

**SOLAR ENERGY SYSTEMS** —comments by Robin Mower, 10/9/18

**DRAFT ORDINANCE - Durham, New Hampshire**

*Revised draft presented for new public hearing at Planning Board meeting on September 12*

Proposed amendments to the Durham Zoning Ordinance to accommodate solar energy systems.

❖ *Make the following changes in Article II. Definitions.*

- *Add this new section for “Solar Energy Systems.” Place this section right before “Solid Waste” and retain the order as shown here.*

SOLAR ENERGY SYSTEMS – Specific definitions pertinent to solar energy systems follow.

Solar Energy – Radiant energy emitted by the sun.

Solar Energy System – A structure and the related components used to transform solar energy into electricity, including a solar photovoltaic system and a solar thermal system.

MOWER COMMENT: Broaden the definition to read:

Solar energy devices or design features of a structure that are used for the collection, storage, and distribution of solar energy for space heating, space cooling, lighting, electric generation, or water heating, including solar photovoltaic and/or solar thermal systems.

REFERENCE TEXT

Solar Energy System: Solar energy devices or design features of a structure used for the collection, storage, and distribution of solar energy for space heating, space cooling, lighting, electric generation, or water heating.

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Including storage in the definition will accommodate the anticipated growth in battery storage devices linked to solar energy systems....

[Day, Megan. “Best Practices in Zoning for Solar.” April 21, 2017 <<https://www.nrel.gov/state-local-tribal/blog/posts/best-practices-in-zoning-for-solar.html>> (National Renewable Energy Laboratory, U.S. Department of Energy, Office of Energy Efficiency and Renewable Energy)

Solar Photovoltaic System – A solar collection, inversion, storage and distribution system that converts sunlight into electricity.

Solar Thermal System – A solar collection system that directly heats a heat-transfer medium.

Roof- or Building-Mounted Solar Energy System – A solar energy system attached to and completely supported by a building and not extending beyond the building footprint more

than 5 feet. The system may include limited accessory equipment that is ground-mounted. A single-family or duplex residential solar energy system or a multiunit residential or nonresidential solar energy system that is installed on a carport is considered a roof- or building-mounted solar energy system.

MOWER QUERIES: Should the word “building” be replaced with “structure”? How would a system mounted on a parking garage be classified?]

MOWER COMMENT: A reasonable height limit for the mounted system would be in keeping with the height limits we have agreed to for buildings for similar reasons and is found in other communities’ ordinances. The applicant is always welcome to seek a variance. I understand that the Board removed the 5-foot “overage” language at its last meeting, but I object. Imagine if you moved into a compact residential neighborhood and subsequently your view across the street was of a significantly higher industrial-looking apparatus. Technology changes: perhaps lighter array structures would allow for taller devices that a roof could support. Please reintroduce the 5-foot-above-the-ridge-line height limit.

Freestanding Solar Energy System – A ground-mounted solar energy system, including a stationary or tracking system (either single axis or dual axis). An enterprise solar energy system that is installed on a carport is considered a freestanding solar energy system.

Single-Family or Duplex Residential Solar Energy System – An accessory use that is designed to provide energy for the principal use.

Multiunit Residential or Nonresidential Solar Energy System – An accessory use that is designed to provide energy for the principal use.

MOWER COMMENT: First, the zoning ordinance continues to use both the word MULTIUNIT (without hyphen) and MULTI-UNIT (with hyphen, e.g., “RESIDENCE, MULTI-UNIT”) and should be standardized in the main document. Second, the above definition makes no sense whatsoever, since it is identical to the above definition. Why not use the definition that is found later, under the standards, i.e. R(5):

5. Multiunit or Nonresidential Solar Energy System – An accessory use that serves all uses other than single-family or duplex residences – multiunit developments, commercial uses, other nonresidential uses, mixed uses, and shared systems, including systems serving residential subdivisions.

Enterprise Solar Energy System – A principal use designed to generate energy for use off site. This may also be referred to as a “utility-scale energy system” and is typically used for commercial purposes.

Shared Solar Energy System – A solar energy system that serves houses and/or developments situated on two or more separate lots. The system is considered accessory to the uses on each of the lots that it serves.

Utility-scale Solar Energy System – A principal use designed to generate energy for use off site. This may also be referred to as an “enterprise solar energy system” and is typically used for commercial purposes.

➤ ***Add the following new definition for “Carport.”***

CARPORT – A roofed structure for parking motor vehicles that is open on at least two sides. A carport may be a freestanding structure or attached to a building.

❖ *Modify the Table of Uses as follows:*

*Add the new uses below in the Table of Uses in Section 175-53 under Subsection VI. Utility & Transportation Uses at the end after Personal Wireless Services Facility:*

CATEGORY OF USES	RESIDENTIAL ZONES				COMMERCIAL CORE ZONES				RESEARCH-INDUSTRY ZONES				
	Rural (R)	Residence A (RA)	Residence B (RB)	Residence C (RC)	Central Business (CB)	Professional Office (PO)	Church Hill (CH)	Courthouse (C)	Coe's Corner (CC)	Office Research - Route 108 (OR)	Mixed Use and Office Research (MUDOR)	Office Research Light Industry (ORLI)	Durham Business Park (DBP)
<b>VI. UTILITY &amp; TRANSPORTATION USES</b>													
Single family or duplex residential solar energy system (accessory use) (See Article XX)	P	P	P	P	P	P	P	P	P	P	P	P	P
Multiunit residential or nonresidential solar energy system (accessory use) (See Article XX)	P	P	P	P	P	P	P	P	P	P	P	P	P
• Roof- or building-mounted	SE	SE	SE	SE	SE	P	P	P	P	P	P	P	P
• Freestanding													
Enterprise solar energy system (principal use) (See Article XX)	P	X	X	P	P	P	P	P	P	P	P	P	P
• Roof- or building-mounted	CU	X	X	CU	X	X	X	X	CU	CU	CU	CU	CU
• Freestanding													

❖ *Modify the Wetland Conservation Overlay District and Shoreland Preservation Overlay District as follows:*

➤ *Add the following use at the end of Section 175-60. Permitted Uses in the WCOD A.:*

8. Roof- or building-mounted solar energy system.

➤ *Add the following use at the end of Section 175-71. Permitted Uses in the SPOD A.:*

9. Roof- or building-mounted solar energy system.

➤ *Add the following use at the end of Section 175-61. Conditional Uses in the WCOD:*

7. Freestanding solar energy system.

➤ *Add the following use at the end of Section 175-72. Conditional Uses in the SPOD:*

6. Freestanding solar energy system.

❖ *Add the following as a new section in Article XX – Standards for Specific Uses, Section 175-109, and reletter R. Temporary Sawmill (including the table shown at the end).*

R. **Solar Energy Systems.** Solar energy systems shall be allowed in conformance with the following standards and procedures (See Definitions for solar energy systems).

1. **Authority.** This ordinance is adopted pursuant to RSAs 362-F, 374-G, 477:49, 672:1 III-a, and 674:17 (I)(j).
2. **Purpose.** The purpose of this ordinance is to:
  - a. encourage the implementation of solar energy systems in accordance with the recommendations stated in the Energy Chapter of the 2015 Durham Master Plan;
  - b. promote environmental sustainability while respecting the aesthetics and the landscape of Durham and the use of productive agricultural lands; and
  - c. comply with and support the State of New Hampshire’s goal of developing clean, safe, renewable energy resources as provided for in the statutes referred to in 1., above.
3. **Applicability.** Solar installations that use less than one kilowatt and are not connected to the electrical grid are not covered by this ordinance, though they may be subject to other specific regulations.

4. **Single-Family or Duplex Residential Solar Energy System (accessory use).**
  - a. **Basic requirements.** This accessory use serves single-family or duplex residences situated on the same lot. Both roof- or building-mounted and freestanding systems are a permitted accessory use in all zoning districts. Only a building permit is required (except under c. below).
  - b. **Placement.** For a freestanding solar energy system, no part of the system may be placed closer to the front property line (and side property line in the case of a corner lot) than the fully enclosed part of the house closest to the street. In addition, for a freestanding solar energy system that exceeds 10 feet in height (any part of the system), no part of the system may be placed closer to the front property line (and side property line in the case of a corner lot) than the fully enclosed part of the house furthest from the street.
  - c. **Special Exception.** A proposed system that does not conform with b. above, may be approved by a special exception provided it is not practical to place the system as specified in b., above (See Section 175-26 Special Exceptions).
  
5. **Multiunit or Nonresidential Solar Energy System (accessory use).** This accessory use serves all uses other than single-family or duplex residences – multiunit developments, commercial uses, other nonresidential uses, mixed uses, and shared systems, including systems serving residential subdivisions.

A roof- or building-mounted system is a permitted accessory use in all zoning districts. Only a building permit is required.

The following standards and procedures apply to freestanding multiunit residential or nonresidential systems.

- a. Site plan review with the Planning Board is required.
- b. The maximum allowed rated nameplate capacity for the system is the capacity that is needed to serve the estimated annual on-site requirements of the property.
- c. No part of the system may be placed closer to the front property line (and side property line in the case of a corner lot) than the part of the fully enclosed principal building closest to the street. In addition, for a system that exceeds 10 feet in height (any part of the system), no part of the system may be placed closer to the front property line (and side property line in the case of a corner lot) than the fully enclosed part of the principal building furthest from the street.

MOWER COMMENT: See Mary Downes' suggestions. In addition: She raises an excellent point about defining "principal building." The ZO includes a definition for "principal use" but not "principal building" or "principal structure."

- d. In cases where there is no building or no distinct principal building on the lot or where there are multiple lots, the system shall be set back at least 100 feet from the front property line and buffered from the road.
  - e. A proposed system that does not conform with c. or d., above, may be approved by a special exception (separate from the special exception if one is needed for the accessory use) provided: 1) it is not practical to place the system as specified in c. or d., above; and 2) the system is screened from the road and from neighbors in accordance with a plan submitted by the applicant and approved by the Planning Board.
  - f. The Planning Board may require an analysis of potential glare at its discretion. [MOWER COMMENT: language should be identical here and in 6b. below]
6. **Enterprise Solar Energy System (principal use)**. This designation refers to a system that is designed to provide electricity to uses off site. The following standards and procedures apply to enterprise solar energy systems.
- a. Site plan review is required for all systems, including roof- or building-mounted systems.
  - b. The system shall be set back no less than 100 feet from the front property line.  
The system shall be buffered from neighboring roads and properties in accordance with the Site Plan Regulations and as reasonably determined by the Planning Board.  
MOWER COMMENT: Without visual representation (or other empirical data), it is hard to evaluate the 100 feet. That said, a 100 foot setback is a surprisingly short distance for tall or massive structure, so I would argue that you keep this language: an applicant has the right to seek a variance.
  - b. The applicant shall submit an analysis about potential glare at the Planning Board's request. [MOWER COMMENT: See comment on 5b. above]
  - d. Where a solar energy system is allowed by conditional use, the conditional use permit shall be granted only if the Planning Board determines that: a) the proposal conforms to the general conditional use criteria contained in Article VII; and b) the location, topography, site conditions, design, and proposed screening for the proposed project are such that it will not be prominently visible from any designated scenic road (Bay Road, Bennett Road, Durham Point Road, Mast Road, or Packers Falls Road) or scenic viewshed, as specified in the 2000 Master Plan.  
[MOWER COMMENT: It is conceivable that other roads may be designated as scenic roads in the future, and the use of the word "scenic"

links the regulation to the rationale: viewsheds specified in the Master Plan include for the Mill Pond Center along Route 108, our gateway. Also, the Master Plan chapter "Vision and Community Chapter," adopted on November 18, 2015, includes this statement: "...Residents noted scenic views along the Oyster and Lamprey Rivers, College Woods, Mill Pond, Adams Point, Wagon Hill and more." NOTE: Enterprise systems are commercial and may in fact not benefit any Durham property owner or municipal function.]

7. **Other provisions.** The following additional provisions apply to all solar energy systems.
- a. **Building permit.** A building permit is required for the installation of any system.
  - b. **Setbacks.** Every part of a freestanding system, including components elevated above the ground and moving components, shall conform to required setbacks for the zoning district.
  - c. **Maximum Height.** For roof- or building-mounted systems located in any of the four residential zoning districts, the maximum height for any part of the system is ten feet above the ridge of the roof or ten feet above the highest part of the roof where there is no ridge. For roof- or building-mounted systems not located in one of the residential zoning districts, there is no height limit. The maximum height for freestanding systems is 25 feet.
  - d. **Impervious surface.** The maximum impervious surface ratio in the Table of Dimensions does not apply to solar energy systems.
  - e. **Submission requirements.** Applicants for projects that require a site plan shall submit all pertinent information, including specifications for the equipment, to the Planning Board, as specified in the Site Plan Regulations. Applicants for a special exception shall submit plans showing all pertinent aspects of the project and all elements specified by the Zoning Board of Adjustment.
  - f. **Decommissioning.** Applicants for freestanding Multiunit Residential or Nonresidential Solar Energy System and freestanding Enterprise Solar Energy Systems shall submit a plan as part of site plan review for the removal of the structures and reclamation of the site when the system is no longer in use.
  - g. **Historic District.** Additional procedures and standards for proposed solar energy systems located within the Durham Historic District are contained in Article XVII of this ordinance.



- h. Review process. The process for review of proposed solar energy systems is specified in Table 175-109 R below. In case of any conflict between this table and the text of the ordinance or the Table of Uses, the text of the ordinance and the Table of Uses shall prevail.
- i. Solar easements. Private property owners may establish solar skyspace easements to preserve access to solar energy at their option pursuant to RSAs 477:49, 50, and 51.

MOWER COMMENT: In the past I have objected to the use of non-legal words such as “encourage” in our land use regulations, but it may be worth considering the inclusion of language such as the following two (2) notes:

Owners of solar energy systems are encouraged but not required to obtain solar access easements from neighboring landowners to ensure solar access. The municipality does not guarantee and will not protect any individual property rights with respect to solar access.

When an applicant owns two or more adjacent lots, and at least one of those lots is proposed to utilize solar energy collection devices, the applicant is requested to consider establishing a solar access easement or a similar legal mechanism to make sure that structures or vegetation on one lot does not unreasonably obstruct solar access for the solar energy collection devices in the adjacent lot.

(source: Renewable Energy Ordinance Framework: Solar PV”  
<[https://www.dvrpc.org/energyclimate/ModelOrdinance/solar/pdf/2016\\_DVRPC\\_Solar\\_REOF\\_Reformatted\\_Final.pdf](https://www.dvrpc.org/energyclimate/ModelOrdinance/solar/pdf/2016_DVRPC_Solar_REOF_Reformatted_Final.pdf)>

**TABLE 175-109 R - REVIEW PROCESS FOR SOLAR ENERGY SYSTEMS**

<i>Type of use</i>	<i>Roof- or Building-mounted</i>	<i>Freestanding</i>
Single family or duplex residential system (accessory use)	Permitted as accessory use to any single family or duplex residence  Building permit only	Permitted as accessory use to any single family or duplex residence  Building permit only  Special exception if system does not meet placement requirement
Multiunit residential or nonresidential system (accessory use) including shared systems	Permitted in all zones  Building permit only	Permitted in all commercial core and research-industry zones (except for Central Business District, below)  Special exception in CB, R, RA, RB, and RC zones  Site plan review
Enterprise solar system (principal use)	Permitted use in R, RC, and all Commercial Core and Research-Industry zones  Site plan review	Conditional use in R, RC, all Commercial Core zones except for CB, and all Research-Industry zones  Site plan review

easements, in concurrence with the recommendations in Chapter 8 – Tax Stabilization.

4. The Wastewater Treatment Plant should be landscaped to enhance views from the river, which the plant has degraded.

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**Table 4.1. VIEWSHEDS IN DURHAM**

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*Newmarket Road*

Views of the Oyster River  
 View of the Bedard Farm  
 View toward Mill Pond Center  
 Views of the Cutter Farm  
 Views of the LaRoche Farm  
 Views of the Lamprey River

*Bennett Road*

Views of the LaRoche Farm  
 Views of the Lamprey River  
 Views of the Highland Farm

*Route 4*

Views of Johnson Creek  
 Views of Bunker Creek  
 Views of Emery Farm Fields  
 Views at Cedar Point /Back River Roads  
 Durham Business Park  
 Views from Scammell Bridge  
 Views of Wagon Hill Farm

*Mill Pond Road*

View of Mill Pond

*Durham Point Road*

View at Horsehide Brook  
 View across from Colony Cove Road  
 North side of “Crombie Curve”  
 Views at Crommet Creek

*Bay Road*

View toward the Bay at 540 Bay Rd.

*Packers Falls Road*

Views of Thompson Farm  
 N. side of Wiswall Rd.

*Mill and Packers Falls Road*

Fogg Farm

*Mast Road*

Views of Tecce Farm  
 Views of UNH Farm Fields

*Back River Road*

Views toward Bellamy River

*Dover Road*

Views of Beards Creek/Oyster Rvr.

*Old Landing Road*

View of Oyster River

*Main Street*

View of UNH horse barns  
 View of College Brook

*Adams Point Road*

View of Bay

*Langley Road*

Views to the north and south

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**LANDS IDENTIFIED FOR  
 CONSERVATION/GREENWAYS**

