Town of Bristol
September 14, 2016

Zoning and Local Law Considerations For "Private" Solar & Wind Energy Facilities

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MRB group
ENGINEERING · ARCHITECTURE · GIS · PLANNING
MAPPING · CONSTRUCTION · MANAGEMENT

What's driving interest in renewable energy?

- Wind- Solar – Hydroelectric – Geothermal - Biogas/Biofuels
- National or Personal Energy Independence
- Pollution Reduction –Environmentally Friendly
- Costs Decreasing
- Distributed Generation (strengthens and stabilizes grid)
- National and State (NYSERDA) incentives to stimulate
- Energy Cost Savings

What's driving interest in renewable energy?

In 2014, Governor Andrew M. Cuomo launched "Reforming the Energy Vision (REV)".

- REV will build an integrated energy network able to harness the combined benefits of the central grid with clean, locally generated power.

The 2015 New York State Energy Plan coordinates REV.

2030 clean energy goals:

- 40% reduction in greenhouse gas emissions from 1990 levels
- 50% of energy generation from renewable energy sources
- 600 trillion Btu increase in statewide energy efficiency which equates to a 23% reduction from 2012 in energy consumption in buildings.
- These targets put the State on a path to achieve its longer-term goal of decreasing carbon emissions 80% by 2050.

Taxation of Renewable Energy Systems

- Payment in Lieu of Taxes and/or Host Agreement?
  - Payment of additional property taxes on improvements associated with renewable energy systems are EXEMPT for a period of 15 years under the New York State Real Property Tax Law (RPTL Section 487) unless the local taxing jurisdiction has "opted-out" of that exemption.
  - Taxing jurisdictions that have not disallowed the exemption can do so at any time prior to the system being constructed, thereby making the owner pay the full tax burden.
  - If the Town does not opt-out of RPTL 487, it may enter into a contract for payments in lieu of taxes (PILOT) with the owner.
  - Provides opportunity for Town to accept PILOT as, if based on value, systems may not be feasible if fully taxed.
    - If a property owner installs a wind turbine the accessed value may increase dramatically based on value of turbine.

Net Metering

- Net metering is an enabling policy designed to foster private investment in renewable energy.
- Net Metering allows customers to export power to the grid during times of excess generation, and receive credits that can be applied to later electricity usage – daily, monthly, even annually.
- Grid-connected renewable energy system must have an interconnection agreement
  - Sets the terms and conditions under which a renewable energy system can be safely connected to the utility grid and outlines metering arrangements for the system
- Conventional net metering customer-sited renewable energy system connected to the utility grid through meter - "behind-the-meter generation."
  - Net metering uses a single, bi-directional meter - can measure current flowing either direction.
- Specifics of net metering are dependent on the customer's service classification.

Net Metering

- If the site is using MORE electricity than the system is producing, all the electricity produced used on-site and supplemented from the grid.
- If the site is using LESS electricity than the system is producing, the excess exported to the grid and customer receives a credit. This is typically recorded as negative use and is commonly referred to as the "meter spinning backwards."
- Generally credited to customer's next bill at retail rate
  - except avoided-cost rate for micro-CHP and fuel cells;
  - excess for residential PV and wind and farm-based biogas is reconciled annually at avoided-cost rate;
  - excess for micro-hydro, non-residential wind and solar, and residential micro-CHP and fuel cells carries over indefinitely

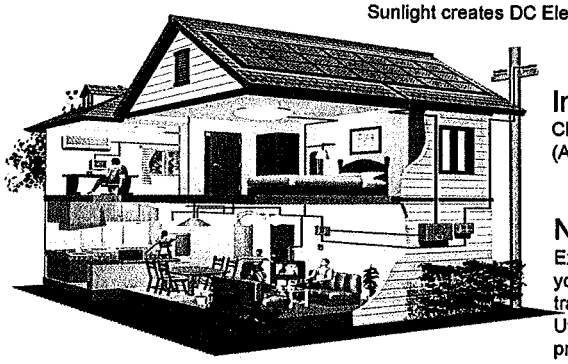
Net Metering

- "Remote" and/or "Community" Net Metering
  - Customers who are eligible may apply those credits to other accounts.
- NET METERING LIMITATIONS
  - Onsite generation systems typically limited to 110% of average annual usage for net metering.
  - Solar: 25 kW for residential; 100 kW for farms; 2 MW for non-residential
  - Wind: 25 kW for residential; 500 kW for farm-based; 2 MW for non-residential
  - Micro-hydroelectric: 25 kW for residential; 2 MW for non-residential
  - Fuel Cells: 10 kW for residential; 1.5 MW for non-residential
  - Biogas: 1 MW (farm-based only)
  - Micro-CHP: 10 kW (residential only)

Land Use Planning for Solar

Typical System Components

The Grid Tied Solar Electric System



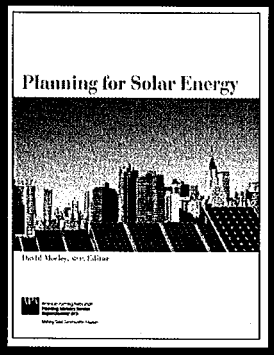
Solar Panels
Sunlight creates DC Electricity

Inverter
Changes DC Power to AC
(AC Power used in Home)

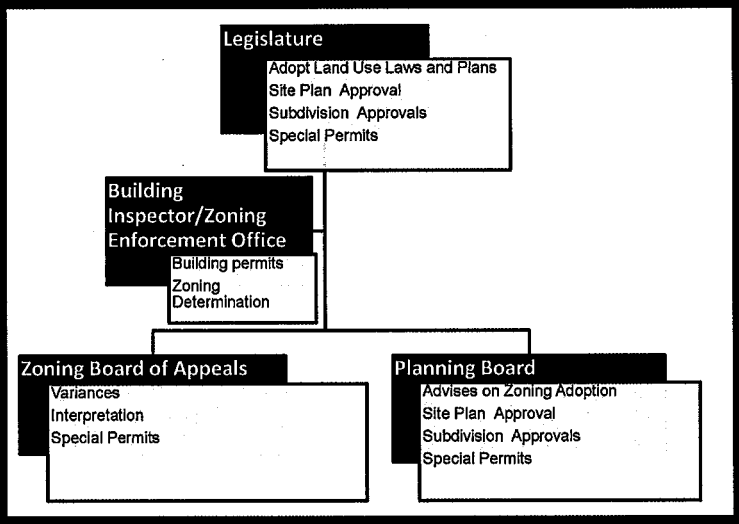
Net Metering
Excess (Unused) power turns your meter backward and travels back into the grid. Utility issues credits for power produced.

Land Use Planning for Solar Energy

- **Plan Making**
- **Policy Development**
- **Community Engagement**



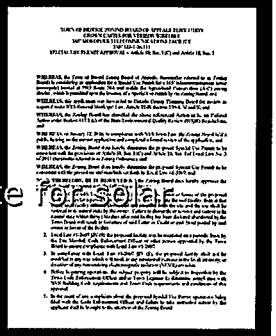
Delegation of Authority



Role of Local Gov't & Planning

1,550 + local jurisdictions in NY
With land use authority

Policy Development Framework



Adopt a Resolution that:

- Lists solar benefits and findings
- States intention to plan and regulate for solar
- Adopts a task force
- Authorized research and studies
- Establishes a training program
- Authorized an inter-municipal partnership
- Seeks state and federal funding and assistance
- Develop a community engagement process

What are the Benefits of Solar?

A. Economic development & job creation
B. Environ. & public health benefits
C. Reduced & stabilized energy costs
D. Energy independence & resilience
E. Value to utility
F. Community pride
G. Other

Example: Statement of Purpose

New York State Model Solar Zoning Ordinance

- Taking advantage of a safe, abundant, renewable, and non-polluting energy resource;
- Decreasing the cost of energy to the owners of commercial and residential properties, including single-family houses; and
- Increasing employment and business development in the region by furthering the installation of Solar Energy Systems.

Appoint a Task Force

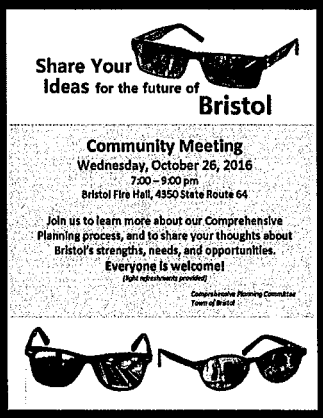
- Charge an existing sustainability task force or conservation advisory council
- Work with the Regional Planning Board or County
- Create a Solar/Renewable Energy Task Force
- Create an ad hoc committee of existing Town Board Members

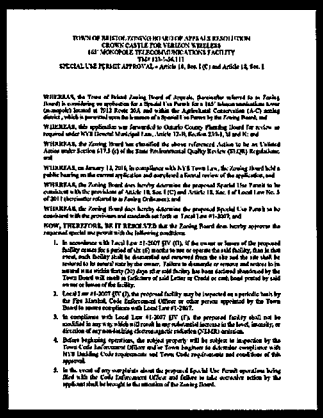
What is the Task Force's Role?

- Conduct studies & performing research
- Establishing a training program
- Partnering with adjacent communities
- Leveraging state and federal technical assistance grants
- Developing a community engagement process
- Amending the comprehensive plan
- Considering regulatory changes

Planning to Accommodate Solar

- Add Solar Energy Component to Comp Plan
- Adopt Solar Energy Policy or Plan





Comprehensive Plan

Comprehensive plans are the foundational policy document reflecting a community's priorities and values regarding development and local resources.

- Renewable energies are an increasingly valuable local resource
- Environmental and economic benefits through clean energy production
- Creation of local jobs and revenue
- Improved property values

Comprehensive Plan Considerations

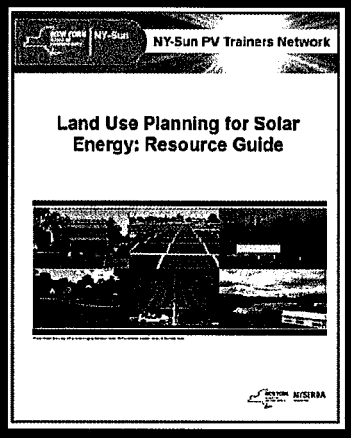
When addressing solar development in a comprehensive plan, it is important to acknowledge what makes solar work for a community as well as the inherent conflicts that may arise. Any comprehensive plan that includes a solar component should:

1. Address the solar resource and the different land use forms that solar development can take.
2. Acknowledge the multiple benefits of solar development.
3. Guide decision-makers on optimizing opportunities when solar development might conflict with other resources or land use forms.

Each of these components can help a community identify how they wish to include solar as a resource and to be able to reasonably justify why and where solar development is supported.

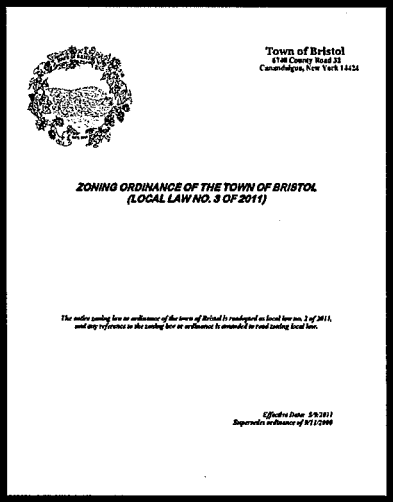
Resources

Land Use Planning for Solar Energy



https://training.ny-sun.ny.gov/images/PDFs/Land_Use_Planning_for_Solar_Energy.pdf

Zoning for Solar


Town of Bristol
6740 County Road 32
Canandaigua, New York 14424

ZONING ORDINANCE OF THE TOWN OF BRISTOL
(LOCAL LAW NO. 3 OF 2011)

Zoning for Solar Energy

Zoning Must be in Accordance with Comprehensive Plan

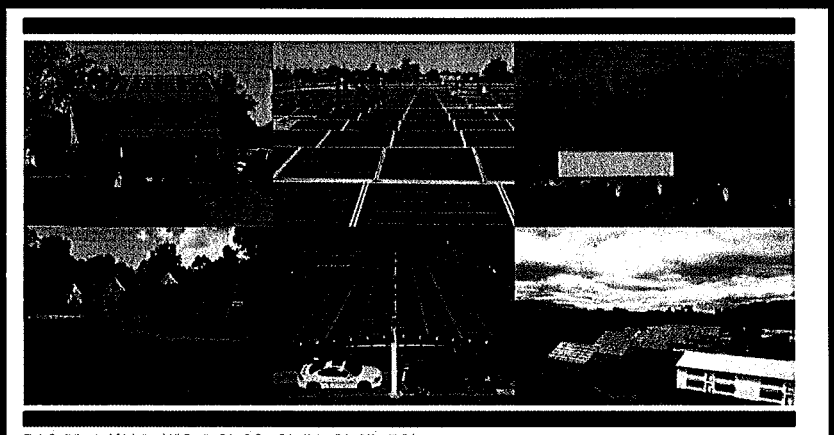


Photo Credit (from top left to bottom right): Sunation Solar, OnForce Solar, Hudson Solar, & Monolith Solar

New York Zoning Resources

Zoning for Solar Energy: Resource Guide

https://training.ny-sun.ny.gov/images/PDFs/Zoning_for_Solar_Energy_Resource_Guide.pdf

Zoning for Solar: Webinar

https://training.ny-sun.ny.gov/zoning-for-solar-webinar

New York Model Solar Zoning Law

http://www.cuny.edu/about/resources/sustainability/reports/NYS_Model_Solar_Energy_LawToolkit_FINAL_final.pdf

Example Zoning Chapter

- Purpose
- Definitions
- Establishment of Districts & Zoning Map
- District Use, Lot, and Bulk Regulations
- Special Permit Regulations
- Supplemental Regulations
- Off-Street Parking, Driveways and Loading Areas
- Nonconforming Uses, Buildings and Structures
- Site Plant and Special Permit Review & Approval

Example: Model Solar Zoning Law

Section 1: Authority
Section 2: Statement of Purpose
Section 3: Definitions
Section 4: Applicability
Section 5: Solar as an Accessory Use / Structure
Section 6: Approval Standards for Large-Scale Solar Systems as a Special Use
Section 7: Abandonment and Decommissioning
Section 8: Enforcement
Section 9: Severability

Defining Solar Energy Systems

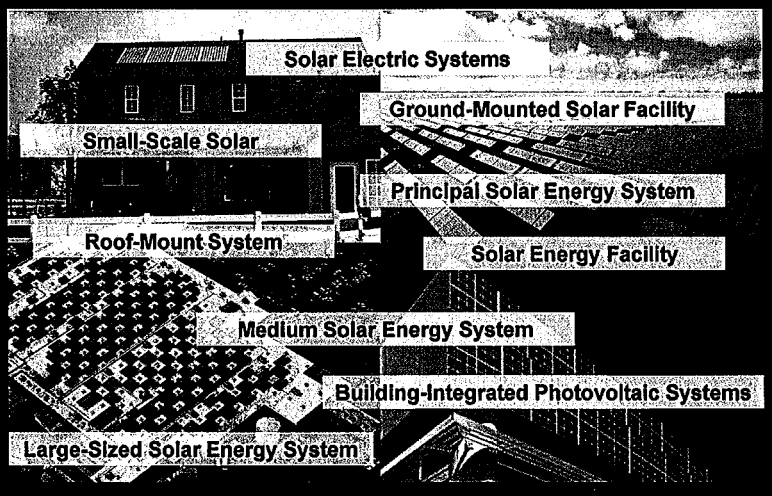
Zoning Definitions Section

§ 300-4 Definitions and word usage.

A. Word usage. Except where specifically defined herein, all words used in this chapter shall carry their customary meanings. Words used in the present tense include the future, and the plural the singular. The word "lot" includes the word "plot"; the word "building" includes the word "structure"; the word "shall" is intended to be mandatory; and "occupied" or "used" shall be considered as though followed by the words "or intended, arranged or designed to be used or occupied."

B. Definitions. As used in this chapter, the following terms shall have the meanings indicated:

Defining Solar Energy Systems

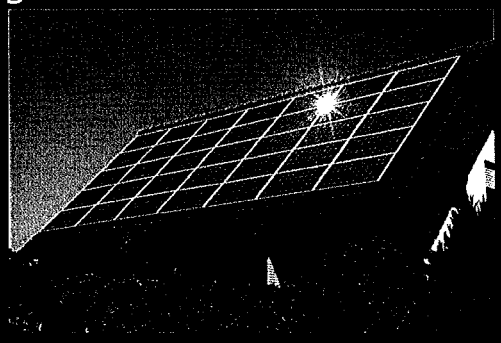


Defining Solar: Four Factors to Consider

- Energy System Type
- Location Where System-Produced Energy is Used
- Bulk & Area of System Dimension
- System Energy Capacity

Defining Solar: System Type

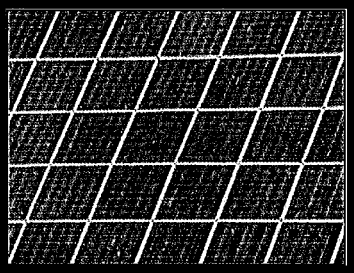
- Roof or Building-Mounted
- Ground-Mounted or Freestanding
- Building-Integrated



Defining Solar: Energy Usage

Energy is Used:

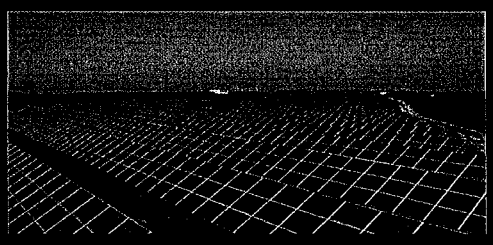
- Entirely Onsite with Some Net Metering
- Entirely Offsite
- Onsite & Offsite



Defining Solar: Bulk & Area

Define according to physical size of system:

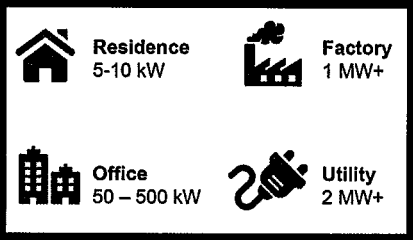
- Min. or Max. Footprint or Disturbance Zone
- Measure in:
  - acres, square feet, % of lot coverage, or % of primary structure's foot print

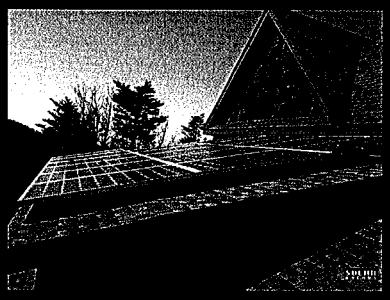


Defining Solar: Energy Capacity

Minimum or Maximum kW:

- Generating Capacity
- Rated Capacity
- Rated Storage Volume

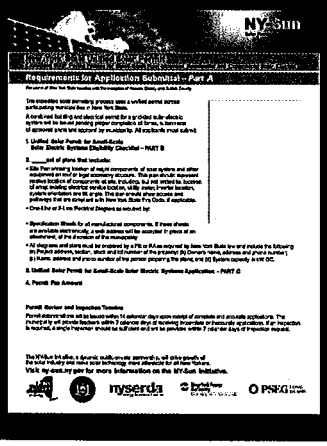




Example: System Type and Energy Capacity

For Small-Scale Solar Electric Systems (SES):

- Rated Capacity of 12 kW or less
- Roof-Mounted



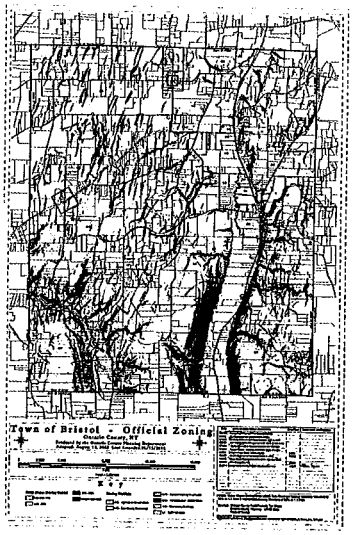
Example: System Type & Energy Use

New York State Model Solar Zoning Ordinance

- Building-Integrated Photovoltaic
- Roof-Mounted – on or off site use
- Ground-Mounted – primarily used on-site
- Large-Scale System → ground mounted & offsite energy consumption

Update Zoning Code

Siting: Determine which zoning districts to permit each defined system



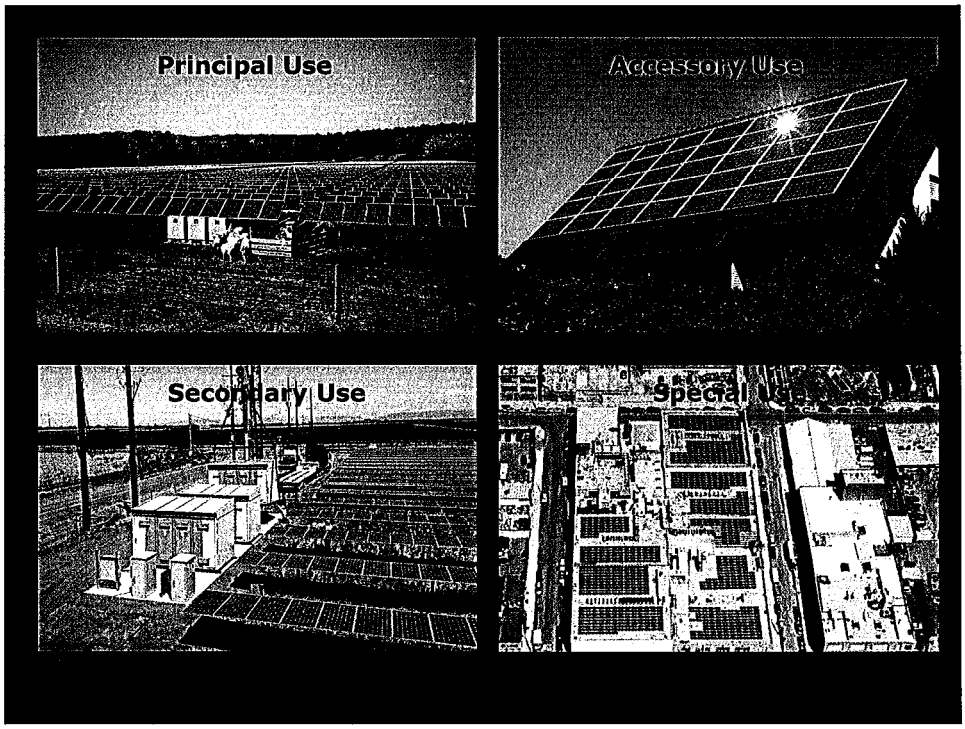
Example: Model Solar Zoning Law

- Roof-mounted systems are permitted as an accessory use in **all zoning districts** when attached to lawfully permitted principal and accessory structures, subject to requirements.
- Ground-mounted solar energy systems that use electricity on site are permitted as an accessory structure **in district**, subject to the requirements.
- Large-scale solar energy systems are permitted through the issuance of a special-use permit **within district** subject to requirements.

Amending District Use Regulations to Allow Solar

Land Uses Allowed in District As:

1. Principal Use
2. Accessory Use
3. Secondary Use
4. Special Use



Review and Approval Process

Project review and approval requirements generally intensify as impacts associated with permitted solar energy system increase.

Land Use Review Option

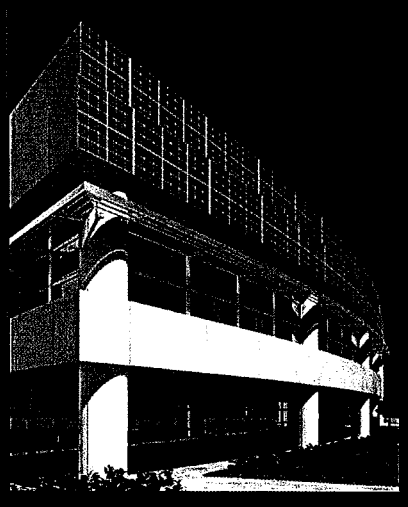
For Building-Integrated

- Building parts exempt from land use review
- Subject to building code compliance

Land Use Review Options

For Small-Scale, Accessory Systems:

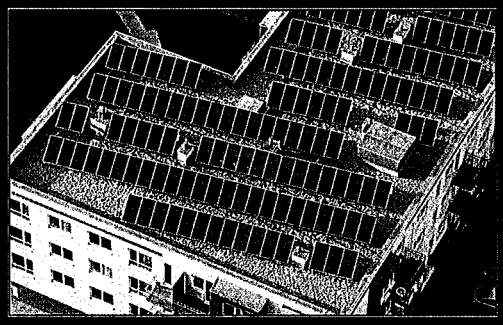
- Review by Enforcement Officer
- Must be 12 kW or less & roof-mounted
- Exempt from zoning review
- Expedited review for combined building and electrical permit



Land Use Review Options

For Larger Systems with Greater Impacts:

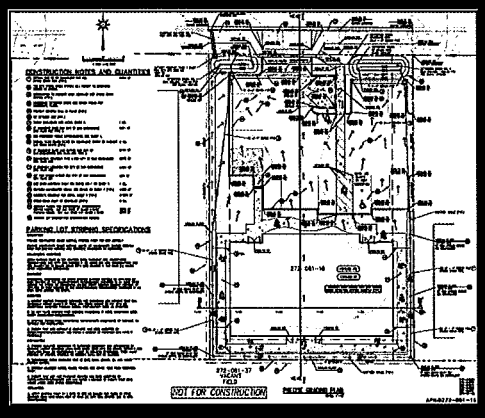
- Major & Minor Site Plan Review
- Special Use Permit Review



Amending Site Plan Review

Preliminary Site Plan Review

Final Site Plan Review



Example

Minor Site Plan Review for:

- Ground-Mounted
- Between 2,000 sq. ft. & 10 acres in size

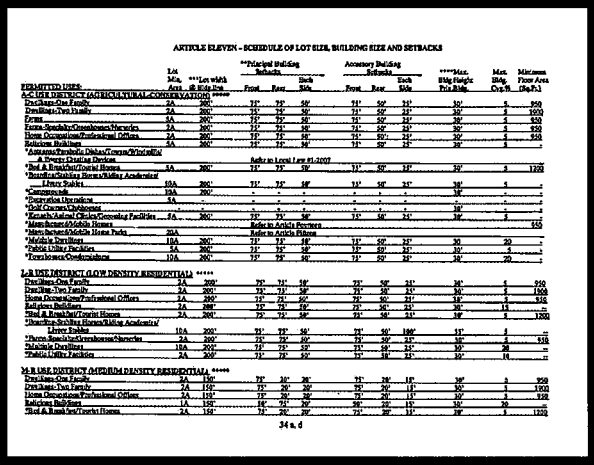
Preliminary & Final Site Plan Review for:

- > 10 acres in size
- Site plan must include: transmission line/equipment location, changes to existing substations, how facility will connect to grid, landscape maintenance plan, decommissioning plan, etc.

Example: Model Solar Zoning Law

- Roof-mounted systems are permitted as an **accessory use** in all zoning districts when attached to lawfully permitted principal and accessory structures, subject to the requirements.
- Ground-mounted solar energy systems are permitted as an **accessory structure** in [*Insert district(s)*], subject to the requirements.
- Large-scale solar energy systems are permitted through the issuance of a **special-use permit** within **[***Insert district(s)***]**subject to requirements.
  - **Site plan** approval is required. *WAIVERS* permitted.

Reviewing Bulk & Area Requirements



ARTICLE ELEVEN - SCHEDULE OF LOT SIZE, BUILDING SIZE AND SETBACKS

PERMITTED USES:	Lot Min. Area	***Lot width @ Bldg line	**Principal Building Setbacks Front	Rear	Each Side	Accessory Building Setbacks Front	Rear	Each Side	****Max. Bldg Height Prin Bldg	Max. Bldg. Cvg %	Minimum Floor Area /Sq.Ft.
AC-1SR DISTRICT (AGRICULTURAL-CONSERVATION) *****											
Dwellings-One Family	2A	200'	75'	75'	50'	75'	50'	25'	30'	5	950
Dwellings-Two Family	2A	200'	75'	75'	50'	75'	50'	25'	30'	5	1000
Farms	5A	300'	75'	75'	50'	75'	50'	25'	30'	5	950
Farms-Specialty/Greenhouses/Nurseries	2A	200'	75'	75'	50'	75'	50'	25'	30'	5	950
Home Occupations/Professional Offices	2A	200'	75'	75'	50'	75'	50'	25'	30'	5	950
Religious Buildings	3A	300'	75'	75'	50'	75'	50'	25'	30'	5	-
*Antenna/Symbolic Dishes/Towers/Windmills/ & Power Generating Devices			Refer to Local Law #1-2007								
*Bed & Breakfast/Tourist Homes	5A	200'	75'	75'	50'	75'	50'	25'	30'	5	1200
*Boarding/Sibling Homes/Riding Academies/ Livery Stables	10A	200'	75'	75'	50'	75'	50'	25'	30'	5	-
*Campgrounds	10A	200'	-	-	-	-	-	-	30'	-	-
*Cemeteries	3A	-	-	-	-	-	-	-	-	-	-
*Golf Courses/Clubhouses	-	-	-	-	-	-	-	-	30'	-	-
*Kennels/Animal Clinics/Grooming Facilities	5A	200'	75'	75'	50'	75'	50'	25'	30'	5	-
*Manufactured/Mobile Homes			Refer to Article Fourteen								550
*Mini Storage/Mobile Home Parks	20A		Refer to Article Fifteen								
*Mobile Dwellings	10A	200'	75'	75'	50'	75'	50'	25'	30	20	-
*Public Utility Facilities	5A	200'	75'	75'	50'	75'	50'	25'	30'	5	-
*Townhouses/Condominiums	10A	200'	75'	75'	50'	75'	50'	25'	30'	20	-
L-R USE DISTRICT (LOW DENSITY RESIDENTIAL) *****											
Dwellings-One Family	2A	200'	75'	75'	50'	75'	50'	25'	30'	5	950
Dwelling-Two Family	2A	200'	75'	75'	50'	75'	50'	25'	30'	5	1000
Home Occupations/Professional Offices	2A	200'	75'	75'	50'	75'	50'	25'	30'	5	950
Religious Buildings	3A	300'	75'	75'	50'	75'	50'	25'	30'	15	-
*Bed & Breakfast/Tourist Homes	2A	200'	75'	75'	50'	75'	50'	25'	30'	5	1200
*Boarding/Sibling Homes/Riding Academies/ Livery Stables	10A	200'	75'	75'	50'	75'	50'	100'	35'	5	-
*Farms-Specialty/Greenhouses/Nurseries	2A	200'	75'	75'	50'	75'	50'	25'	30'	5	650
*Mobile Dwellings	10A	200'	75'	75'	50'	75'	50'	25'	30'	20	-
*Public Utility Facilities	5A	200'	75'	75'	50'	75'	50'	25'	30'	15	-
M-R USE DISTRICT (MEDIUM DENSITY RESIDENTIAL) *****											
Dwellings-One Family	2A	150'	75'	30'	20'	75'	20'	15'	30'	5	950
Dwelling-Two Family	2A	150'	75'	30'	20'	75'	20'	15'	30'	5	1000
Home Occupations/Professional Offices	2A	150'	75'	30'	20'	75'	20'	15'	30'	5	950
Religious Buildings	1A	150'	50'	75'	30'	50'	20'	15'	30'	30	-
*Bed & Breakfast/Tourist Homes	2A	150'	75'	30'	20'	75'	20'	15'	30'	5	1200

34 a, d

Example: Model Solar Zoning Law

Roof-mounted systems:

- Height and setback requirements from underlying zoning
  - Height exemptions granted to building-mounted mechanical devices or equipment apply

Ground-mounted systems:

- Size: Systems are limited to [Insert Lot Coverage Percentage].
- Setback & Height: Requirements of the zoning district
- Location: Installed in rear or side yards (residential districts only)

Example: Model Solar Zoning Law

Large-scale solar energy systems:

- Height and Setback:
  - requirements of the underlying zoning district.
  - Additional restrictions may be imposed during the special-use permit process.
- Minimum lot size of [*Insert Size Requirement*]square feet.
- Size: Systems are limited to [*Insert lot coverage percentage*]
  - Panel surface area shall be included in total lot coverage

Development Standards

Some municipalities impose specific development standards to mitigate land use impacts associated with solar energy system

Development Standards for Accessory SES's

Roof Mounted:

- Max height
- Min tilt, angle
- Color & location restrictions

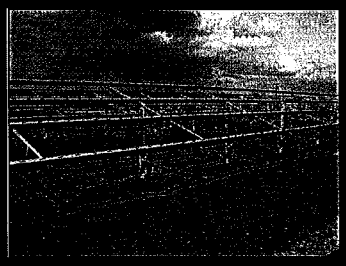
Ground Mounted:

- Setback, yard requirements
- Max height
- Blending or screening

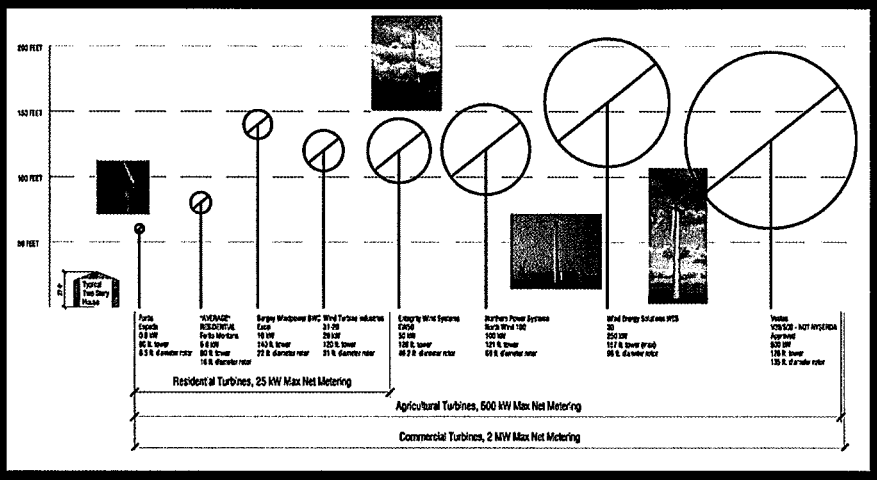
Development Standards for Principal-Use SES's

Requirements to Mitigate Impacts:

- Siting
- Height Limits
- Setbacks
- Screening
- Safety (fencing, signage)
- Utility Interconnection
- Required Studies (environmental, economic)
- Decommissioning/Site Restoration



Wind Energy Regulation

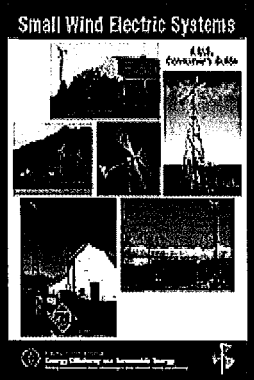


Resources

- NYSERDA Wind Toolkit

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

  - Model Ordinance
    www.powernaturally.org/Programs/Wind/toolkit/2_windenergymodel.pdf
  - Small Wind Ordinance
    www.powernaturally.org/publications/AWS_Small_Wind_Zoning.pdf
  - Local Law Examples
    www.powernaturally.org/Programs/Wind/toolkit/3_revised.pdf
- PA Model Ordinance
  - *www.depweb.state.pa.us/energy/lib/energy/docs/wind_model_ordinance_draft_(12-8-06).doc*
- Many Local Laws available via internet
- American Wind Energy Association - http://www.awea.org/la_smallwind.cfm
  - *In the Public Interest - How and Why to Permit for Small Wind Systems; A Guide for State and Local Governments*
- US Department of Energy - http://www1.eere.energy.gov/windandhydro/
  - *(wind ordinance webinar today)*

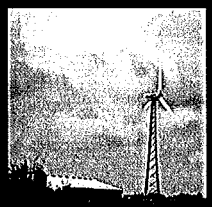


Typical Private Wind Turbines

Windspire –
Vertical Axis Turbine

Jay Leno's VAWT

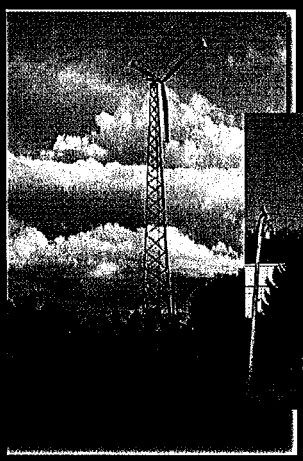
Skystream, Baldwinsville NY



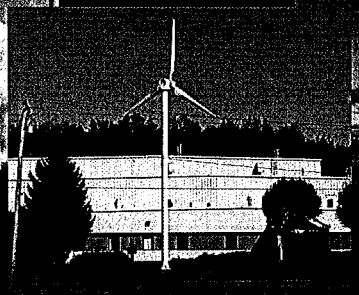
WindTamer, Perry NY

Agricultural Wind Turbine

Typical Private Wind Turbines



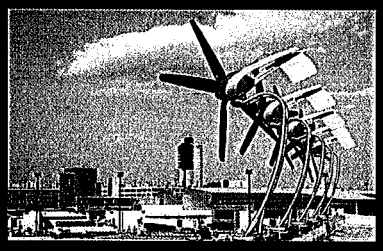
Entegrity, EW50
50kW (145 ft.)



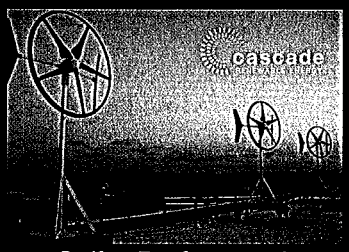
Paul De Lima Coffee:
I-81 North of Syracuse
10 kw (~65 ft.)

Harbec Plastics
Ontario NY
250 kW Fuhrlander FL250,
213 feet total height

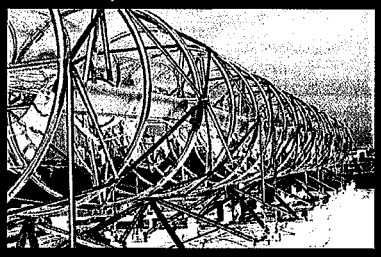
Typical Private Wind Turbines



AeroVironment, AVX1000, 1 kW.



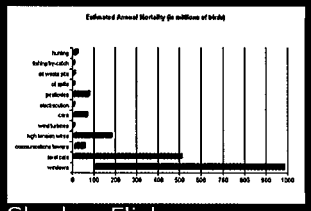
Swift – Roof mounted



Aeroturbines by Aerotecture International Inc.

Wind Energy Potential Impacts
(Reasons to Regulate)

- Visual impact
- Sound
- Avian/Bat & Wildlife/Habitat



- Shadow Flicker
- Falling, Ice Throw & Blade Failure
- EMF Interference
- EMF Exposure
- Stray Voltage, Grounding
- Roads & Bridges, Transportation, Access
- Wetlands, Stormwater & Groundwater
- Agriculture
- Historic & Cultural Resources
- Aviation & FAA regulations
- Property Values
- Insurability
- Community Character
- Community Growth
- Jobs/Tourism
- Tax Revenue (PILOT)
- Public Services & Emergency Services
- Decommissioning/Removal
- Complaint resolution

Regulations Should:

- Define permitting requirements
- Indicate permissible zones
- Provide technical standards
- Indicate application requirements
- Clearly define all items
- Use consistent terms and definitions
- Specify the level of detail you need to review the application
- Be revisited and revised as more information and experience becomes available, and technology changes.

Key Considerations

- Power output vs. rotor diameter & height
- Potential Users
  - (Resid., Institutional/Educational, Commercial/Industrial)
- Zoning
  - (Residential, Agricultural, Industrial, Overlay)
- Setback requirements
- Roof-mounted, Horizontal, Vertical Axis
- Wind Measurement (MET) Towers

Definitions

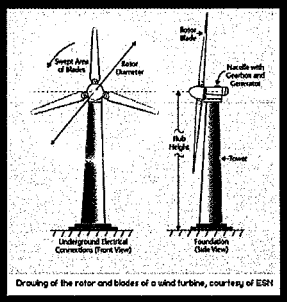
- Define private wind energy
  - PRIVATE WIND ENERGY CONVERSION SYSTEM ("Private WECS"): A wind energy conversion system (WECS) consisting of one or more wind turbines with associated towers, buildings, equipment, and control or conversion electronics, whose power output is
- Differentiate from Utility Scale
  - UTILITY SCALE WIND ENERGY CONVERSION SYSTEM ("Utility Scale WECS"): Wind energy conversion systems consisting of wind turbines, towers, and all related infrastructure including electrical lines and substations, access roads, and accessory structures
- Define Residence
  - RESIDENCE: Any dwelling suitable for habitation existing on the date that a specific application is deemed complete, including seasonal homes, but not including hotels, hospitals, motels, dormitories, sanitariums, nursing homes, senior housing, schools, correctional institutions or other buildings used for educational purposes. A residence may be part of a multi-dwelling building.
- RESIDENTIAL WECS: Private WECS whose power output serves a residence as defined above.
- Define the Non-Residential WECS (Commercial, industrial, institutional).

Definitions

- AMBIENT NOISE LEVEL:
  - The noise level which is exceeded 90 percent of the time (expressed as L90) or 54 minutes of every hour. (Quietest 10% of hour)
- WECS OPERATIONAL SOUND PRESSURE LEVEL:
  - The level which is equaled or exceeded a stated percentage of time.
    - An L10 – "X" dBA indicates that in any hour of the day "X" dBA can be equaled or exceeded only 10% of the time, or for six minutes. (Loudest 10% of hour)
    - The measurement of the sound pressure level shall be done according to the International Standard for Acoustic Noise Measurement Techniques for Wind Generators (IEC 61400-11), or other accepted procedures.
    - WECS operational sound pressure level restrictions shall mean the cumulative existing ambient sound pressure level (as defined herein) the sound generated by the WECS.
- DEFINE APPLICANT "SITE". Important for setbacks.
  - Ex: The parcel(s) of land where the Wind Energy Conversion Facility is to be placed. The Site may be publically or privately owned by an individual or a group of individuals controlling single or adjacent properties. Where there are multiple applicants, their joint lots shall be treated as one lot for purposes of applying the requirements of this law. Any property which has a Wind Energy Conversion Facility or has entered an agreement for said Facility or a setback agreement shall not be considered off-site.

Definitions

- Height
  - Typically tower height and blade at the highest vertical extension (rotation).
  - Consider ground level.



Drawing of the rotor and blades of a wind turbine, courtesy of ESN

- Private WECS as accessory uses
  - By definition, private WECS intended to power existing onsite uses, and therefore may be considered accessory uses.

General Provisions

- Special Use Permits
  - Discretionary. Provides for review of difficult-to-quantify aspects such as visual impact.
- Define zones where WECS (or Types of WECS) are permitted.
- Define prohibitions
  - Height, rotor diameter, power output? Utility Scale?
  - FAA lighting prohibited? Restricts to less than 200 ft.
  - Homemade WECS? Roof mounted?
- SUP or SUP and Site Plan Approval?
  - Residential maybe just SUP.
  - Non-residential SUP and Site Plan.

SUP Application

- SUP application requirements:
  - Applicant and "site" information, description of project
  - Adjacent property owners?
  - Manufacturer's information
    - Make, model, photos, specs, noise output
  - Information demonstrating system sized, and will be used, to reduce onsite consumption of utility provided power.
  - Demonstrate tower meets structural design requirements for seismic, wind, ice. NY PE certified?
  - Consider report/letter from NY PE or manufacturer regarding potential distance and damage from ice or blade throw.
  - Provide information that turbine will not interfere with telecommunications.

SUP Application
- Shadow Flicker -

- Usually not a concern on small turbines.
- Require study of potential impact where receptors within 10 rotor diameters?
  - Ex: Where an occupied structure (receptor) is located within 10 rotor diameters of a WECS, the applicant shall include in the application an analysis and report on potential shadow flicker by a Professional Engineer licensed in the State of New York. The report shall identify receptors where shadow flicker may be caused by the WECSs, and the expected times and durations of the flicker at these receptors. The report shall describe measures that shall be taken to eliminate or mitigate the problems, including reduction of WECS operations during shadow flicker periods.

SUP Application
- Noise -

- Consider study if operational noise levels may exceed 35 dBA at the property line.
  - EX: Unless manufacturer data is provided that demonstrates sound levels produced by the WECS are anticipated not to exceed 35 dBA at the property line of the Site, the applicant shall provide with the application a noise analysis and report by a professional engineer licensed in the State of New York documenting the potential noise levels associated with the proposed WECS. The report shall document noise levels at the Site property lines, and occupied structures (receptors) not on the Site within 1500 feet of the turbine. The noise analysis shall provide pre-existing ambient noise levels, combined ambient and turbine sound levels, and include low frequency noise.
- Provide for testing in response to complaints.

SUP Application
- Visual Impact -

- Provide option for waiver
- Describe documentation required
  - Color photographs with scaled turbine(s). (software).
  - Minimum number of vantage points or strategic vantage points (adjacent parcels, with permission of owners).
- Lighten requirements for residents
  - Perhaps allow balloon study.

SUP Application
- Decommissioning -

- Decommissioning Plan
  - Anticipated life of turbine
  - Estimated cost of decommissioning/removal
  - Manner in which will be removed, site restoration.
- Decommissioning bond, letter of credit or escrow?
  - If cost expected to exceed certain amount? ($250,000?)
  - For projects below threshold, removal at Owner's expense or if Town removes becomes lien?
- Decommissioning costs should not be offset by salvage value!

Technical Standards

Establish minimum standards for all WECS and METs

- Lighting (site), FAA lighting?
- Number of Roof mounted turbines?
- Height restriction on roof mounted turbines.
- Tower type – tubular, lattice, guyed.
- Paint: unobtrusive color, matte/non-reflective.
- Underground all wiring?
- No advertising or television/radio/telecom antennas?
- Homemade or experimental permitted?
- Anti-climbing devices.
- Equip with manual or automatic over-speed controls.
- Locate to minimize environmental impacts; flood plains, wetlands, rare species habitat, etc...
- Maintenance requirements (keep in good operating condition).

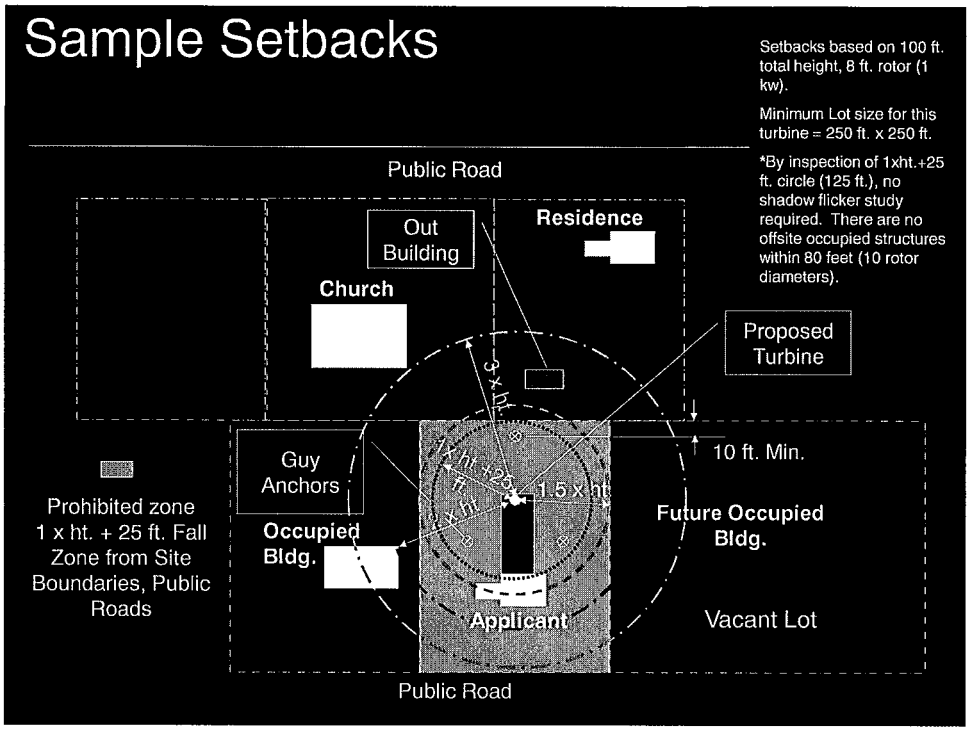
Setbacks

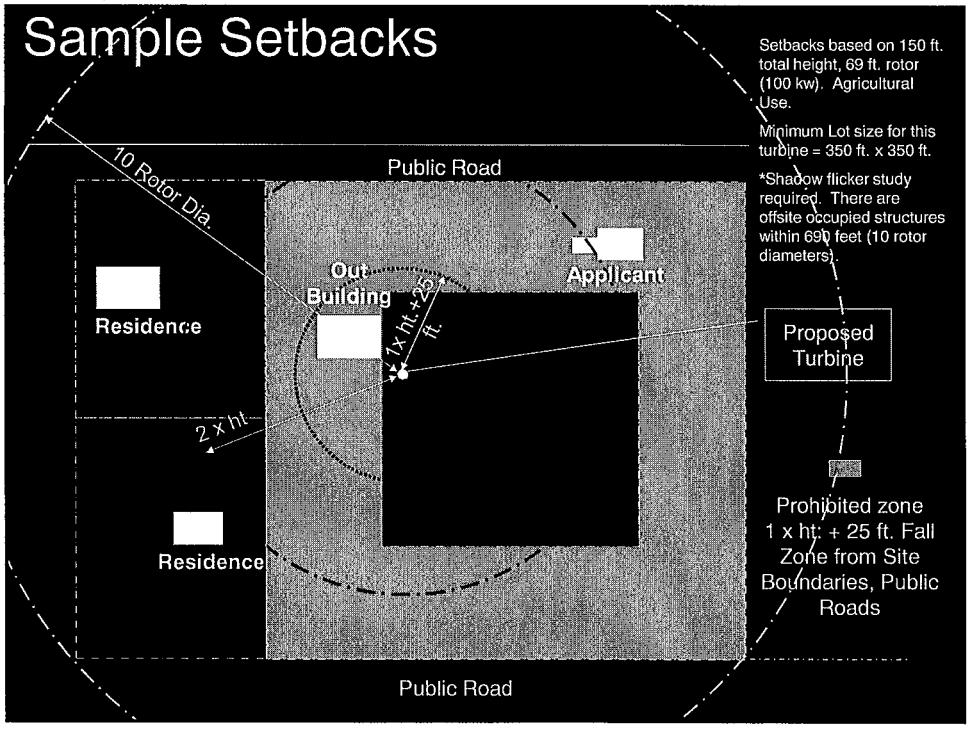
Met Towers and WECS

- Wetland (100 ft. from state-identified)
- Public roads (more than 1x, 1.1x to 2x)
- Site boundary (property line) (1x to 2x, 1.5x)
- Nearest off-site occupied building? (2x)
- Property line of vacant parcel (to allow development, 1.5x)
- Schools, place of worship, hospital, other high occupancy receptors (3x?)
- Guy anchor setbacks from site boundary (10 to 25 feet)
- Shadow flicker exposure (25 hours max, annual)
- Noise (Shall not result in increase of more than 6 dBA over pre-existing ambient).
  - "Perception based standard".
  - 6 dBA is where complaints usually begin.
  - I prefer over set value, as applicable in low and high ambient sound areas.
  - Consider at property/site line, or at residence. Property line covers all including vacant or portions of parcels that may be developed in the future.
  - If steady pure tone (screech or hum) reduce all noise restrictions by 5 dBA.

General Administrative

- Fees
- Variances
- Severability
- Permit Revocation
- Abatement process
  - Include provision to allow Town to verify if WECS is operating or not, and remove turbine.
    - WECS or Met Towers which are not used for 6 successive months shall be deemed abandoned and shall be dismantled and removed from the property at the expense of the property owner. Removal and site restoration shall be completed within six (6) months of a determination of inoperability.
    - Failure to abide by and faithfully comply with this law or with any and all conditions that may be attached to the granting of any building permit shall be a violation of this law and constitute grounds for the revocation of the permit by the Town and use of any decommissioning bond or fund to remove the WECS or Met Tower.
    - The applicant shall make available to the Town Planning Board all reports to and from these entities, if requested, necessary to prove the WECS is functioning, which reports may be redacted or subject to a reasonable non-disclosure agreement as necessary to protect proprietary information.


Sample Setbacks
Setbacks based on 100 ft. total height, 8 ft. rotor (1 kw).
Minimum Lot size for this turbine = 250 ft. x 250 ft.
*By inspection of 1xht.+25 ft. circle (125 ft.), no shadow flicker study required. There are no offsite occupied structures within 80 feet (10 rotor diameters).
Public Road
Out Building
Residence
Church
Proposed Turbine
3 x ht.
1 x ht. + 25 ft.
1.5 x ht.
10 ft. Min.
Guy Anchors
Prohibited zone 1 x ht. + 25 ft. Fall Zone from Site Boundaries, Public Roads
Occupied Bldg.
Future Occupied Bldg.
Applicant
Vacant Lot
Public Road


Sample Setbacks
Setbacks based on 150 ft. total height, 69 ft. rotor (100 kw). Agricultural Use.
Minimum Lot size for this turbine = 350 ft. x 350 ft.
*Shadow flicker study required. There are offsite occupied structures within 690 feet (10 rotor diameters).
10 Rotor Dia.
Public Road
Applicant
Out Building
1 x ht. + 25 ft.
Residence
Proposed Turbine
2 x ht.
Prohibited zone 1 x ht. + 25 ft. Fall Zone from Site Boundaries, Public Roads
Residence
Public Road

Questions?

Thank you for your Participation!

MRB | group

ENGINEERING • ARCHITECTURE • GIS • PLANNING
MAPPING • CONSTRUCTION • MANAGEMENT