

**SOLAR ENERGY SYSTEMS**  
**DRAFT ORDINANCE - Durham, New Hampshire**  
**Presented to Planning Board for Public Hearing on April 25, 2018**

*\*Incorporating specific comments from the public about specific provisions in the draft\**

**Comments from the public related to specific provisions in the draft are shown in this manner.**

All comments are inserted in what appears to be the most appropriate location after specific provisions of the draft ordinance. Some comments may apply to more than one section, however. No names are attached to comments. This symbol ----- is inserted between comments by different people. This document includes emails, letters, and verbal comments made at the public hearing. ***I tried to include those comments that are specific but, of course, there is a wide range of interpretations for what would fit that description, and readers may have different opinions about what should and should not have been included. Where there was some uncertainty, I erred on the side of including the comment.*** Within any section, comments are not placed in any particular order. Comments that did not fit into a particular location are included at the end. Pertinent portions of written comments are included largely verbatim. Verbal comments are roughly transcribed and are not verbatim.

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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, whether direct, diffuse, or reflected, received from the sun at wavelengths suitable for conversion into thermal, chemical, or electrical energy.

**Delete (i.e. not allow) “chemical” energy from solar energy definition and from solar energy system definition – keep only thermal and electrical. This is because most chemical energy systems are likely to have higher environmental risks from accidental leakage (such systems may be water based, but may also be based on the use of molten salts, or benzene, etc.).**

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**This is a general term that refers to widely different solar energy conversion technologies, including that related to solar hot water system (i.e., conversion to thermal energy), photoelectrochemical cells (i.e., conversion to chemical energy), and photovoltaic cells (i.e., conversion to electrical energy).**

**However, it appears that the term “Solar Energy System” as used throughout the proposed ordinance is referring strictly to photovoltaic cell technology, as for instance in the proposed**

changes to Article XX where the maximum allowed rated nameplate capacity is given as 30 kiloWatts DC and, more explicitly, in the corresponding footnote #1 which refers to the size of photovoltaic systems. That is, it does not address the permissible “size” of solar hot water systems which may also be roof mounted or free standing.

To remedy the inconsistency, one either needs to replace the term “Solar Energy System” throughout the document with the technology-specific term “Solar Photovoltaic System” (though this would eliminate any reference to the commonly used solar hot water systems); or, one needs to specify the size of the “Solar Energy System” in perhaps geometric terms, like the surface area of the proposed structure; or, come up with a different metric for sizing each type of “Solar Energy System.”

Lastly, it is my impression (through a quick google search) that the inclusion of solar to chemical energy conversion technology (i.e., photoelectrochemical cells) within the generic term “Solar Energy System” may be premature in that it appears that the technology is still in its developmental stages and it’s not clear (to me) what such a system would involve.

Solar Energy System – A structure and the related components used to transform solar energy into thermal, chemical, or electrical 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 using sunlight for such purposes as space heating and cooling, heating domestic hot water and heating pool water.

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 15 feet. The system may include limited accessory equipment that is ground mounted.

Freestanding Solar Energy System – A ground-mounted solar energy system, which includes: a) a stationary or tracking system; and b) a system mounted on top of a freestanding car port over a parking lot.

**The words “a system mounted on top of free standing car port over a parking lot” as used in definition of Free standing system -- are unclear. What does it mean and are we sure we know what this will allow?**

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**The definition of Freestanding Solar Energy System uses an "and" which implies both a) and b) are required. Should this be an "or"? Will all Freestanding systems require a car port and tracking 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.

Enterprise Solar Energy System – A principal use designed to generate energy for use off site.

Shared Solar Energy System – A solar energy system that serves houses and/or developments situated on two or more separate lots, which are not necessarily contiguous. The system is considered accessory to the uses on each of the lots that it serves.

Rated Nameplate Capacity – Maximum rated direct current (DC) output of a solar collection system based on the combined capacity of the solar modules present in the system.

DC – Direct current (unidirectional flow of electrical charge).

➤ *Delete existing text that is crossed out here under “Building Height.”*

BUILDING HEIGHT – The vertical distance from the mean grade elevation (average grade around the perimeter of the building) to the mean roof elevation. For sloped roofs this is equal to one-half (1/2) of the vertical distance from eave to ridge. For flat roofs, including those with parapets, this is measured to the surface of the roof. Approved roof-mounted appurtenances such as ~~solar arrays~~, utilities, and telecommunications structures are not considered part of the “building height.”

❖ *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)													
• Roof- or building-mounted	P	P	P	P	P	P	P	P	P	P	P	P	P
• Freestanding	SE	SE	SE	SE	SE	P	P	P	P	P	P	P	P
Enterprise solar energy system (principal use) (See Article XX)													
• Roof- or building-mounted	P	X	X	X	P	P	P	P	P	P	P	P	P
• Freestanding	SE	X	X	X	X	SE	SE	SE	SE	P	P	P	P

**COMMENTS PERTINENT TO THE TABLE OF USES, ABOVE:**

We urge you to review every aspect of the proposed ordinance, visualizing the actual impact on Durham’s pastoral viewsapes no matter what zone they fall within and with consideration to permitted scale and height. Because one size does not fit all when it comes to placement of freestanding solar systems on individual Durham properties, we urge you to replace the “P”s (Permitted by Right) with “SE”s (Special Exception) unless in backyards or behind buildings. This would allow for each unique situation to be reviewed individually by the Zoning Board and with the benefit of a community conversation.

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Placement Within View Along Gateways. Over the decades, Durham has worked hard to protect our gateways. Unlike many other NH communities, we have not permitted commercial sprawl along our gateways. Discussions about protecting our rural character, as seen from our gateways, has been part of every Master Plan conversation and came across very clearly in last year’s Future Land Use Master Plan Forum as something we all agreed upon.

Interestingly, parts of many of our Gateways are also are zoned commercial. Take Mast Road, (Rt. 155A) for instance. The portion that remains undeveloped is one of Durham’s pastoral entryways into town, with this gateway bordered by expansive fields on both sides of the road. A large freestanding system, whether Multiunit, Nonresidential, or Enterprise, is permitted with *500 kw or greater system placed along a rural gateway*. If in the Rural Zone, by SE, but if in one of our Commercial Gateway Zones Permitted by Right. This is not right! Again, since one size does not fit all, these systems should all be permitted by Special Exception, not permitted by right as is currently the case.

In order to meet the Purpose statement of the Solar Ordinance, any large freestanding system along a Gateway or Designated Scenic Road should be permitted by Special Exception and require extensive screening from the road and neighboring properties.

Special Exception for all freestanding systems will allow for a case by case review, a set of objective criteria, and a chance for a public conversation. All freestanding systems should be permitted by Special Exception only. This is critical given sentiments expressed by at the Future Land Use Forum.

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I support the suggested requirement to have solar permitted by Special Exception. Requiring a zoning board review for each site would ensure that these are not placed where they have a detrimental effect on scenic views, land values or the environment.

I also have an additional concern about the increased use and placement of solar. I work as an urban forester for a government agency, and provide assistance to communities in The New England States and New York. We are seeing more and more cases where large yard trees are

being removed to provide full sun exposure for solar panels. (I recall a permit that came before the Durham Conservation Commission requesting to remove trees in a wetland setback, in order to accommodate solar panels). In some cases the Companies that work with solar, aggressively promote the removal of trees to increase their output. This can become a contentious issue, especially in cases where the tree is on a neighbor's property, and existed decades before the solar panel.

...I feel a Solar ordinance should include language to balance the use of solar with the protection of trees, and hope that you will consider adding this language to the ordinance.

❖ *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).

Durham's ordinance should assert that its Solar Ordinance is "reasonable" by our community standards. The term "unreasonable" as used in the RSA should not be interpreted to mean all limits are unreasonable. We must be prepared to defend our interpretation of the vague term "unreasonable" as used in the statute to ensure viability of the ordinance.

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This is a quote from Cordell Johnston, attorney for the NH Municipal Association about RSA 672:1:

“The statute you cited is pretty general and subjective--clearly, it does leave room for the town to regulate solar arrays, as long as it does not do so unreasonably. There are no hard rules on what is and is not allowed--only a test of reasonableness.”

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Therefore, any regulation which discourages or unreasonably limits solar installation should be adopted with extreme care, and with an eye to encouraging alternative energy as much as possible. This gravity of this issue must transcend neighborhood disputes, which could be viewed as trivial in light of the importance of this existential global concern.

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I have read the material concerning the proposed ordinance to regulate placement of solar arrays. I am against this ordinance as written as it does not adhere to the law as written and referenced. RSA 672 states

III. Proper regulations enhance the public health, safety and general welfare and encourage the appropriate and wise use of land;

III-a. Proper regulations encourage energy efficient patterns of development, the use of solar energy, including adequate access to direct sunlight for solar energy uses, and the use of other renewable forms of energy, and energy conservation. Therefore, the installation of solar, wind, or other renewable energy systems or the building of structures that facilitate the collection of renewable energy shall not be unreasonably limited by use of municipal zoning powers or by the unreasonable interpretation of such powers except where necessary to protect the public health, safety, and welfare;

2. **Purpose.** The purpose of this ordinance is to:
  - a. encourage the transition to renewable energy sources in accordance with the recommendations stated in the Energy Chapter of the Durham Master Plan;

Insert “while maintaining Durham’s scenic vistas” after “renewable energy sources.”

- b. promote environmental sustainability while protecting the character of rural and scenic lands and the use of productive agricultural lands; and

Replace b. with “promote environmental sustainability while protecting the rural community character as seen from public roads;”

Add new c. “Minimize potential adverse impacts of solar energy systems in the community by ensuring that such facilities are properly screened and are properly sited within the existing

topographic features of the property.”

Add new d. “Ensure that safety and maintenance procedures are in place to protect the public health.”

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Many people are drawn to Durham because of the scenic quality and rural character that the town has made great efforts to preserve. Please recall that the facilitator of our Future Land Use Chapter Forum reported that this is one area where nearly all Durham residents agree. This is evidenced throughout our Master Plans over the years. That is why I was pleased to see in the Purpose statement [b, above]... Given how strongly Durham residents feel about protecting rural character and scenic vistas, I see this Purpose statement as being critical to crafting an ordinance that is balanced and accepted by the community.

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...We were pleased to see in the Purpose statement [b, above]. However, the proposed solar ordinance falls short of meeting this Purpose statement. We are particularly concerned about the actual visual impact of the proposed ordinance along our designated scenic roadways and our gateways, regardless of whether a freestanding solar system falls within our residential or commercial zones. From an aesthetic perspective, the use of freestanding solar systems should be evaluated, site by site, based on “what is seen from the road” vs. what zone it happens to be in. A freestanding solar array along Packers Falls Road in the Rural Zone diminishes the scenic, rural character just as much as a freestanding solar array along Mast Road (zoned ORLI), Rt. 4 (zoned both RC and DBP), or Rt. 108 (zoned RB).

- 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. **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). The maximum allowed rated nameplate capacity for a single-family or duplex residential solar energy system is 30 kilowatts (DC)<sup>1</sup>.

**Scale. I understand that single family use of solar energy falls between 5-8 kw. That is the equivalent of one or two sizeable solar trackers. So why are we permitting up to 30 kw? That is the equivalent of 5-6 trackers or 120 ground-mounted solar panels! This is totally inappropriate**

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<sup>1</sup> The size of solar photovoltaic systems is described in terms of installed power in kilowatts (DC), based on typical solar photovoltaic panel ratings and sizes being installed in 2018.



in the front yards (even 100 feet back from the road) or side yards of residential neighborhoods.

For single family/duplex use, we should allow a maximum of 10 kw, an amount nearly double the typical residential use.

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Solar arrays on roofs for the purpose of providing domestic use power are a reasonable exercise of private property rights and I support that right. Solar arrays populating portions of any site not affixed to the principal structure should conform to the use zone regulations.

- 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 part of the house closest to the street, provided, however, that the system need not be set back further than 100 feet from the front property line.

Front yard placement....[It] makes good sense to not allow freestanding solar systems in front yards, yet as you know, some front yards are hidden in the woods, or at the end of long private road, or in the back yard relative to the road. So it makes sense to use the vehicle of Special Exception to allow each request to be viewed by the Zoning Board on a case by case basis. But why throw in the caveat “that the system need not be set back further than 100 feet from the front property line”? On what basis was 100 feet deemed an appropriate distance? Do the drafters believe that a permitted 35-foot tall structure will not appear imposing or disrupt a scenic vista 100 feet from the road? One hundred feet is closer to the road than one would think.

I also want to point out that my next door neighbor’s property along our particular scenic stretch of Packers Falls Road is 185 or 190 feet deep. Thus because of this arbitrary caveat, under the current regulations, he could place a 35-foot tall tracker plunk in the middle of his front yard. Actually he could place 5 or 6 solar trackers in his front yard. This is barely an improvement from what occurred previously.

The 100-foot caveat must be removed as it does not meet the Purpose statement of the Ordinance.

Side Yard Placement. I understand the rationale that freestanding solar systems may be placed in side yards no further front than the front facing of the house. In theory, that would be less offensive to neighbors and passersby. Yet here again, one size does not fit all.

Along some of our historic/scenic roads, homes were built very close to the road. In the two mile stretch from my house on Packers Falls Road to Mill Road, along our Designated Scenic Road, there are 12 properties built fairly close to the road that have extensive side yards or

fields that extend along the road. (Two properties were actually built with a portion of the house in the road right-of-way.) Picture the property of former PB member Julian Smith. His house is perhaps 30 feet back from the road and had an extensive side yard and scenic vista to the point where he even built a scenic lookout at the edge of his side yard.

Based on the current language in the Ordinance, one could place 5 or 6 35-foot tall solar trackers in the side yard of a single family property or 120 ground-mounted panels along our historic/scenic road within close proximity to the road. Even if required to meet setbacks, our setback for a Collector Street is 30 feet. Here again, it would make more sense to have each property evaluated on a case by case basis for side yard placements as some side yards might be concealed by woods or at the end of a long private driveway.

In order to meet the Purpose statement, side yard placements for freestanding solar systems should be approved by Special Exception and should require extensive buffering.

Freestanding Solar Systems for Single-Family or Duplex Use should be permitted by Special Exemption in front and side yards. Delete 100-foot caveat which targets scenic vistas. Scale and height should be reduced to appropriate sizes and dimensions.

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Those scenic views do not all sit on our gateways, but those that do tell me, when returning from Portsmouth or Newmarket, or from Portland or Boston, or from longer trips, that I am coming home to, yes, a special place. I do not want to see those scenic vistas marred with large ground mounted industrial solar panels.

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A positive aspect in the draft, is that residential Free Standing System will not be allowed in the front yards. In addition to that we should also require that any residential Free Standing System shall be as unobtrusive for neighbors and passers-by as possible. (e.g. where possible have the FSS backed up against trees).

The draft allows for residential FSS to be placed in most of our zones with no or minimal reviews beyond building permit. This ignores and puts low priority on any impacts on our natural landscapes. While the draft ordinance has some cursory references to our need to balance need for solar versus preserving Durham's rural character, in effect the proposal has no explicit practical way to limit impact on our rural settings. We should therefore either add requirements to meet some specific , thoughtful standards to limit impacts of residential FSS, or for the time being we should limit residential FSS to very few, may be only 1 or 2, zones.

To my eyes, a solar array, whether roof or ground-mounted, is a symbol of progress and concern for the environment that should be encouraged and admired. Committed early-adopters are now making the critical first investments in solar energy. In some cases (as in our own) municipalities and other large organizations have made major leadership investments in solar. It is very important that this trend continues without interruption to make solar arrays commonplace.

- 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). The Zoning Board of Adjustment may require an analysis of potential glare at its discretion.

Stationary arrays are typically much lower in profile than tracking arrays. The ordinance should acknowledge this and consideration should be given to the visual, neighborhood impact of one type of array vs. the other.

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There is no reason why the Planning Board cannot build into its support for solar energy systems the opportunity for community feedback when it is most needed by exercising tools specifically designed to do so, such as the Special Exception. This would not place an unreasonable burden on property owners. It simply reflects our social compact: living in a community brings with it obligations to our neighbors.

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The dust-up from the installation of a free standing array on Packers Falls Road has little to do with these criteria, it is a matter of taste and with this ordinance Durham will be forcing a land owner to comply to the “likes” of whoever does not like the looking at something on the owners property. I can understand the objections, but there are no health, safety or welfare concerns. My objections to the passage of the ordinance as written is it will not, as the chair of the energy committee states -“notify abutters in advance, and protect the large investment of the homeowner from becoming a source of legal or neighborhood strife, as much as possible.” but rather create a legal battle for the town and we will probably lose, resulting in extra legal fees for the Town and if the owner pursues it, reimbursement of their legal fees (I reference the Sprint Tower as an example). As well, there is no logic in such an ordinance; are we to also prevent placement of swings, pools, horseshoe pits etc. on the road side of a lot because someone does not like to look at them?

I would suggest a solution that does not require a special exception, but like all appliance installations, a permitting process that can come before the board and then on a case by case basis be decided using criteria allowed in the existing statute, RSA 674 part I:

I. Every zoning ordinance shall be made with reasonable consideration to, among other things, the character of the area involved and its peculiar suitability for particular uses, as well as with a view to conserving the value of buildings and encouraging the most appropriate use of land throughout the municipality.

For the array in question, it could have been a civil discussion with the Planning Board about location and not the unnecessary added burden of a special exception with flies in the face of RSA 672.

4. **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.

**Shared solar systems should not be permitted unless by special exception. Such systems are likely to have complex layouts that need to be reviewed and approved. Further, allowing one megawatt size as proposed seems excessive -- the allowable size should be site specific, with some sites justifying only much smaller sizes.**

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 500 kilowatts (DC).

**The Town must clearly envision what a 500 kW array would look like in terms of area and height. (See proposed Section 4, para. b.)**

**Most residential applications would require, roughly, a 10 kW array. 500 kW may be excessive. Space and setback restrictions for such an installation must be evaluated on a case by case basis and not allowed by “right”. The term “Special Exception” should be applied and used as intended in Section 175-26.**

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**For shared systems in residential neighborhoods, the permitted amount is 500 kw by SE. This translates to 80 trackers or 2000 ground-mounted panels! Along Newmarket Road, the town spent \$140,000 to protect the Mill Pond Center scenic vista. On the adjacent property, also part of the scenic vista, there is narrow swath of land that is a separate lot of record that was recently purchased by the Mill Pond Center. With a lot line adjustment, this ordinance as**

**written would permit up to 80 trackers or 2000 ground-mounted panels by Special Exception only 40 feet from the road and with required buffering only “partially and periodically.”**

- 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 principal building closest to the street.
  - 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 30 feet from the front property line and buffered from the road.
  - e. A proposed system that does not conform with c., 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., 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.
5. **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.

**Enterprise solar systems should not be permitted any where in Durham. Such systems are likely to have complex layout and intensive use of land (clear cutting trees, etc.). Further, allowing any size as proposed is irrational -- Huge sized systems may be appropriate in "desert-like" settings (e.g. in Nevada), but clearly would be egregiously damaging to Durham's natural landscapes. Do we really want a "Onassis-refinery-like" solar monstrosity in Durham as allowed in current draft? I would suggest not.**

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**An array that has the capacity to generate marketable power is an industrial use and should be tested by an approval process that balances preservation of uses permitted in the zone. By example a large visible array has the potential of diminishing property values. I sight the failure of Northern Pass to gain approval for this very reason. If the PB finds some level of solar use outside commercial and industrial zones appropriate there as a minimum should be strict vegetation barrier screening protecting the environment nearby from visual pollution from a non-conforming structure.**

- a. Site plan review is required for all systems, including roof- or building-mounted systems.

- b. Systems of any size are allowed.

**Proposed Section 5, Paragraph b. “Systems of any size are allowed”**

This is an unreasonable open door for potential opportunism. At this stage the Town should hold on to its right to review such applications rather than allow “any size” “Enterprise” installation by “right”.

Taxability is not addressed with respect to “Enterprise” systems. Currently, at Code Section 132-7, B, we find: “A property owner of a building equipped with a solar energy system shall receive a real property tax exemption equal to the cost of the solar energy system in that building.”

A non-taxable “Enterprise” installation is not in the Town’s best interest. It is essential this issue be addressed.

- c. 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.

**Placement in Undeveloped Fields Along Designated Scenic Roads**

According to this current draft, the scenic meadow next to my house along a Designated Scenic Road qualifies for an Enterprise System by Special Exception. There are no limits to how many trackers or ground-mounted panels are allowed within 30 feet from the road! This is unreasonable in a residential neighborhood unless *completely screened* from the road and neighboring properties.

While buffering is required for a Shared System or Enterprise system, the current definition of this term falls short in terms of protecting scenic vistas:

**BUFFERING** – The use of landscaping (other than grass on flat terrain), or the use of landscaping along with berms, walls or decorative fences that at least partially and periodically obstructs the view (emphasis added).

This definition needs to be strengthened. I look to our neighbors in Hampton who have had a solar ordinance in place since 2009 and who define buffering as “fully screened.” (By the way, Hampton does not allow freestanding systems in front yards at all. If placed in side or back yards, freestanding systems shall be no more than 8 feet above the ground and fully screened from adjacent properties.)

If approved by SE, freestanding Multiunit, Nonresidential, Shared or Enterprise Systems should require extensive, complete screening from the road and neighboring properties.

Special Exception does not provide adequate protections when it comes to large systems that will significantly impact our gateways, Designated Scenic Roads, or abutting neighbors. Our language around required buffers needs to be beefed up.

A definition of buffering should be included in the Ordinance and should include language such as “fully screened” rather than the existing ZO “partially and periodically.” Language about buffers should be included in all 3 uses, not just large systems as even one tracker can be offensive in a residential neighborhood if not adequately screened.

- d. The applicant shall submit an analysis about potential glare and other potential nuisances caused by the installation.

Solar energy is an evolving technology and we should not allow ourselves to be vulnerable to unintended consequences related to “Enterprise” development that may be incompatible with our community. “Enterprise” development may be premature at this time. If it is to be allowed, however, it must, at a minimum, be by “Special Exception” only (175-26) so that “...the use will not be detrimental to the character or enjoyment of the neighborhood by reason of undue variation from the kind and nature of other uses in the vicinity or by reason of obvious and adverse violation of the character or appearance of the neighborhood.”

Consider requiring a carbon off-set evaluation by applicants. That is to ensure that the CO<sub>2</sub> emissions reduction resulting from an “enterprise” installation is greater than the loss of CO<sub>2</sub> consumption resulting from potential loss of vegetation in the “enterprise” area.

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I have heard some of the Board's discussion, re: solar arrays and farming. Solar arrays are very often compatible with agriculture, particularly with grazing animals. And till agriculture can often be worked in, depending on the actual placement of the solar collectors. One sees many such combinations across Vermont, among other places. And Councilor Tobias is correct that solar energy can provide an important extra source of income to a farmer from having or hosting such solar arrays. I suggest you might wish to discuss this with Theresa Walker, our AgCom Chair.

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We should also keep in mind the underground power lines leading to and from the arrays which would preventing tilling of soil in these areas.

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I spent a few years managing our telephone operations in the Midwest and we routinely plowed cable through some of our country's most productive farm land. We paid harvest price for the crops we had to destroy and guaranteed to repair any drainage tile we damaged as well as bury the cable below the plow/till level. Where there is a will there is a way – so underground powerlines do not need to prevent tilling if you are willing to pay the price and bury them deep enough. Additionally, much of the Midwest has migrated to no-till farming to reduce soil compaction and soil erosion.

6. **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. This requirement, however, does not apply to the lines and components that connect the system with the grid and to the lines crossing lot boundaries for shared solar energy systems.
  - 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 as specified for building heights in the Table of Dimensions.

**Comment to the effect that the ten foot height restriction above the roof may be too restrictive as the person has tall trees that would block sunlight from reaching such a structure.**

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**We also believe that height and setback regulations should be revisited, again with an eye for how such a system will appear from the road.**

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**Setbacks and Height. Setbacks are determined by street classification. Arterial Streets, otherwise known as our Gateways (Mast Road, Rt. 155A, Rt. 155, Rt. 4, Rt. 108, and Madbury Road—as noted in the definition section of our ZO) run through various zones and have different setback requirements. ORLI (Mast Road) and Durham Business Park (Rt. 4) have only a 50-foot setback. Permitted heights for these districts are 40-50 feet. Does it really make sense to allow 40-50-foot tall trackers only 50 feet back from these scenic Gateways?**



**I would like to point out that in OR-108, freestanding systems are allowed to be 50-75 feet tall with Planning Board approval! Even if only 50 feet is approved, that is the height of 9-11 Madbury Road, this makes no sense.**

**Rather than fall back on existing height limits of buildings in each of our zones, we should establish reasonable limits that actually can be screened from the road.**

**Larger systems for shared, multiunit or commercial use should be revisited for reasonable scale, height and setback criteria.**

- 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. Proposed solar energy systems within the Durham Historic District are regulated under Article XVII of this ordinance.
- h. Nuisance. Should any solar energy system become a nuisance by virtue of glare or other impacts, as determined by the Zoning Administrator, the property owner shall mitigate the impacts as appropriate.

**Concentrating solar power systems, which often use sunlight reflecting mirrors, should not be allowed in any kind of solar system in any setting in Durham. This issue is unaddressed in the draft.**

- i. 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.
- j. 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.

Consider that many types of equipment and tools are designed to use electrical hookup. An irrigation system that may not be located inside a building could use a small solar array to charge a battery system that powers the pumps instead of utilizing the greater electrical grid. The UNH farm in Barrington uses solar to power the weather station in the center of the field. We need to be thinking about how commerce and agriculture will work in the future, not how it was done in the last century.

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I called the planner from the Town of Hampton to see what they have done. Their ordinance is from 2009. You may be shocked at what they have done. They said there should be no ground mounted facilities over two square feet in the front yard. In a side or rear yard it has to be fully screened. No panels anywhere can be higher than eight feet tall. That is what they consider reasonable...the back side of an array has a very different look than the front of one. It looks very industrial. How are we going to look at solar easements? If the easement says the abutter cannot put in anything that will block the sun, how will this affect a subsequent land owner?...We must talk about site specific situations. We need to have the flexibility to make sure the installation will work in that particular location...I don't think there are good uses and bad uses but rather uses that are in the right locations and in the wrong locations.

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Here to talk about the impact particularly of freestanding units whether in industrial, commercial, or residential...request that freestanding units, particularly if visible from the road consider installing buffers. As far as the solar tracking unit, I don't feel that it is incongruent with vistas and if approved it could be behind the home or buildings because I have not figured out a way to screen a 25 foot array without destroying its ability to receive sun.

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The Master Plan for Durham is very strong on the importance of renewable energy of the Master Plan. It will be very difficult to attain self reliance or 100% renewable that the Energy Committee has talked about moving toward, and I worry that with a restrictive ordinance it simply will not be possible. We can't simply put solar on rooftops and get there...We will need utility scale energy production [referring to Northern Pass and Seacoast Reliability] if we don't promote renewable energy...Very concerned about aesthetics but there is a little bit of an either or dichotomy that is being set up here that is probably not appropriate. You can still have ground mounted solar and still preserve the aesthetics of the community.

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What I kept hearing over and over again is that people are looking for a win-win situation. People here are for solar energy and want to see more of it. People in the room also want our

scenic Durham to stay scenic and naturally beautiful and unobstructed by things that would take away from that and could be placed in a different place...I thought about what could be placed on our scenic roads and jeopardize them. I thought of the large solar trackers...If a tracker cannot be set back from a house it can be placed 100 feet from the road, and I got a visual of traveling down one of our roads and seeing a few solar trackers there. It could have a large impact. It would change the way our roads look...I want to underline the idea that one size does not fit all. Setting back trackers 100 feet will not take care of protecting scenic vistas.

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I am recognizing the difference between opinions and facts. Most of us think that our opinions are facts. I was a little troubled tonight by terms such as visual pollution, reasonableness, detrimental view. Those are all opinions but people may be looking at them as facts...I happen to believe that solar installations are beautiful...I think that my ability to put photovoltaic panels mounted on the ground on my property at my financial expense is a right and also for me a joy, to vote with my dollars to vote for a future moving from carbon. I am afraid from some of what I am hearing that I may be told that I cannot do this, that I may have to put up blinds that makes my investment less attractive...I would want to focus on balance. I would want any regulation which discourages or unreasonably limits solar to be looked at with extreme care. I think this town should not send a message like Hampton's. If there is an example of what Durham does not want to be about we do not want to send a message like that.

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Those of us who spoke before did not strongly enough distinguish between types of ground mounted solar systems from a visual perspective. That should be clarified in the ordinance. I think many would be aligned with promoting the low profile systems and are much more concerned about the more visually intrusive, tall, freestanding systems.

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I am delighted that I not yet have I heard anybody speak against solar power. I think everyone is in favor of it and what we are hear for tonight is to discuss the language of the ordinance and how it can be most effective in accomplishing our goals.

**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 and all Commercial Core and Research-Industry zones  Site plan review	Permitted in all Research-Industry zones  Special exception in R and all Commercial Core (except for CB) zones  Site plan review