400' at blade tip
- Economic viability requires 16 mph avg. wind speed
- Wind Farms range in size from 20 - 300 MW



Potential Wind Farm Impacts

Positive

- Renewable energy without emissions or hazardous waste
- Local employment in a potentially long-term industry
- Increases municipal tax base/PILOT payments
- Potential second income for landowners/farmers through land rental
- Harmonious with existing agriculture practices
- Supports agricultural land restoration

Potential Wind Farm Impacts

Negative

- ❑ Visually intrusive
- ❑ Wildlife habitat disruption
- ❑ Bird and bat injury or death
- ❑ Shadow or flicker effects
- ❑ Noise
- ❑ Ice throw



Economic Impact (Estimated)

- Typical 2 year construction project
 - ▣ Employs local and non-local workers
 - ▣ Operations & maintenance permanent jobs
 - ▣ \$45,000 to \$75,000/year in payroll & benefits
- Worker spending on services
- Construction spending on materials
- Payment In Lieu of Taxes (PILOT)
 - ▣ Typically 15 year term; some assessment & revenue thereafter
 - ▣ \$3,000 to \$5,000/year
- Landowner revenue
 - ▣ \$4,000 to \$8,000/year

Regulatory Tools

Comprehensive planning

Moratoria

Site plan review

Zoning

SEQRA

Comprehensive Planning

- Basis for zoning and other land use regulations
- Enlist early and significant public involvement
- Consider regional or multi-municipal efforts
- Identify significant wind resources and determine support for wind energy projects
- Identify visual resources that should be protected
- Adoption of wind ordinance that reflects community's sentiment towards wind development will help to avoid future conflicts

To promote wind development...

Sample goal:

- “To protect high-priority wind energy sites for wind energy development.”

Sample action to achieve goal:

- “Revise the zoning ordinance to permit wind energy facilities.”



To prevent wind development...

Sample goal:

- “To preserve the natural habitat by preventing the development of energy projects that are inconsistent with community’s values.”

Sample action to achieve goal:

- “Create a wind ordinance, or revising an existing one, to preclude the development of future wind projects.”



Moratoria

- Adoption allows for planning and development of regulations
- Defines period of time while working on plan and/or regulations
- Consider exempting meteorological “met” towers so data collection can continue or allowing by special use permit

Met or Meteorological Towers

- Site map
- Applicant identification information
- Written permission of land owner
- Require all equipment removal and site restoration after wind site assessment
- Proof of applicant's public liability insurance



Regulation without zoning

- No prohibition of **use**
- Site plan review
- Noise control laws



Site Plan Review

- Can be used with or without zoning
- Develop submission requirements
 - ▣ Survey of property
 - ▣ Architectural drawings
 - ▣ Engineering plans and studies
 - ▣ Decommissioning and site restoration plan
 - ▣ SEQRA forms
- Develop clear decision criteria
- Authorize board to charge applicant for expert review

Site plan review elements

- Tower location
- Utility lines
- Safety issues
- Visibility
- Lighting plan
- Maintenance structures
- Tower design data



Regulation with zoning

Prohibit

- Municipal-wide or only specific districts
- Use clear language in regulations
- Prohibit all other uses not listed as permitted

Permit

- Zoning districts
- Wind overlay zones
- Special use permit

Clearly address in regulations

- Test or met towers
 - ▣ Temporary and length of time
- Residential systems
- Agricultural systems in and outside of agricultural districts
- Commercial systems

Establish Measurements

- Maximum tower height
- Minimum lot size
- Maximum noise level
 - ▣ At lot line
 - ▣ At receptor
- Setbacks

Setbacks

- Distance to other structures
 - ▣ Habitable vs. non-inhabited
 - ▣ Lenience for participating land owners
- Distance to property line and roads
 - ▣ Waivers for participating adjacent property owners
- Separation between each tower
 - ▣ Wind capacity and concerns about turbulence
- Consider
 - ▣ Height of windmill
 - ▣ Ice melt hazards
 - ▣ Noise



Setbacks

Local Law No. 3 – 2004 Town of Eden

“...(a) WECS shall be set back from any property line, above ground utility line or other WECS a distance greater than its overall height, including blades. WECs shall also not be placed in front yard of any existing structure.

(b) In the case of cluster development, WECS shall be erected within the common open space area and be set back from all residences a distance greater than Subsection C (12)(a) above.

(c) Contiguous property owners may construct WECS for use in common, provided that the required setback, as defined in Subsection C(12)(A) above, is maintained relative to the property lines of non-participant owners.”

State Environmental Quality Review Act

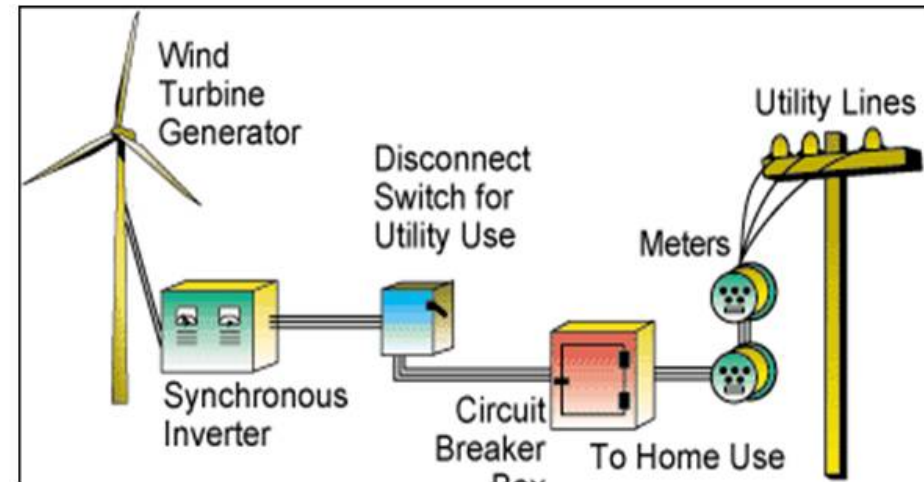
- Most wind projects are subject to review under SEQRA
- Process typically begins with permit application
- In most cases local planning board will manage process as "lead agency"
- Most projects are designated as Type I or unlisted actions under SEQRA
- Environmental Assessment Form (EAF) for lead agency should include Visual EAF Addendum

Wind facility as a public utility

- Local laws or ordinances may define a “public utility” to include or exclude WECS
- If facility is NOT deemed a “public utility” under zoning, applicant must meet statutory test for use variance
- If facility is deemed a “public utility”, a use variance application should be evaluated under the “public necessity” use variance test

Building code

- Not currently specifically addressed by NYS Uniform Fire Prevention and Building Code
- Local building standards/permits for windmills and ancillary structures
- NYS Standard Interconnection Requirements



www.energy.iastate.edu/renewable/wind/wem/wem-11_legal.html



Concerns & Mitigations

Construction

Concern

- Increased traffic/road maintenance
- Soil erosion
- Stormwater runoff
- Wetlands and stream crossings
- Solid and hazardous waste
- Repowering and decommissioning
- Liability

Mitigation

- Reinforce or widen roads
- Minimize grading, limit soil disruption, keep existing vegetation, prohibit off road vehicle travel
- Stormwater guidelines
- Wetland permits (DEC, Army, APA)
- Collection program for boxes, hydraulic fluids, etc.
- Replace or remove turbines (20 years) & restore original site conditions
- Insurance proof prior to permit

Liability mitigation

Town of Fenner

“Prior to issuance of a Building Permit, the applicant shall provide the Town proof, in the form a duplicate insurance policy or a certificate issued by an insurance company, of liability insurance, of a level to be determined by the Town Board in consultation with the Town’s insurer, to cover damage or injury which might result from the failure of a tower or towers or any part(s) of the generation and transmission facility.”

Ice

Concern

- ❑ Accumulated ice on rotor blades may be shed



Studies of potential danger vary; no reported injuries from turbine ice throws

Mitigation

- ❑ Ice buildup detection systems
- ❑ Increased setbacks (greatest danger under tower)
- ❑ Consider wind speed and direction when locating
- ❑ Post property warning

Noise

Concern

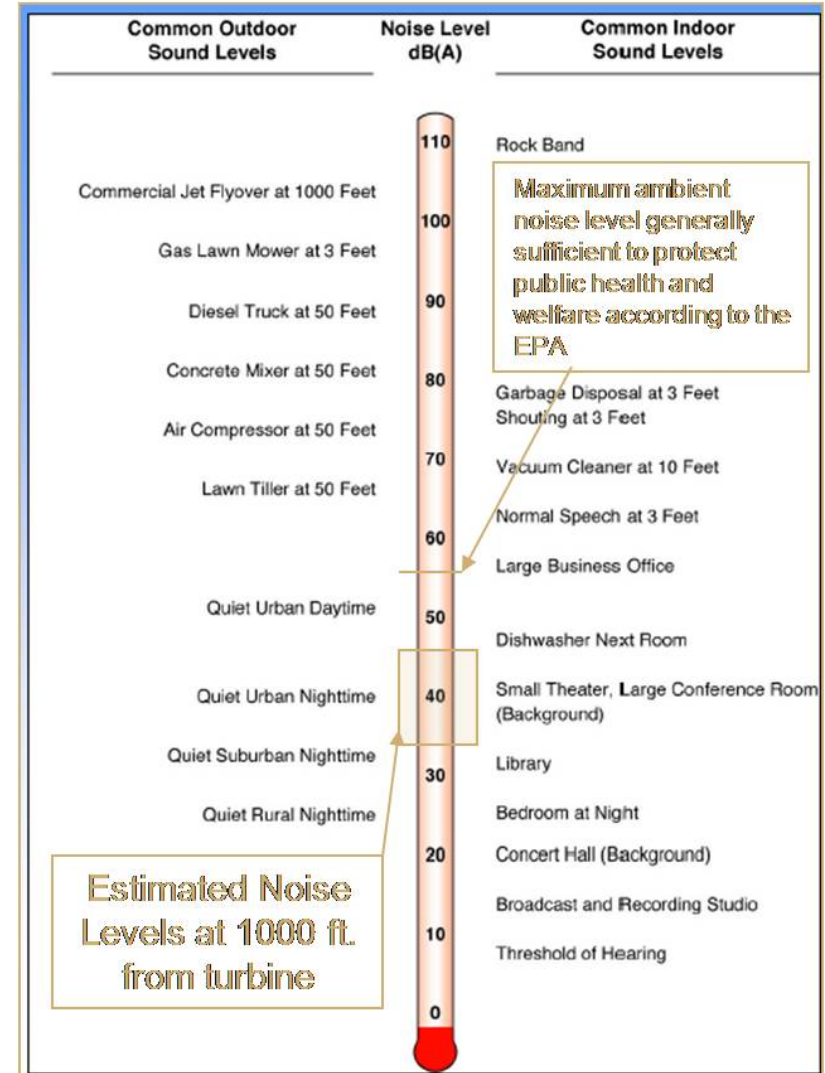
- May cause health complaints
- Disrupts rural “quiet” quality

Mitigation

- Applicant can model expected noise levels
- Setbacks or distance is most effective
- Setbacks based on proximity of certain “receptors” (property line or inhabited house)
- Determine and enforce permitted decibel level at property line or receptor

Noise in context

- Rural areas have unusually low ambient noise levels
- An increase of 6 decibels over ambient noise level at receptor may cause complaints, according to the DEC/EPA
- Usually noisiest at full load



Noise

Town of Westfield, LL2 of 2002

“WECS towers shall be properly maintained and operated at all times and shall be located with relation to property lines so that the noise produced during operation shall not exceed fifty (50) dbA, measured at the boundaries.”

Noise enforcement

Town of Westfield, LL2 of 2002

“After conducting inspection, the Code Enforcement Officer may order owner to render WECS inoperative for reasons related to assuring safety of operations, abating noise, or eliminating electromagnetic interference.

Owner shall not return WECS to service until any and all reasons CEO issued order have been corrected to satisfaction of CEO.”

Electromagnetics

Concern

- Electromagnetic interference (may cause “shadows” in weak TV signals)

Mitigation

- Enhance signal strength; provide alternative receiver
- No towers along major access of existing microwave communications link
- Require applicant to minimize/mitigate signal interference

Electromagnetics mitigation

Town of Portland

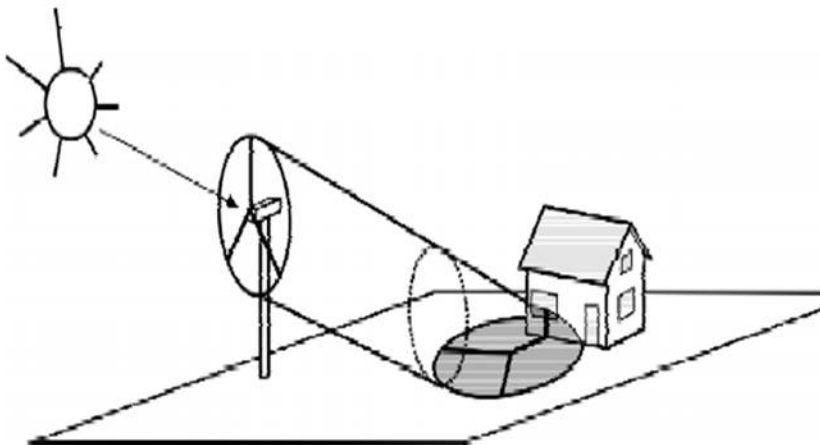
“No individual tower can be installed in any location along the major access of an existing microwave communications link where its operation is likely to produce electromagnetic interference in the links operation.”

“WECS generators and alternators shall be properly filtered and/or shielded in order to avoid EMI and shall comply with FCC regulations contained in 47 CFR Parts 15 and 18”

Shadow flicker

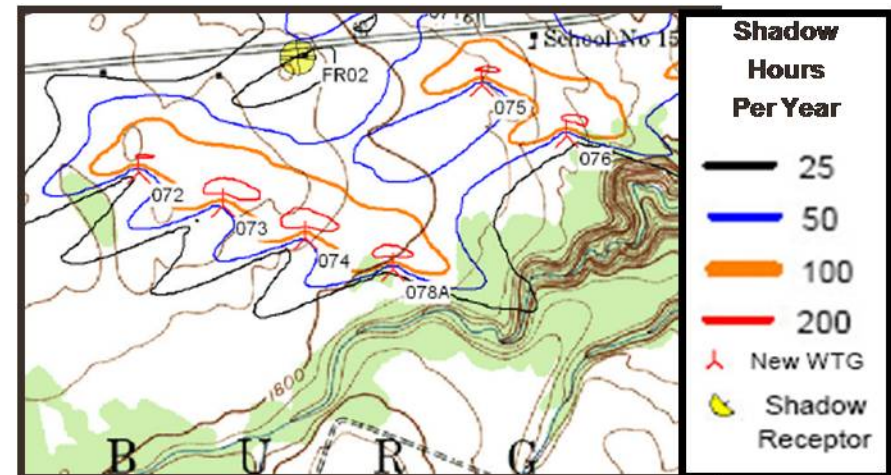
Concern

- Blades cast a moving shadow over nearby windows



Mitigation

- Careful site selection, design and planning
- Program turbine to turn off during certain periods



Birds

Concern

- Avian fatalities



Mitigation

- NYSDEC guidelines for monitoring wildlife mortality (pre/post-development)
- Develop research plan for wind/wildlife projects
- Initiate comparative risk analysis (wind vs. other forms of electricity production)

Bird fatality mitigation

Town of Roxbury, LL3 of 2002

“No individual tower facility shall be installed in any location where there is a recognized migratory flight path for birds or at a location where birds commonly congregate, unless the operation of the wind energy-deriving tower will not have a significant impact on either migratory or resident birds.”

Bats

Concern

- Collisions and fatalities



Mitigation

- Avoid turbines near utility right of ways that cross over mountains (migratory paths)
- Feather blades so rotation is slowed, which could greatly reduce bat strikes
- Close farm when summer storms or warm, low-wind evenings are predicted

Appearance

Concern

- Visually distracting
- Ancillary buildings out of character with community



Mitigation

- Require uniform appearance
- Require power lines be underground
- Require ancillary buildings be made of local materials to harmonize with landscape

Viewsheds

Concern

- Aesthetic or scenic natural beauty disrupted
- Turbines visible up to 1/2 mile away (foreground)



Mitigation

- Require landscape simulations
 - ▣ Balloon tests
 - ▣ Install temporary poles to determine visual impact
- Turbines sited beyond 7 miles are much less visible

Conclusions



- Don't wait for a wind energy project to be submitted to decide where you stand
- Decide through consensus, as much as possible
- Comprehensive planning a good forum to address the issue



State Agency Resources

Department of Environmental Conservation (NYSDEC)

<http://www.dec.ny.gov/energy/40966.html>

- Guidelines for Conducting Bird and Bat Studies at Commercial Wind Energy Projects

www.dec.ny.gov/docs/wildlife_pdf/finwindguide.pdf

- NYSDEC Assessing & Mitigating Visual Impacts

www.dec.ny.gov/docs/permits_ej_operations_pdf/visual2000.pdf

- NYSDEC Assessing & Mitigating Noise Impacts

http://www.dec.ny.gov/docs/permits_ej_operations_pdf/noise2000.pdf

Department of Agriculture & Markets (NYSDAM)

- “Guidelines for Agricultural Mitigation for Windpower Projects”

www.agmkt.state.ny.us/AP/agservices/constructWind.html

- Matt Brower (518)457-2713

Energy Research & Development Agency (NYSERDA)

- Renewables Programs

www.PowerNaturally.org

- Standards for agricultural roads in Prattsburgh Scoping document

www.nyserda.org/pdfs/WFPFinalScope.pdf

- Wind Energy Toolkit (NYSERDA)

www.powernaturally.com/Programs/Wind/toolkit.asp

Office of Parks, Recreation, & Historic Preservation (NYS OPRHP)

- Inventory of historic properties and historic districts that are listed or eligible for listing on the State and National Registers of Historic Places

www.nationalregisterofhistoricplaces.com/

- Inventory of state, national and locally designated scenic and aesthetic resources within the affected area (state parks, forestlands, county and town parks, etc.)

www.nysparks.state.ny.us/historic-sites/default.aspx?tab=1

Contacting the Department of State

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