



Town of Middleton Planning Board

Proposed Amendment to Zoning Ordinance.

Summary: Newly proposed Solar Ordinance

SOLAR ORDINANCE

A. PURPOSE

The purpose of this Ordinance is to accommodate solar energy collection systems and distributed generation resources in appropriate locations while protecting the public's health, safety, and welfare. The Town intends to facilitate the State and National goals of developing clean, safe, renewable energy resources in accordance with the enumerated policies of NH RSA 374-G and 362-F that, include national security and economic and environmental sustainability.

B. AUTHORITY

This solar collection system ordinance is enacted in accordance with NH RSA 674:17(I)(j) and the purposes outlined in NH RSA 672:1-III-a as amended.

C. APPLICABILITY

This Ordinance does not cover Solar installations designed to generate less than one kilowatt and is not connected to the electrical grid. However, they may be subject to other regulations.

- a. **Residential and Accessory Agricultural** – *The Town will permit rooftop solar installations of less than 15KW by right in all zoning districts. Ground-mounted solar systems that are 15KW or less and one thousand (1000) square feet or less will not need Planning Board approval but will require approval from the Planning Department's Building Inspector.*
- b. **Commercial** - *Any person seeking to construct or to conduct any Commercial Solar Energy System for commercial use as defined in Article 36 of this Ordinance, shall apply to the Planning Board for Site Plan Review in accordance with the requirements set forth in the Town Site Plan Review Regulations as well as a Conditional Use Permit. In addition, such applicant shall submit the information required in this Ordinance. If any property owner/s wishes to install a ground and/or pole-mounted Commercial Solar Energy System, they must come to the Planning Board for a Conditional Use Permit that shows they have met the conditions listed above, as well as any other conditions, such as protecting the view shed of neighbors and passersby's, which the Planning Board may feel necessary to be in the best interests of the town and abutting residents in light of the purposes of this Ordinance and the purposes of the zoning district(s) in which the property is located.*

[Date]

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D. GENERAL DEFINITIONS

Solar Access – Space open to the sun and clear of overhangs or shade so as to permit the use of active and/or passive solar energy systems on individual properties.

Building Integrated Photo Voltaic (BIPV) Systems- a solar energy system that integrates photo voltaic modules into the building structure, such as solar shingles on the roof or the facade, which does not alter the relief of the roof.

Collective Solar – Solar Installations owned collectively through subdivision homeowner associations, co-housing, and other similar arrangements.

Net Metering – A billing mechanism authorized by NH RSA 362-A and corresponding regulations, credits solar customers for surplus electricity they generate and deliver back to the grid and allows them to pay only for their net electricity usage during the applicable billing cycle.

Qualified Solar Installer – A NH licensed electrician with specialized knowledge and corresponding skills related to the installation, construction, and operation of solar electrical equipment and who has received safety training on the hazards involved with solar installation.

Residential – as defined in Article 36 of this Ordinance.

Solar Energy – Radiant energy provided by the sun that can be collected in the form of heat or light by a solar collector.

Solar Skyscape Easement—A recorded easement pursuant to NH RSA 477:51 sufficient to create a Solar Skyscape easement.

Solar Storage Battery – A device that reserves energy for later consumption that is charged by a connected solar connection system.

Solar Thermal Systems - System which converts solar radiation to thermal energy; system directly heats water or other liquid using sunlight; used for such purposes as space heating, cooking, domestic hot water, and heating pool water.

Rated Nameplate Capacity – Maximum-rated alternating current ("AC") output of solar collection system based on the design output of the solar system.

Solar Land Coverage – is defined exclusively to calculate the footprint of the land area occupied by the components of a solar array. The Solar Land Coverage is the land area that encompasses all elements of the solar collection system, including but not limited to mounting equipment, panels, and ancillary components of the system. This definition does not include access roads or fencing. It is not to be interpreted as a measurement of impervious surface as it may be defined in this Ordinance.

Solar Collection System - Includes all equipment required to harvest solar energy to generate electricity. The Solar Collection System includes storage devices, power conditioning equipment, transfer equipment, and parts related to the functioning of those items. Solar Collection Systems include only equipment up to (but not including) the stage that connection is made to the utility grid or site service point.

Roof-Mounted System – A solar collection system that is structurally mounted to the roof of a building or other permitted structure, including limited accessory equipment associated with the system, which may be ground mounted. It is installed parallel to the roof with a few inches gap. If the rooftop is flat, then the racking system is installed so



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the solar array is aligned at an angle. For calculating array sizes or solar land coverage under the solar definitions in this section, roof-mounted portions shall not be included if the system comprises roof and ground-mounted systems.

Ground-Mounted System – A solar collection system and associated mounting hardware affixed to or placed upon (such as ballasted systems) the Ground, including but not limited to fixed, passive, or active tracking racking systems.

Commercial Carport Mounted System – Any solar collection system of any size installed on a carport's roof structure over a parking area.

E. USE DEFINITIONS:

Accessory Residential Solar: Any ground-mounted or roof-mounted solar collection system primarily for on-site residential use and consisting of one or more free-standing, Ground or roof-mounted solar arrays or modules, or solar-related equipment, intended to primarily reduce on-site consumption of utility power and with a rated nameplate capacity of 20 kW AC or less and that is less than 1000 square feet solar land coverage.

Community Solar: A commercial land use, per Article 36 of this Ordinance, that consists of one or more free-standing, ground-mounted solar collection systems regardless of nameplate capacity of up to 100 kW AC and less than 1 acre of solar land coverage and is intended for on-site consumption by a community group.

Accessory Agriculture Solar: Any ground-mounted or roof-mounted solar collection system designed to primarily reduce on-site consumption of utility power without a limit to the rated nameplate capacity or solar land coverage, provided the existing agricultural use is preserved during installation.

Primary Agriculture Solar: Any ground-mounted solar collection system that is partially used to reduce on-site consumption of utility power and with a rated nameplate capacity of up to 1 MW AC in size or has a solar land coverage in excess of 5 acres provided the existing agricultural use is preserved at the time of installation where the excess power is sold to the utility company.

Small Commercial Solar: A land use that consists of one or more free-standing, ground-mounted solar collection systems with a rated nameplate capacity of up to 1 MW AC and less than 5 acres in solar land coverage.

Large Commercial Solar: A land use consisting of one or more free-standing, ground-mounted solar collection systems with a rated nameplate capacity of between 1 MW and 5 MW and between 5 and 25 acres in solar land coverage.

Industrial Solar: A land use that consists of one or more free-standing, ground-mounted solar collection systems, regardless of nameplate capacity, between 5 acres and 50 acres in solar land coverage.

Utility Solar: A land use that consists of one or more free-standing, ground-mounted solar collection systems regardless of nameplate capacity over 50 acres in solar land coverage and less than 30 MW in rated nameplate capacity.

Solar Power Generation Station: Any solar collection system over 30 MW in nameplate capacity. In no case shall a Solar Power Generation Station exceed 150 acres.



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Table of Permitted Solar Uses

	Zoning District					
	Sunrise Lake Village District SRL	Residential- Commercial /Industrial B-1	Rural Residential RR	Middleton 4 Corners M4C	Commercial	Industrial
Accessory Residential Solar	P	P	P	P	P	P
Community Solar	X	P	P	P	P	P
Accessory Agricultural Solar	X	P	P	P	P	P
Primary Agricultural Solar	X	X	CUP	P	P	P
Commercial Solar	X	X	CUP	CUP	P	P
Large Commercial Solar	X	X	X	CUP	CUP	CUP
Industrial Solar	X	X	X	X	CUP	CUP
Utility Solar	X	X	X	X	CUP	CUP
Solar Power Generation Station	X	X	X	X	X	CUP

P = Use permitted by right with building and electrical permit.

CUP = Use permitted by Conditional Use Permit.

X = Use prohibited.

Site plan review is required for all solar uses except for Accessory Residential Solar and Accessory Agricultural Solar, following the Site Plan Review Regulations.

F. SPECIFIC SOLAR SYSTEM REQUIREMENTS AND EXEMPTIONS:

- a. A ground-mounted Accessory Residential Solar system shall not exceed the building height described in Article 6, Section A, paragraph 4 of this Ordinance at any point and shall be located in the rear yard between the primary structure and the rear lot line.
- b. A Commercial Use, as defined in Article 36 of this Ordinance, carport-mounted solar collection systems over parking areas are permitted in all zones without a Conditional Use Permit. A site plan review is required in accordance with the Site Plan Review Regulations.
- c. Roof-mounted solar collection systems of any size are permitted in all zones without a conditional use permit.
- d. When adding solar panels to historic properties, it is recommended that the roof or ground-mounted solar panels be mounted in inconspicuous locations when possible and be screened to limit visibility.
- e. Municipal Systems: All solar collection systems for municipal use are exempt from land use regulations pursuant to NH RSA 674:54.
- f. Setbacks: Solar collection systems shall be considered structures, require building permits, and comply with building setback requirements from lot lines for the entire system – including the panels. Tracking systems shall measure the setback from the



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point and time where the array is closest to the lot line. No portion of a system may cross into the setback.

- g. Building Height: Roof-mounted solar collection systems shall be exempt from building height limitations.
- h. Lot Coverage: Ground-mounted solar collection systems shall not be considered part of the maximum required lot coverage limitations and shall not be considered impervious surfaces. Impervious surface limitations related to stormwater management for solar collection systems shall be addressed per this Ordinance.

G. ADDITIONAL PERMITTED SITES:

A. Solar Collection Systems of any size or type shall be permitted on the following sites if they remain Town-owned *municipal properties*:

1. *School Facilities: Map 12 Lot 24.*
2. *Municipal Building: Map 12 Lot 24-1.*
3. *Fire Station: Map 12 Lot 21*
4. *Old Town Hall: Map 12 Lot 20.*
5. *Highway Garage: Map 12 Lot 20-1.*
6. *Highway Department: Map 45 Lot 36, Lot 37.*
7. *Highway Department Ridge Road Pit: Map 12 Lot 24-2*
8. *Highway Department Gravel Pit:
Town of New Durham Map 219 Lot 12*

H. SOLAR COLLECTION SYSTEM CONDITIONAL USE PERMIT:

- A. The Planning Board encourages using tax maps, GIS, USGS, Google Earth, and other resources that provide enough detail to create a hand-drawn or computer-generated site plan for local land use board review. Engineers and Surveyors are required for larger projects or when critical environmental areas are present. Landscape architects or professional Landscapers may be engaged to address aesthetic concerns.
- B. All applications for a solar energy system conditional use permit shall be made to the Planning Board in accordance with the submission and procedural requirement for conditional use permits set forth in Article 33 of this Ordinance, as they may be amended, with the additional information as set forth in General Application Criteria below.

I. GENERAL APPLICATION CRITERIA:

A. System Layout Requirements

1. A detailed sketch or plan showing the installation area of the site.



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2. A detailed sketch of any land clearing or grading required for the installation and operation of the system.
3. The location of all equipment to be installed on-site, including utility connection point(s), storage battery, and equipment structures and equipment. To the maximum extent practical, all wiring associated with the utility connection shall be underground.
4. All equipment and structure locations, except for utility connections, shall comply with required setbacks.

B. Equipment Specification

1. All proposed equipment or specifications must be included with the application.
2. Such information can be supplied via manufacturer specifications or detailed descriptions.

C. Emergency Response

1. Access to the site for emergency response shall be provided and detailed in the plan.
2. A narrative or manual for the municipal Fire Department detailing response guidance and disconnection locations necessary for fire response.
3. Additional industry guidance documents that provide information about safety procedures for specific equipment on site shall be provided as needed to ensure adequate public safety.
4. Contact information for the solar collection system owner/operator shall be posted on-site at the access way and provided and updated to the Town.

D. Natural Resource & Views/Viewsheds Impacts and Buffers

1. Solar collection systems shall be visually screened through the preservation of existing vegetation or a landscaped buffer in accordance with the following.
 - a. Plan: The buffering plan shall indicate the location, height, and spacing of existing vegetation to be preserved, areas where new planting will be required, and a statement that the buffering shall be maintained for the project's lifespan.
 - b. All solar systems shall have a visual buffer as required in the site plan review regulations from public ways and neighboring commercial/residential uses based on the viewsheds, contours of the land, and abutting land uses.
 - c. Areas within the viewshed of significant value as identified in the Master Plan shall include additional reasonable mechanisms to mitigate from a continuous and uninterrupted view of the system.

E. Fencing shall be installed per the National Electrical Safety Code with a height of not less than 2.13 m (7 ft). Additionally, "Wildlife Friendly Fencing" is encouraged.

F. Primary Agriculture Solar should minimize impacts on farmland activities and Prime Farmland Soils (as defined and delineated by soil survey and definition of



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NH NRCS). Dual-use arrangements (solar and farming activities) are encouraged where practical.

1. Land clearing shall be limited to what is necessary for the installation and operation of the system and to ensure sufficient all-season access to the solar resource, given the land's topography.
2. Following construction, cleared land areas must be restored with native species consistent with the site's use as a solar collection system (such as slow growth or low ground cover).
3. The Planning Board Development Regulations shall detail erosion control measures during construction.

G. ADDITIONAL REQUIREMENTS FOR LARGE COMMERCIAL, INDUSTRIAL, AND UTILITY (LC/IU) SOLAR:

1. A licensed NH Professional Engineer shall prepare, and stamp all submitted plans, reports, and documentation.
2. A detailed pre-construction and post-construction plan identifying existing vegetation and areas to be cleared with specific identification of locations of buffer areas adjacent to neighboring uses and public ways.
3. LC/IU systems that disturb more than 10 acres of previously undisturbed land shall provide a natural resource inventory that details site conditions and habitat and mitigation efforts to reduce impacts to important species and habitats.
4. Efforts and practices that can provide for dual use of the site should be explored if feasible and encouraged where appropriate.
5. The applicant shall demonstrate effective stormwater infiltration, erosion control measures, and soil stabilization.

J. ELECTRICAL REQUIREMENTS.

1. The Electrical or Building Inspector shall approve all systems not connected to the grid, as required.
2. Grid-tied systems shall file a copy of a final approved interconnection with the Town prior to operation of the system.

K. GLARE.

An index measures glare and is required.

1. All proposed solar collection systems except for Accessory Residential Solar systems shall notify the Regional Federal Aviation Authority (FAA) Office and the local airport operator to inform the FAA operator about the proposed project and



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public hearing dates so that the agency can determine if the project presents any safety or navigational problems, especially if large.

2. A statement or study detailing potential significant glare onto abutting structures and roadways estimating the interaction of sun to panel angle, time of year, and visibility locations.
3. The Planning Board may require reasonable mitigation based on the above information. Mitigation may include the angle of panels, details on the anti-reflective nature of the panel coating, or any additional specific screening to minimize resulting impacts.
4. Mitigation through anti-reflective coatings shall have an index of refraction equal to or less than 1.30.

L. NOISE.

1. Estimates of equipment noise on the site based on equipment specification materials (such as inverters).
2. Noise levels at the property line shall be reasonable given the facility's location, with due consideration to the surrounding land uses and zone.

M. STORMWATER.

1. Ground-mounted systems that are required to secure a New Hampshire Department of Environmental Services Alteration of Terrain (AoT) Permit in accordance with NH RSA 485:17 shall apply for such permit. Receipt of the AoT permit shall be a condition precedent to any approval issued by the Planning Board for such a system.
 - a. The final Permit issued by NH DES shall be incorporated by reference into the final Town approval. It shall be enforceable by the Town in accordance with this zoning ordinance.
 - b. No further local review of stormwater and erosion control shall be required where a project is required to secure the NH DES AoT Permit.
2. Ground-mounted systems not requiring NH DES AoT Permit. Where a ground-mounted system does not require an AoT permit, the following shall apply:
 - a. If ground-mounted systems require land clearing and grubbing of mature forested cover to accommodate more than 30% of the solar land coverage area (provided such area of clearing and grubbing is also larger than 1 acre), the proposed system shall include a management plan for stormwater that is directly related to the impact of the solar collection system.
 - b. Ground-mounted systems where the solar land coverage area is larger than 1 acre and located on slopes greater than 5% shall include a management plan for stormwater.
3. The stormwater management plan shall include the following.



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- a. The stormwater study shall consider the nature of the solar panel installation and how the spacing, slope, and row separation can enhance stormwater infiltration. Percolation tests or site-specific soil information may be provided to demonstrate that recharge can be achieved without engineered solutions.
 - b. Additional information shall calculate the potential for concentrated runoff flows due to the panels, slope, soil type, and the impacts of other true impervious areas (such as equipment pads and roadways).
4. Required for all systems:
- a. All ground-mounted systems shall be constructed in accordance with NH DES and UNH Cooperative Extension Best Management Practices for erosion and sedimentation control during the pre-construction, construction, and post-construction restoration period.
 - b. Post-construction: To enhance natural stormwater management, site conditions, and plantings, shall ensure that soil compaction areas have been restored to more natural conditions. Plantings shall be native species and are recommended to be beneficial habitats to songbirds, pollinators, and/or foraging specifics to maintain a healthy surface and subsurface habitat that can attenuate stormwater on the site.
 - c. All plans shall include a stormwater Operation and Maintenance Plan for incidental and Non-Incidental Disturbances and shall have an Operations and Maintenance (O&M) Plan to ensure that systems function as designed.

M. LIGHTING.

On-site lighting shall comply with Development Regulations, Article 5.6.

N. BUFFER PLAN.BUFFER

All applications shall submit a detailed buffering plan demonstrating how the proposed ground-mounted solar installation will be incorporated into the local landscape to provide adequate screening along public ways and from abutting views. The use of evergreens is strongly recommended. The use of existing or created topography is encouraged to reduce visual impacts.

O. ABANDONMENT AND DECOMMISSIONING.

1. Solar Collection Systems shall be deemed to be abandoned if operations have been discontinued for more than 12 months without the written consent of the Town (such as for reasons beyond the control of the owner/operator). An abandoned system shall be removed, and the site restored within 12 months of abandonment.
2. The Planning Board shall require the applicant to post a surety in an amount approved by the Board to guarantee that an abandoned system is removed and the site restored within the required 12-month timeframe. A licensed NH Professional



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Engineer, approved by the Planning Board, shall calculate said surety amount for review and approval by the Board that secures the guarantee of satisfactory removal and restoration for the Town. This calculation work shall be at the expense of the applicant/owner.

Commented [CJ1]: Who chooses the engineer? The applicant or the board?

X. REQUIREMENTS FOR GRANTING A CONDITIONAL USE PERMIT (CUP):

Criteria:

1. Standards of Review: Following a fully noticed public hearing on the proposed use, the Planning Board may issue a Conditional Use Permit if it finds, based on the information and testimony submitted concerning the application, that:
 - a. The use is authorized explicitly by the Table of Principal and Accessory Uses as a conditional use as described under **Use Definitions** of this Solar Ordinance.
 - b. The development in its proposed location will comply with all applicable requirements of the Site Plan Review Regulations not otherwise covered in this section and specific conditions established by the Planning Board.
 - c. The use will not materially endanger the public health or safety.
 - d. Required adequate screening shall be installed and maintained during the operative lifetime of the Solar Collection System Conditional Use Permit. The applicant shall sign an agreement with the Planning Board, which shall run with the land for screening to be maintained until the system is removed and the property restored.
 - e. In granting a conditional use permit according to this section, the Planning Board may impose any reasonable conditions or restrictions deemed necessary to carry out the intended purpose of this Ordinance.

Y. SITE PLAN REVIEW REGULATIONS APPLICABLE.

1. The specific requirements for a Conditional Use Permit shall preempt any similar requirement in the Site Plan Review Regulations.



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Appendix:

This appendix includes images and information about several types of solar installations and equipment.



Completed installation showing gaps between panels



Ballasted system, showing the distance between rows and the ballast blocks.



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Racking equipment – before panel installation.





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Commercial Carport Mounting



Residential Ground mounted system.





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Pole-mounted system – agricultural site.



Tracker Mounted Residential System: Courtesy Revision Energy

Note: Examples of buffered systems:



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Great Hill Farm barn in Tamworth