CRITERION 1 is met by a municipality passing zoning in designated locations for the **as-of-right siting of renewable or alternative energy generating facilities**, research and development facilities, or manufacturing facilities.

CRITERION 2: EXPEDITED PERMITTING A municipality must adopt an expedited application and permitting process under which Criterion 1 facilities may be sited within the municipality, and the permitting process shall not exceed one (1) year from the date of initial application to the date of final approval. The expedited application and permitting process applies only to proposed facilities that are subject to the Criterion 1 as-of-right siting provision. An applicant can meet this requirement by applying the expedited permitting process of MGL c 43D to these zoning districts.

CRITERION 3: ENERGY BASELINE / 20 PERCENT ENERGY REDUCTION PLAN A municipality must establish an energy use baseline inventory for all municipal buildings (which includes school buildings, drinking water and wastewater treatment plants, pumping stations and open spaces), vehicles, and street and traffic lighting. A municipality must also adopt a comprehensive five-year Energy Reduction Plan (ERP) designed to reduce that baseline by 20 percent after completion of a full five-years of implementing its ERP.

[Having already pursued every recommended energy conservation method available to us via the cape Light Compact, meeting this reduction will be difficult. Simply stated, the low hanging fruit has been picked.]

CRITERION 4: PURCHASE ONLY FUEL-EFFICIENT VEHICLES All Departments in the municipality must purchase only fuel-efficient vehicles for municipal use whenever such vehicles are commercially available and practicable.

[Police cars, fire engines and larger ambulances are exempt.]

CRITERION 5: MINIMIZE LIFE-CYCLE COSTS A municipality must require all new residential construction over 3,000 square feet and all new commercial and industrial real estate construction to minimize, to the extent feasible, the life cycle cost of facilities/buildings by utilizing energy efficiency, water conservation and other renewable or alternative energy technologies.

The recommended way for cities and towns to meet this requirement is by adopting the Board of Building Regulations and Standards (BBRS) Stretch Code (780 CMR 115.AA), an appendix to the MA State Building Code. Note: There is no minimum 3,000 square foot threshold for new residential construction if your municipality adopts the Stretch Code. All new residential construction, irrespective of size/square footage, will be subject to the Stretch Code.

Towns are advised to adopt the Stretch Code as a general bylaw at Town Meeting.

Should a community chose to not adopt the Stretch Code and choose to use another standard, the community must provide evidence that this alternative standard minimizes the life cycle energy costs for new construction and is enforceable by the community.

Model As-of-Right Zoning Bylaw: Allowing Use of Large-Scale Ground-Mounted Solar Photovoltaic Installations

Prepared by: Department of Energy Resources, Massachusetts Executive Office of Environmental Affairs December 2014

1.0 Purpose

The purpose of this bylaw is to promote the creation of new large-scale ground-mounted solar photovoltaic installations by providing standards for the placement, design, construction, operation, monitoring, modification and removal of such installations that address public safety, minimize impacts on scenic, natural and historic resources and to provide adequate financial assurance for the eventual decommissioning of such installations. The provisions set forth in this section shall apply to the construction, operation, and/or repair of large-scale ground-mounted solar photovoltaic installations.

1.1 Applicability

This section applies to large-scale ground-mounted solar photovoltaic installations proposed to be constructed after the effective date of this section. This section also pertains to physical modifications that materially alter the type, configuration, or size of these installations or related equipment.

Qualifying as a Green Community: *In order to satisfy the Green Communities Act as-of right zoning requirement a community's zoning must allow solar photovoltaic installations that utilize ground-mounted systems which individually have a rated name plate capacity of 250 kW (DC) or more.*

Approximate size of installation: *A solar photovoltaic array with a rated name plate capacity of 250 kW (DC) occupies approximately one acre of land.*

Smaller installations (under 250 kW): *The above requirement for qualification as a Green Community is not intended to discourage construction of solar photovoltaic installations that are smaller than 250 kW, but rather to ensure that in designated locations local regulatory barriers that may adversely affect large-scale ground-mounted projects are minimized.*

This Model Bylaw was prepared to assist cities and towns in establishing reasonable standards to facilitate development of large-scale ground-mounted solar photovoltaic installations. The bylaw was developed as a model and is not intended for adoption without specific review by municipal counsel.

2.0 Definitions

As-of-Right Siting: As-of-Right Siting shall mean that development may proceed without the need for a special permit, variance, amendment, waiver, or other discretionary approval. As-of right development may be subject to site plan review to determine conformance with local zoning ordinances or bylaws. Projects cannot be prohibited, but can be reasonably regulated by the inspector of buildings, building commissioner or local inspector, or if there is none in a town, the board of selectmen, or person or board designated by local ordinance or bylaw.

Building Inspector: The inspector of buildings, building commissioner, or local inspector, or person or board designated by local ordinance or bylaw charged with the enforcement of the zoning ordinance.

Building Permit: A construction permit issued by an authorized building inspector; the building permit evidences that the project is consistent with the state and federal building codes as well as local zoning bylaws, including those governing ground- mounted large-scale solar photovoltaic installations.

Designated Location: The location[s] designated by [the community's local legislative body], in accordance with Massachusetts General Laws Chapter 40A, section 5, where ground – mounted large scale solar photovoltaic installations may be sited as-of right. Said location[s] [is/are] shown on a Zoning Map [insert title of map] pursuant to Massachusetts General Laws Chapter 40A Section 4. This map is hereby made a part of this Zoning Bylaw and is on file in the Office of the [Town/City] Clerk.

Educational Note: *Existing Massachusetts law largely exempts solar photovoltaic installations from local zoning restrictions. Massachusetts General Laws Chapter 40A, Section 3, provides, in relevant part, that:*

No zoning ordinance or by-law shall prohibit or unreasonably regulate the installation of solar energy systems or the building of structures that facilitate the collection of solar energy, except where necessary to protect the public health, safety or welfare.

In view of M.G.L. ch. 40A § 3, local zoning provisions specifically allowing for the as-of-right construction of smaller solar energy systems – such as those commonly installed on top of or on the lot of a home or business—are unnecessary. However, it is not clear whether M.G.L.

ch. 40A § 3 applies to the construction of large scale ground-mounted systems. Therefore, to qualify as a green community, a municipality may adopt a solar photovoltaic bylaw for as-of right siting of large scale ground-mounted systems in a designated location(s). An existing example of a large scale ground-mounted solar photovoltaic system is the Brockton Brightfields Project.

Large-Scale Ground-Mounted Solar Photovoltaic Installation: A solar photovoltaic system that is structurally mounted on the ground and is not roof-mounted, and has a minimum nameplate capacity of 250 kW DC.

On-Site Solar Photovoltaic Installation: A solar photovoltaic installation that is constructed at a location where other uses of the underlying property occur.

Rated Nameplate Capacity: The maximum rated output of electric power production of the Photovoltaic system in Direct Current (DC).

Site Plan Review: review by the Site Plan Review Authority to determine conformance with local zoning ordinances or bylaws.

Note: *The term "designated location" refers to the location within a community where solar photovoltaic installations are permitted as-of-right. Establishment of a designated location for such installations is an integral part of the process of adopting an as-of-right solar photovoltaic bylaw.*

Legal Requirements: *The process of designating the location must comport with the requirements of Massachusetts General Laws Chapter 40A, Section 5, which sets out the requirements for adopting and amending zoning bylaws.*

Methods of Designating a Location: *Communities may designate locations by reference to geographically specific districts. In the alternative, communities may create an overlay district consisting of all or portions of multiple preexisting zoning districts, where large scale solar photovoltaic power generation is permitted by right. Because solar photovoltaic power generation produces neither adverse noise impacts nor harmful emissions, use of land for the purpose of solar photovoltaic power generation should be compatible with most other types of land usage. However DOER strongly discourages designating locations that require significant tree cutting, because of the important water management, cooling and climate benefits trees have. DOER encourages designating locations in industrial and commercial districts, or on vacant, disturbed land.*

Green Communities Program Requirements: *To qualify for designation as a Green Community, the designated location must provide a realistic and practical opportunity for development of a large scale solar photovoltaic power generation facility. In designating a location, it is important for the community implementing the as-of right zoning bylaw to consider the availability of sunlight and particular characteristics of the local community. It is not practical to site solar photovoltaic installations in areas that are surrounded by tall structures. The size of available lots is also a relevant consideration, though aggregation of contiguous parcels within a designated district in order to create a parcel of sufficient size to construct a qualifying facility will be considered. As previously mentioned, a solar photovoltaic array with a rated name plate capacity of 250 kW occupies approximately one acre of land.*

Site Plan Review Authority: For purposes of this bylaw, Site Plan Review Authority refers to the body of local government designated as such by the municipality

Solar Photovoltaic Array: an arrangement of solar photovoltaic panels.

Zoning Enforcement Authority: The person or board charged with enforcing the zoning ordinances or bylaws.

3.0 General Requirements for all Large Scale Solar Power Generation Installations

The following requirements are common to all solar photovoltaic installations to be sited in designated locations.

Note: *By state statute, the Zoning Enforcement Authority may be the "inspector of buildings, building commissioner or local inspector, or if there are none, in a town, the board of selectmen, or person or board designated by local ordinance or by-law". M.G.L. ch. 40A § 7. In many communities, the building inspector is the person charged with enforcing both the state's building code and local zoning ordinances or bylaws.*

Note: *The Site Plan Review Authority can be the Board of Selectman, City Council, Board of Appeals, Planning Board or Zoning Administrator. However, the Planning Board is typically the best group to serve in this capacity as it is usually the most familiar with the municipality's zoning bylaws/ordinances as well as its Master Plan or other plans for future conservation/development.*

Note: *In some communities this is known as Site Plan Approval rather than Site Plan Review. Regardless of which term is used by a community, the following excerpt from Lowe's Home Centers, Inc. v. Town of Auburn Planning Board provides an excellent judicial explanation of the nature of site plan review as applied to as-of-right uses: Site plan approval acts as a method for regulating as-of-right uses rather than prohibiting them as per Y.D. Dugout, Inc. v. Bd. Of Appeals of Canton, 357 Mass. 25, 31, 255 N.E.2d 732 (1970). When evaluating the Site Plan Applications, the Planning Board may not unconditionally deny the Site Plan Applications, but rather, it may impose reasonable conditions upon them. See Prudential, 23 Mass.App.Ct. at 281-82, 502 N.E.2d 137; Quincy, 39 Mass.App.Ct. at 21-22, 652 N.E.2d 901 ("[W]here the proposed use is one permitted by right the planning board may only apply substantive criteria ... i.e., it may impose reasonable terms and conditions on the proposed use, but it does not have the discretionary power to deny the use."). Thus, when a site plan application is submitted for an as-of-right use, a planning board is obligated to grant an approval with reasonable conditions unless, "despite best efforts, no form of reasonable conditions [can] be devised to satisfy the problem with the plan...." Prudential, 23 Mass.App.Ct. at 283n. 9, 502 N.E.2d 137; Castle Hill Apartments Ltd.P'ship v. Planning Bd. Of Holyoke, 65 Mass.App.Ct. 840, 845-45, 844 N.E.2d 1098 (2006).*

3.1 Compliance with Laws, Ordinances and Regulations

The construction and operation of all large scale solar photovoltaic installations shall be consistent with all applicable local, state and federal requirements, including but not limited to all applicable safety, construction, electrical, and communications requirements. All buildings and fixtures forming part of a solar photovoltaic installation shall be constructed in accordance with the State Building Code.

3.2 Building Permit and Building Inspection

No large scale solar photovoltaic installation shall be constructed, installed or modified as provided in this section without first obtaining a building permit.

3.3 Fees

The application for a building permit for a large scale solar photovoltaic installation must be accompanied by the fee required for a building permit.

3.4 Site Plan Review

Ground-mounted large scale solar photovoltaic installations with 250 kW or larger of rated nameplate capacity shall undergo site plan review by the Site Plan Review Authority prior to construction, installation or modification as provided in this section.

3.4.1 General

All plans and maps shall be prepared, stamped and signed by a Professional Engineer licensed to practice in Massachusetts.

3.4.2 Required Documents

Pursuant to the site plan review process, the project proponent shall provide the following documents:

(a) A site plan showing:

i. Property lines and physical features, including roads, for the project site;

ii. Proposed changes to the landscape of the site, grading, vegetation clearing and planting, exterior lighting, screening vegetation or structures;

Purpose: *The purpose of the site plan review is to determine that the use complies with all requirements set forth in this zoning bylaw and that the site design conforms to established standards regarding landscaping, access, and other zoning provisions.*

Additional Considerations: *As part of the implementation of an as-of-right large-scale ground-mounted solar photovoltaic bylaw, communities should consider amending their existing site plan review provisions in order to incorporate site plan review conditions that apply specifically to such installations.*

Note: *Under the state building code, work must commence within six (6) months from the date a building permit is issued; however, a project proponent may request an extension of the permit and more than one extension may be granted.*

iii. Blueprints or drawings of the solar photovoltaic installation signed by a Professional Engineer licensed to practice in the Commonwealth of Massachusetts showing the proposed layout of the system and any potential shading from nearby structures **iv.** One or three line electrical diagram detailing the solar photovoltaic

installation, associated components, and electrical interconnection methods, with all National Electrical Code compliant disconnects and overcurrent devices;
v. Documentation of the major system components to be used, including the PV panels, mounting system, and inverter;
vi. Name, address, and contact information for proposed system installer;
vii. Name, address, phone number and signature of the project proponent, as well as all co-proponents or property owners, if any;
viii. The name, contact information and signature of any agents representing the project proponent; and
(b) Documentation of actual or prospective access and control of the project site (see also Section 3.5);
(c) An operation and maintenance plan (see also Section 3.6);
(d) Zoning district designation for the parcel(s) of land comprising the project site (submission of a copy of a zoning map with the parcel(s) identified is suitable for this purpose);
(e) Proof of liability insurance; and
(f) A public outreach plan, including a project development timeline, which indicates how the project proponent will meet the required site plan review notification procedures and otherwise inform abutters and the community
The Site Plan Review Authority may waive documentary requirements as it deems appropriate.

3.5 Site Control

The project proponent shall submit documentation of actual or prospective access and control of the project site sufficient to allow for construction and operation of the proposed solar photovoltaic installation.

3.6 Operation & Maintenance Plan

The project proponent shall submit a plan for the operation and maintenance of the largescale ground-mounted solar photovoltaic installation, which shall include measures for

Additional Consideration for Smaller Solar Photovoltaic Installations: *The extensive site plan review documentation set forth in Section 3.4.2 of this model bylaw is not intended to apply to smaller solar photovoltaic installations. One of the key goals underpinning the Green Communities Program is the development of renewable and alternative energy generation. Communities should shape their bylaws to enable both large and small projects to proceed without undue delay.*

maintaining safe access to the installation, storm water controls, as well as general procedures for operational maintenance of the installation.

3.7 Utility Notification

No large- scale ground –mounted solar photovoltaic installation shall be constructed until evidence has been given to the Site Plan Review Authority that the utility company that operates the electrical grid where the installation is to be located has been informed of the solar photovoltaic installation owner or operator's intent to install an interconnected customer-owned generator. Off-grid systems shall be exempt from this requirement.

3.8 Dimension and Density Requirements

3.8.1 Setbacks

For large - scale ground-mounted solar photovoltaic installations, front, side and rear setbacks shall be as follows:
(a) Front yard: The front yard depth shall be at least 10 feet; provided, however, that where the lot abuts a Conservation-Recreation or Residential district, the front yard shall not be less than 50 feet.
(b) Side yard. Each side yard shall have a depth at least 15 feet; provided, however, that where the lot abuts a Conservation-Recreation or Residential district, the side yard shall not be less than 50 feet.
(c) Rear yard. The rear yard depth shall be at least 25 feet; provided, however, that where the lot abuts a Conservation-Recreation or Residential district, the rear yard shall not be less than 50 feet.

3.8.2 Appurtenant Structures

All appurtenant structures to large- scale ground-mounted solar photovoltaic installations shall be subject to reasonable regulations concerning the bulk and height of structures, lot area, setbacks, open space, parking and building coverage requirements. All such appurtenant structures, including but not limited to, equipment shelters, storage facilities, transformers, and substations, shall be architecturally compatible with each other. Whenever reasonable, structures should be shaded from view by vegetation and/or joined or clustered to avoid adverse visual impacts.

3.9 Design Standards

3.9.1 Lighting

Note: *Regulations governing appurtenant structures are typically contained in a town's zoning ordinance or bylaw.*

Note: *These setback distances are suggested values. Decreased setback distances may be appropriate. The municipality should evaluate what is appropriate for its designated location(s). Project developers may be encouraged to include screening vegetation along the borders of the site, to minimize the visual impact of the PV installation.*

Lighting of solar photovoltaic installations shall be consistent with local, state and federal law. Lighting of other parts of the installation, such as appurtenant structures, shall be limited to that required for safety and operational purposes, and shall be reasonably shielded from abutting properties. Where feasible, lighting of the solar photovoltaic installation shall be directed downward and shall incorporate full cut-off fixtures to reduce light pollution.

3.9.2 Signage

Signs on large- scale ground-mounted solar photovoltaic installations shall comply with a municipality's sign bylaw. A sign consistent with a municipality's sign bylaw shall be required to identify the owner and provide a 24-hour emergency contact phone number. Solar photovoltaic installations shall not be used for displaying any advertising except for reasonable identification of the manufacturer or operator of the solar photovoltaic installation.

3.9.3 Utility Connections

Reasonable efforts, as determined by the Site Plan Review Authority, shall be made to place all utility connections from the solar photovoltaic installation underground, depending on appropriate soil conditions, shape, and topography of the site and any requirements of the utility provider. Electrical transformers for utility interconnections may be above ground if required by the utility provider.

3.10 Safety and Environmental Standards

3.10.1 Emergency Services

The large scale solar photovoltaic installation owner or operator shall provide a copy of the project summary, electrical schematic, and site plan to the local fire chief. Upon request the owner or operator shall cooperate with local emergency services in developing an emergency response plan. All means of shutting down the solar photovoltaic installation shall be clearly marked. The owner or operator shall identify a responsible person for public inquiries throughout the life of the installation.

3.10.2 Land Clearing, Soil Erosion and Habitat Impacts

Clearing of natural vegetation shall be limited to what is necessary for the construction, operation and maintenance of the large – scale ground-mounted solar photovoltaic installation or otherwise prescribed by applicable laws, regulations, and bylaws.

3.11 Monitoring and Maintenance

3.11.1 Solar Photovoltaic Installation Conditions

The large - scale ground-mounted solar photovoltaic installation owner or operator shall maintain the facility in good condition. Maintenance shall include, but not be limited to, painting, structural repairs, and integrity of security measures. Site access shall be maintained to a level acceptable to the local Fire Chief and Emergency Medical Services. The owner or operator shall be responsible for the cost of maintaining the solar photovoltaic installation and any access road(s), unless accepted as a public way.

3.11.2 Modifications

All material modifications to a solar photovoltaic installation made after issuance of the required building permit shall require approval by the Site Plan Review Authority.

3.12 Abandonment or Decommissioning

3.12.1 Removal Requirements

Any large- scale ground-mounted solar photovoltaic installation which has reached the end of its useful life or has been abandoned consistent with Section 3.12.2 of this bylaw shall be removed. The owner or operator shall physically remove the installation no more than 150 days after the date of discontinued operations. The owner or operator shall notify the Site Plan Review Authority by certified mail of the proposed date of discontinued operations and plans for removal. Decommissioning shall consist of:

(a) Physical removal of all large- scale ground-mounted solar photovoltaic installations, structures, equipment, security barriers and transmission lines from the site.
(b) Disposal of all solid and hazardous waste in accordance with local, state, and federal waste disposal regulations.
(c) Stabilization or re-vegetation of the site as necessary to minimize erosion. The Site Plan Review Authority may allow the owner or operator to leave landscaping or designated below-grade foundations in order to minimize erosion and disruption to vegetation.

3.12.2 **Abandonment**.

Note: Recognizing that other remedies, such as a tax lien, are available to communities in the event an abandoned facility is legitimately putting public safety at risk this model zoning does not require the provision of surety to cover the cost of removal in the event the municipality must remove the installation and remediate the landscape. Communities can, however, require surety in circumstances where a valid planning purpose for doing so exists.

Revised March 2012

Model As-of-Right Zoning Ordinance or Bylaw: Allowing Use of Wind Energy Facilities

Prepared by: Department of Energy Resources Massachusetts Executive Office of Environmental Affairs

1.0 Purpose

The purpose of this bylaw is to provide standards for the placement, design, construction, operation, monitoring, modification and removal of wind facilities that address public safety, minimize impacts on scenic, natural and historic resources and to provide adequate financial assurance for the eventual decommissioning of such facilities.

The provisions set forth in this bylaw shall take precedence over all other bylaws when considering applications related to the construction, operation, and/or repair of land-based wind energy facilities.

1.1 Applicability

This section applies to all utility-scale and on-site wind facilities proposed to be constructed after the effective date of this section. This section also pertains to physical modifications to existing wind facilities that materially alter the type, configuration, location or size of such facilities or related equipment.

This section does not apply to off-shore wind systems.

2.0 Definitions

As-of-Right Siting: As-of-Right Siting shall mean that development may proceed without the need for a special permit, variance, amendment, waiver, or other discretionary approval. As-of-right development may be subject to non-discretionary site plan review to determine conformance with local zoning bylaws as well as state and federal law. As-of-right development projects that are consistent with zoning bylaws and with state and federal law cannot be prohibited.

Building Inspector: the inspector of buildings, building commissioner, or local inspector charged with the enforcement of the state building code.

Building Permit: The permit issued in accordance with all applicable requirements of the Massachusetts State Building Code (780 CMR).

This Model By-Law was prepared to assist cities and towns in establishing reasonable standards for wind power development. The by-law is developed as a model and not intended for adoption without specific review by municipal counsel.

Critical Electric Infrastructure (CEI): electric utility transmission and distribution infrastructure, including but not limited to substations, transmission towers, transmission and distribution poles, supporting structures, guy-wires, cables, lines and conductors operating at voltages of 13.8 kV and above and associated telecommunications infrastructure. CEI also includes all infrastructure defined by any federal regulatory agency or body as transmission facilities on which faults or disturbances can have a significant adverse impact outside of the local area, and transmission lines and associated equipment generally operated at voltages of 100 kV or higher, and transmission facilities which are deemed critical for nuclear generating facilities.

Designated Location: The location[s] designated by [the community's local legislative body] in accordance with M.G.L. c. 40A, section 5, where wind energy facilities may be sited as-of right. Said location[s] [is/are] shown on a Zoning Map [insert title of map]. This map is hereby made a part of this Zoning Bylaw and is on file in the Office of the [Town/City] Clerk.

Note: The "designated location" refers to the location within a community where wind power generation is permitted as-of-right. Establishment of a designated location for wind power generation is an integral part of the process of adopting an As-of-Right Wind Energy Facility Bylaw.

Legal Requirements: The process of designating the location must comport with the requirements of Section 5 of Chapter 40A of the Massachusetts General Laws which sets out the requirements for adopting and amending zoning bylaws.

Communities should keep in mind the requirements of the Green Communities Program. To qualify for designation as a Green Community, the designated area must provide a realistic and practical opportunity for development of wind power generation. An average wind speed of six meters per second at 50 meters elevation is considered the minimum wind speed for commercial scale wind generation, however, the potential for power generation increases exponentially with increased average wind speeds.

To satisfy the as-of-right zoning requirement contained in the Green Communities Act, the as-of-right bylaw must allow for wind energy facilities that utilize at least one turbine with a rated nameplate capacity of 600 kW or more.

Methods of Designating a Location: Communities may designate locations by reference to geographically specific zoning districts. In the alternative, communities may create an overlay district consisting of all or portions of multiple preexisting zoning districts, where wind power generation is permitted by right. In designating a location, it is important for the community implementing the zoning bylaw to consider the availability of wind and particular characteristics of the local community.

Height: The height of a wind turbine measured from natural grade to the tip of the rotor blade at its highest point, or blade-tip height. This measure is also commonly referred to as the maximum tip height (MTH).

Rated Nameplate Capacity: The maximum rated output of electric power production equipment. This output is typically specified by the manufacturer with a —nameplate on the equipment.

Site Plan Review Authority: Refers to the body of local government designated by the municipality to review site plans.

Utility-Scale Wind Energy Facility: A commercial wind energy facility, where the primary use of the facility is electrical generation to be sold to the wholesale electricity markets.

Wind Energy Facility: All of the equipment, machinery and structures together utilized to convert wind to electricity. This includes, but is not limited to, developer-owned electrical equipment, storage, collection and supply equipment, service and access roads, and one or more wind turbines.

Wind Monitoring or Meteorological Tower: A temporary tower equipped with devices to measure wind speed and direction, to determine how much electricity a wind energy facility can be expected to generate.

Wind Turbine: A device that converts kinetic wind energy into rotational energy to drive an electrical generator. A wind turbine typically consists of a tower, nacelle body, and a rotor with two or more blades.

Zoning Enforcement Authority: The person or board charged with enforcing the zoning bylaws.

Note: The height of the wind energy facility will have a direct impact on the amount of power it generates. While actual outputs vary, a wind turbine that is 250 feet tall will have an average nameplate capacity of roughly 660 kW, whereas a turbine that is 450 feet will have an average nameplate capacity of roughly 1.5 to 2.0 MW.

As previously mentioned, to satisfy the as-of-right zoning requirement contained in the Green Communities Act, the as-of-right bylaw must allow for the construction and operation of wind generation facilities that utilize at least one turbine with a rated nameplate capacity of 600 kW or more.

Actual generating capacity must be considered not only in terms of tower height, but also in light of average wind speeds at a given location.

3.0 General Requirements for all Wind Energy Facilities

The following requirements are common to all wind energy facilities to be sited in designated locations.

3.1 Compliance with Laws, Ordinances and Regulations

The construction and operation of all such proposed wind energy facilities shall be consistent with all applicable local, state and federal requirements, including but not limited to all applicable safety, construction, environmental, electrical, communications and aviation requirements.

3.2 Building Permit and Building Inspection

No wind energy system shall be erected, constructed, installed or modified as provided in this section without first obtaining a building permit.

3.3 Fees

The application for a building permit for a wind energy system must be accompanied by the fee required for a building permit.

3.4 Site Plan Review

No wind energy facility shall be erected, constructed, installed or modified as provided in this section without first undergoing site plan review by the Site Plan Review Authority.

3.4.1 General

All plans and maps shall be prepared, stamped and signed by a professional engineer licensed to practice in Massachusetts.

Note: By state statute, this may be the “inspector of buildings, building commissioner or local inspector, or if there are none, in a town, the board of selectmen, or person or board designated by local ordinance or by-law”. MGL 40A § 7. In many communities, the building inspector is the person charged with enforcing both the state’s building code and local zoning bylaws.

Purpose: The purpose of the site plan review is to determine that the use complies with all requirements set forth in this zoning by-law and that the site design conforms to established standards regarding landscaping, access, noise and other zoning provisions.

Additional Considerations: As part of the implementation of an as-of-right wind energy bylaw, communities should consider amending their existing site plan review provisions in order to incorporate site plan review conditions that apply specifically to wind energy facilities.

Note: Under the state building code, work must commence within six (6) months from the date a building permit is issued, however, a project proponent may request an extension of the permit and more than one extension may be granted.

3.4.2 Required Documents

Pursuant to the site plan review process, the project proponent shall provide the following documents:

(a) A site plan showing:

i. Property lines and physical dimensions of the site parcel and adjacent parcels within 500 feet of the site parcel;

ii. Outline of all existing buildings, including purpose (e.g. residence, garage, etc.) on site parcel and all adjacent parcels within 500 feet of the site parcel, including distances from the wind facility to each building shown;

iii. Location of the proposed tower, foundations, guy anchors, access roads, and associated equipment;

iv. Location of all existing and proposed roads, both public and private, and including temporary roads or driveways, on the site parcel and adjacent parcels within 500 feet of the site parcel;

v. Location of all existing above ground or overhead gas or electric infrastructure, including Critical Electric Infrastructure, and utility rights of way (ROW) and easements, whether fully cleared of vegetation or only partially cleared, within 500 feet of the site parcel;

vi. Existing areas of tree cover, including average height of trees, on the site parcel and any adjacent parcels within a distance, measured from the wind turbine foundation, of 3.0 times the MTH.;

vii. Proposed changes to the landscape of the site, grading, vegetation clearing and planting, exterior lighting (other than FAA lights), screening vegetation or structures;

viii. Tower foundation blueprints or drawings signed by a Professional Engineer licensed to practice in the Commonwealth of Massachusetts;

ix. Tower blueprints or drawings signed by a Professional Engineer licensed to practice in the Commonwealth of Massachusetts;

x. One or three line electrical diagram detailing wind turbine, associated components, and electrical interconnection methods, with all National Electrical Code and National Electrical Safety Code compliant disconnects and overcurrent devices;

xi. Documentation of the wind energy facility's manufacturer and model, rotor diameter, tower height, tower type (freestanding or guyed), and foundation type/dimensions;

xii. Name, address, phone number and signature of the applicant, as well as all co- applicants or property owners, if any;

xiii. The name, contact information and signature of any agents representing the applicant; and

xiv. A maintenance plan for the wind energy facility;

(b) Documentation of actual or prospective access and control of the project site (see also Section 3.5), together with documentation of all applicable title encumbrances (e.g. utility ROW easements);

(c) An operation and maintenance plan (see also Section 3.6);

(d) A location map consisting of a copy of a portion of the most recent USGS Quadrangle Map, at a scale of 1:25,000, showing the proposed facility site, including turbine sites, and the area within at least two miles from the facility.

Zoning district designation for the subject parcel should be included; submission of a copy of a zoning map with the parcel identified is suitable for this purpose;

(e) Proof of liability insurance, in amounts commensurate with the risks;

(f) Certification of height approval from the FAA;

(g) A statement that evidences the wind energy facility's conformance with Section 3.10.6, listing existing ambient sound levels at the site and maximum projected sound levels from the wind energy facility; and

(h) Description of financial surety that satisfies Section 3.12.3.

(i) A public outreach plan, including a project development timeline, which indicates how the project proponent will meet the required site plan review notification procedures and otherwise inform abutters and the community.

The Site Plan Review Authority may waive documentary requirements for good cause shown.

3.5 Site Control

The applicant shall submit documentation of actual or prospective access and control of the project site sufficient to allow for installation and operation of the proposed wind energy facility. Control shall include the legal authority to prevent the use or construction of any structure for human habitation, or inconsistent or interfering use, within the setback areas.

3.6 Operation & Maintenance Plan

The applicant shall submit a plan for maintenance of access roads and storm water controls, as well as detailed procedures for operational maintenance of the wind facility that are in accordance with manufacturer's recommendations for the period of expected operation of such facility. A facility that is not being maintained in accordance with the submitted plan and manufacturer's recommendations shall cease operation until such time as the facility is brought into compliance with the maintenance plan and manufacturer's recommendations.

3.7 Utility Notification

No site plan for the installation of a wind energy facility shall be approved until evidence has been given that the electric utility company that operates the electrical grid where the facility is to be located has been informed of the customer's

intent to install an interconnected customer-owned generator, and copies of site plans showing the proposed location have been submitted to the utility for review. No installation of a wind energy facility should commence and no interconnection shall take place until an

Additional Consideration (expedited site plan review for smaller wind energy facilities):

The extensive site plan review documentation set forth in Section 3.4.2 of this model bylaw may not be appropriate for smaller wind energy facilities, such as those utilizing turbines under 150 feet in height. Accordingly, communities should consider incorporating a provision in their bylaw that allows smaller wind energy projects to undergo a site plan review with fewer required documents. One of the key goals underpinning the Green Communities Program is the development of renewable and alternative energy capacity. Communities should shape their bylaws to enable both large and small wind energy projects to proceed without undue delay.

—Interconnection Agreement pursuant to applicable tariff and consistent with the requirements for other generation has been executed with the utility. Off-grid systems shall be exempt from this requirement, unless they are proposed to be located within setback distance from the sideline of an existing utility ROW.

3.8 Temporary Meteorological Towers (Met Towers)

A building permit shall be required for stand-alone temporary met towers. No site plan review shall be required for met towers. Met towers shall not be located within setback distance from the sideline of any utility ROW.

3.9 Design Standards

3.9.1 Appearance, Color and Finish

Color and appearance shall comply with Federal Aviation Administration (FAA) safety requirements.

3.9.2 Lighting

Wind turbines shall be lighted only if required by the FAA. Lighting of other parts of the wind energy facility, such as appurtenant structures, shall be limited to that required for safety and operational purposes, and shall be reasonably shielded from abutting properties. Except as required by the FAA, lighting of the wind energy facility shall be directed downward and shall incorporate full cut-off fixtures to reduce light pollution.

3.9.3 Signage

Signs on wind energy facilities shall comply with the Town's sign by-law. The following signs shall be required:

(a) Those necessary to identify the owner, provide a 24-hour emergency contact phone number, and warn of any danger.

(b) Educational signs providing information about the facility and the benefits of renewable energy.

Wind turbines shall not be used for displaying any advertising except for reasonable identification of the manufacturer or operator of the wind energy facility.

3.9.4 Utility Connections

Reasonable efforts, as determined by the Site Plan Review Authority, shall be made to place all developer-owned utility connections from the wind energy facility underground, depending on appropriate soil conditions, shape, and topography of

the site and any requirements of the utility provider. Utility owned electrical equipment required for utility interconnections may be above ground, if required by the utility provider.

Note: Under the state building code, work must commence within six (6) months from the date a building permit is issued, however, a project proponent may request an extension of the permit and more than one extension may be granted.

3.9.5 Appurtenant Structures

All appurtenant structures to wind energy facilities shall be subject to applicable regulations concerning the bulk and height of structures, lot area, setbacks, open space, parking and building coverage requirements. All such appurtenant structures, including but not limited to, equipment shelters, storage facilities, transformers, and substations, shall be architecturally compatible with each other and contained within the turbine tower whenever technically and economically feasible. Whenever reasonable, structures should be shaded from view by vegetation and/or located in an underground vault and joined or clustered to avoid adverse visual impacts.

3.9.6 Height

The height (MTH) of wind energy facilities shall not exceed 450 feet in height.

3.10 Safety and Environmental Standards

3.10.1 Emergency Services

The applicant shall provide a copy of the project summary, electrical schematic, and site plan to the police and fire departments, and/or the local emergency services entity designated by the local government, as well as the local electrical utility company. Upon request the applicant shall cooperate with local emergency services in developing an emergency response plan. All means of disconnecting the wind energy facility shall be clearly marked. The applicant or facility owner shall identify a responsible person for public inquiries or complaints throughout the life of the project.

3.10.2 Unauthorized Access

Wind energy facilities shall be designed to prevent unauthorized access. For instance, the towers of wind turbines shall be designed and installed so that step bolts or other climbing features are not readily accessible to the public and so that step bolts or other climbing features are not installed below the level of 8 feet above the ground. Electrical equipment shall be locked where possible.

3.10.3 Setbacks

Note: Regulations governing appurtenant structures are typically contained in a town’s zoning bylaw.

Note: A turbine height of 450 feet is used for illustration purposes only. Communities may set a height limit that is less than 450 feet, provided that the limit selected allows for the as-of-right construction and operation of turbines with a rated nameplate capacity of 600 kW or more.

Currently, a land-based turbine that is 450 feet in height is considered a large turbine. Periodically, communities may wish to revisit their siting criteria to ensure that they reflect industry standards as well as Green Communities Act requirements.

A wind turbine may not be sited within:

(a) a distance equal to one and one-half (1.5) times the maximum tip height (MTH) of the wind turbine from buildings, critical infrastructure—including Critical Electric Infrastructure and above-ground natural gas distribution infrastructure—or private or public ways that are not part of the wind energy facility;

(b) a distance equal to three (3.0) times the maximum tip height (MTH) of the turbine from the nearest existing residential or commercial structure; or

(c) a distance equal to one and one-half (1.5) times the maximum tip height (MTH) of the turbine from the nearest property line, and private or public way.

3.10.5 Shadow/Flicker

Wind energy facilities shall be sited in a manner that minimizes shadowing or flicker impacts. The applicant has the burden of proving that this effect does not have significant adverse impact on neighboring or adjacent uses.

3.10.6 Sound

The operation of the wind energy facility shall conform with the provisions of the Department of Environmental Protection's, Division of Air Quality Noise Regulations (310 CMR 7.10).

Educational Note: Shadow flicker is caused by sunlight passing through the swept area of the wind turbine's blades. As sunlight passes through the spinning blades, it is possible to have a stroboscopic effect that can, under the right conditions, affect persons prone to epilepsy. In general, these conditions require varying light intensity at frequencies of 2.5-3 Hz. Large commercial turbines are typically limited to a frequency of less than 1.75 Hz. Furthermore, the impacts of shadow flicker diminish rapidly with distance and should be minimal at 10 or more rotor diameters. Though the RPM for smaller turbines is generally higher (up to 350 RPM, for some turbines), the small size of the rotor swept area, combined with the shorter tower heights, support a negligible shadow flicker impact from these types of facilities. In any case, the effects of shadow flicker are a seasonal and/or diurnal impact, requiring that the sun be at the right position in the sky to generate a line of sight with the affected building and the wind turbine rotor. As such, the impacts of shadow flicker will generally only be felt for a few hours per year.

3.10.7 Land Clearing, Soil Erosion and Habitat Impacts

Clearing of natural vegetation shall be limited to that which is necessary for the construction, operation and maintenance of the wind energy facility or otherwise prescribed by applicable laws, regulations, and bylaws, and subject to existing easements, restrictions and conditions of record.

3.11 Monitoring and Maintenance

3.11.1 Wind Energy Facility Conditions

The applicant shall maintain the wind energy facility in good condition. Maintenance shall include, but not be limited to, painting, structural repairs, emergency braking (stopping) and integrity of security measures. Site access shall be maintained to a level acceptable to the local Fire Chief and Emergency Medical Services. The project owner shall be responsible for the cost of maintaining the wind energy facility and any access road(s), unless accepted as a public way.

3.11.2 Modifications

All material modifications to a wind energy facility made after issuance of the required building permit shall require approval by the Site Plan Review Authority.

3.12 Abandonment or Decommissioning

3.12.1 Removal Requirements

Any wind energy facility which has reached the end of its useful life or has been abandoned shall be removed. The owner/operator shall physically remove the facility no more than 150 days after the date of discontinued operations. The applicant shall notify the Site Plan Review Authority by certified mail of the proposed date of discontinued operations and plans for removal. Decommissioning shall consist of:

(a) Physical removal of all wind turbines, structures, equipment, security barriers and transmission lines from the site.

Educational Note: According to the Division of Air Quality Control Policy, a source of sound will be considered to be violating 310 CMR 7.10 if the source:

(a) Increases the broadband sound level by more than 10 dB(A) above ambient, or

(b) Produces a —pure tone condition – when an octave band center frequency sound pressure level exceeds the two adjacent center frequency sound pressure levels by 3 decibels or more.

These criteria are measured both at the property line and at the nearest inhabited structure. Ambient is defined as the background A-weighted sound level that is exceeded 90% of the time measured during equipment hours. The ambient may also be established by other means with consent from the DEP.

(b) Disposal of all solid and hazardous waste in accordance with local, state, and federal waste disposal regulations.

(c) Stabilization or re-vegetation of the site as necessary to minimize erosion. The Site Plan Review Authority may allow the owner to leave landscaping or designated below-grade foundations in order to minimize erosion and disruption to vegetation.

3.12.2 Abandonment

Absent notice of a proposed date of decommissioning or written note of extenuating circumstances, the wind energy facility shall be considered abandoned when the facility fails to operate for more than one year without the written consent of the Site Plan Review Authority. If the applicant fails to remove the facility in accordance with the requirements of this section within 150 days of abandonment or the proposed date of decommissioning, the town may enter the property and physically remove the facility

3.12.3 Financial Surety

Applicants for utility-scale wind energy facilities shall provide a form of surety, either through escrow account, bond or otherwise, to cover the cost of removal or failure to maintain, in the event the town must maintain or remove the facility and remediate the landscape, in an amount and form determined to be reasonable by the Site Plan Review Authority, but in no event to exceed more than 125 percent of the cost of removal and compliance with the additional requirements set forth herein, as determined by the applicant. Such surety will not be required for municipally or state-owned facilities. The applicant shall submit a fully inclusive estimate of the costs associated with removal, prepared by a qualified engineer. The amount shall include a mechanism for calculating increased removal costs due to inflation.

EXPEDITED PERMITTING OPTIONS Fall 2018

INTRODUCTION

Criteria Two of the Green Communities Program states that communities need to adopt an ***expedited application and permitting process*** under which as-of-right energy facilities (criterion #1) may be sited within the municipality and which shall not exceed 1 year from the date of initial application to the date of final approval.

Such an expedited application and permitting process applies only to the proposed facilities which are subject to the as-of-right siting provisions, and documentation that all permits necessary to site proposed facilities can be issued within the 1 year deadline is required.

Note: Municipalities can also meet this requirement by applying the expedited permitting process of MGL Chapter 43D to the as-of-right zoning district(s), which has a one hundred and eighty day (180) deadline requirement.

COMPLIANCE

Standard One Year Process

To meet this criterion municipalities need to have rules and regulations in place governing permit issuance such that all local permitting decisions - formal determinations, orders of conditions, licenses, certificates, authorizations, registrations, plan approvals, or other approvals or determinations with respect to the use, development or redevelopment of land, buildings, or structures required by any issuing authority – applicable to the siting and construction of clean energy facilities within the relevant zoning district(s) can be issued within 1 year of submission of a completed application.

In regard to documentation, municipalities will have already demonstrated that they have by-right zoning allowing clean energy facilities (criterion #1). Thus, communities need to show that other provisions of the zoning (e.g. site plan review), as well as other local regulations, allow permitting within one year. In order to document compliance with the Green Communities expedited permitting criterion (criterion #2) municipalities must provide DOER a letter from legal counsel affirming that nothing within the municipality's rules and regulations precludes issuance of a permitting decision within one year along with the language addressing approval procedures and associated timing from any applicable bylaws/ordinances or regulations.

Municipalities should also be aware that once designated a Green Community they will be required to report annually on their permitting of clean energy projects within as-of-right zoning districts. Communities not adhering to the 365 day permitting requirement will be at serious risk of losing their Green Community designation.

MGL c 43D Priority Development Sites

A municipality may also meet the Green Communities expedited permitting criterion by providing for as-of-right siting of renewable or alternative energy generation or manufacturing or research and development (R&D) facilities within a Priority Development site approved pursuant to Chapter 43D by the interagency Permitting Board. The municipality will be required to provide documentation that demonstrates that the designated as-of-right zoned area and the 43D Priority Development Site overlap. If meeting the criterion by allowing the by-right construction of either renewable or alternative energy (R&D) or manufacturing facilities, the municipality will be required to provide a letter from the municipality's legal counsel providing documentation that a Priority Development Site approved pursuant to Chapter 43D by the Interagency Permitting Board applies to enough land within the district zoned for the by-right siting of energy facilities to construct at least 50,000 square feet of (R&D) or manufacturing space in the aggregate. However, communities are encouraged to make the procedures expediting the permitting of renewable or alternative energy projects uniform throughout a zoning district in order to avoid confusion and facilitate siting and construction of renewable or alternative energy facilities.

Note: The materials developed to assist communities with issuance of permits within 180 days as required by Chapter 43D will also help communities looking to expedite permitting for the purpose of becoming a Green Community.

FOR MORE INFORMATION

43D Website:

Criterion Four of the Green Communities Program states that communities must purchase only fuel-efficient vehicles for municipal use whenever such vehicles are commercially available and practicable. The purpose behind this criterion is to reduce carbon dioxide emissions by municipal vehicles, which has a positive impact on the environment and saves municipalities money.

Vehicles that are **exempt** from the municipal Fuel Efficient Vehicle Policy include motorcycles and heavy-duty vehicles defined as having a manufacturer's gross vehicle weight rating (GVWR) of more than 8,500 pounds.

Examples include fire engines, ambulances, and some public works vehicles. In addition, police cruisers, passenger vans, and cargo vans are exempt from this criterion; however, municipalities must commit to purchasing fuel efficient cruisers, passenger vans, and cargo vans when they become commercially available.

Police and fire department administrative vehicles MUST meet fuel efficient requirements.

Emergency Response vehicles that are under 8,500 pounds and for which fuel efficient models are available are NOT exempt.

Stretch Code Adoption Process August 2018

INTRODUCTION

In accordance with M.G.L. c 25A Section 10, a municipality must require all new residential construction over 3,000 square feet and all new commercial and industrial real estate construction to minimize, to the extent feasible, the life-cycle cost of the facility by utilizing energy efficiency, water conservation and other renewable or alternative energy technologies.

The recommended way for cities and towns to meet this requirement is by adopting the Board of Building Regulations and Standards (BBRS) Stretch Energy Code (780 CMR 115.AA), an appendix to the MA State Building Code. Should a community choose to not adopt the Stretch Code and choose to use another standard, the community must provide evidence that this alternative standard minimizes the life cycle energy costs for all new construction and is enforceable by the community.

The purpose of the Stretch Energy Code is to provide a more energy efficient alternative to the Base Energy Code for new buildings. A municipality seeking to ensure that construction within its boundaries is designed and built to the highest energy efficiency requirements of 780 CMR (i.e., the "Base" Energy Code) may mandate adherence to the Stretch Energy Code. Municipalities interested in adopting 780 CMR 115.AA, the Stretch Energy Code, are directed to do so in the manner prescribed by law. The code may also be rescinded by any municipality in the Commonwealth in the manner prescribed by law.

Municipalities that have adopted the stretch energy code shall use the energy efficiency requirements of appendix 780 CMR 115.AA, which stipulates higher energy efficiency requirements for most new construction.

PROCESS for ADOPTION

Towns are advised to seek adoption of the Stretch Code as a general bylaw through a vote of Town Meeting.

Please note, once the Stretch Code is adopted by a municipality, all future editions, amendments and modifications of the Stretch Code are automatically adopted unless the municipality rescinds adoption of the Stretch Code itself. A community must adopt the Stretch Code "as is," without applying any amendments or conditions.

Also note, according to the Attorney General's office:

> *Pursuant to G.L. c.40, S 32, neither general nor zoning by-laws take effect unless the town has first satisfied the posting/publishing requirements of that statute. Once this statutory duty is fulfilled, general by-laws and amendments take effect on the date that these posting and publishing requirements are satisfied unless a later effective date is prescribed in the by-law …*

DOER recommends that the warrant article, the motion and the by-law/ordinance explicitly specifies an effective date so that everyone (building officials, builders, homeowners, voters) is fully aware of when the Stretch Energy Code takes effect. It is further recommended that municipalities choose either July 1 or January 1 as the effective date (whichever comes 'next' after the vote).

The following sample article, sample motion, and sample bylaw/ordinance are provided as examples:

SAMPLE TOWN WARRANT ARTICLE:

To see if the Town will vote to enact Chapter

of the Town of

_General Bylaws, entitled "Stretch

Energy Code" for the purpose of regulating the design and construction of buildings for the effective use of energy, pursuant to Appendix 115.AA of the Massachusetts Building Code, 780 CMR, the Stretch Energy Code, including future editions, amendments or modifications thereto, with an effective date of a copy of which is on file with the Town Clerk, or take any other action relative thereto.

SAMPLE TOWN MEETING MOTION:

I move that the Town will enact Chapter __of the Town of __General Bylaws, entitled "Stretch Energy Code" for the purpose of regulating the design and construction of buildings for the effective use of energy, pursuant to Appendix 115.AA of the Massachusetts Building Code, 780 CMR, the Stretch Energy Code, including future editions, amendments or modifications thereto, with an effective date of _____ .

SAMPLE BYLAW follows:

Chapter ____
STRETCH ENERGY CODE
[Adopted 0-0-2018 TM / STM by Art.]

- **§ -1 Definitions**
- **§ -2 Purpose**
- **§ -3 Applicability**
- **§ -4 Stretch Code**

§ -1 Definitions

International Energy Conservation Code (IECC) - The International Energy Conservation Code (IECC) is a building energy code created by the International Code Council. It is a model code adopted by many state and municipal governments in the United States for the establishment of minimum design and construction requirements for energy efficiency, and is updated on a three-year cycle. The baseline energy conservation requirements of the MA State Building Code are the IECC with Massachusetts amendments, as approved by the Board of Building Regulations and Standards.

Stretch Energy Code - Codified by the Board of Building Regulations and Standards as 780 CMR Appendix 115.AA of the Massachusetts building code, the Stretch Energy Code is an appendix to the Massachusetts building code, based on further amendments to the International Energy Conservation Code (IECC) to improve the energy efficiency of buildings built to this code.

§ -2 Purpose

The purpose of 780 CMR 115.AA is to provide a more energy efficient alternative to the Base Energy Code applicable to the relevant sections of the building code for new buildings.

§ -3 Applicability

This code applies to residential and commercial buildings. Buildings not included in this scope shall comply with 780 CMR 115.AA, as indicated.

§ -4 Stretch Code

The Stretch Code, as codified by the Board of Building Regulations and Standards as 780 CMR Appendix 115.AA, including any future editions, amendments or modifications, is herein incorporated by reference into the Town of_____General Bylaws, Chapter _. The Stretch Code is enforceable by the inspector of buildings or building commissioner and effective as of _____.