

*A compilation of  
public comments  
on the SMART  
revisions prepared  
by eight members of  
Belchertown's Friends  
of the Pelham Hills*

Since the 2018 launch of the SMART program, Belchertown has reviewed 9 large-scale commercial solar installations, giving our town a particular knowledge and insight regarding the strengths and weaknesses of the program. Friends of the Pelham Hills offers the attached comments to help DOER shape a smarter 2020 SMART program; to solve its problems and advance its strengths. Our founding principle — that forests and reforestation are critical to the climate change solution — has brought together a collective which includes hydrologists, engineers, botanists, academics, town administrators and board members, professional environmentalists, and thoughtful residents, all concerned equally with the health of the globe and of Belchertown's own 35,000 acres.

Several of the individual letters attached to this message contain specific recommendations to help resolve a serious problem that we see in the existing SMART regulations, that is, a lack of reasonable guidelines that would limit the wholesale denudation of forested lands across the Commonwealth by the construction of large-scale commercial solar developments. There are also associated issues of the construction of these large solar arrays on prime agricultural land and on land that has steep slopes and thin soils, but it is the issue of the loss of large forested land, funded by publicly mandated expenditures from electric utilities, that is most important. We would point out that this situation is similar to the State's responsibility in providing minimum standards expected in the environmental protection of wetlands and storm-water control that makes creation of these minimum standards of protection of natural resources so necessary when the application of public funds are used as incentives to encourage the construction of large-scale commercial solar developments in Massachusetts. We sincerely hope that you include stronger and more focused mandates in the updated SMART regulations to eliminate the wholesale destruction of forested land for solar development in Massachusetts.

June 1, 2020

Department of Energy Resources  
100 Cambridge Street, Suite 1020  
Boston, Massachusetts 02114  
Attn: Ms. Kaitlin Kelly

**Subject:** SMART Public Comment on 225 CMR 20.00, and specifically the “Guideline Regarding Land Use, Siting, and Project Segmentation”

**Summary:** Forests are important for the sequestration of carbon, preservation of wildlife habitat, control of storm-water runoff and prevention of soil erosion, and a sustainable economic resource for central and western Massachusetts. The fundamental environmental principle to “do no harm” means that it makes no sense as Massachusetts State policy to publicly finance the destruction of forests for the construction of large-scale commercial solar arrays, nor create hazards to nearby property and public safety, to improve regional air quality or save the planet from excess carbon dioxide and global warming.

**Introduction:** The SMART program provides regulatory and financial support of solar power generation and is a real step forward to a more sustainable future. Many homeowners, including my wife and I, have taken advantage of the SREC incentives to produce solar power, and we support many of the goals of the SMART program. There are, however, serious environmental and safety issues related to the present approach to developing commercial solar arrays, particularly in the rural and semi-rural areas of central and western Massachusetts, and these issues need to be addressed in the updated SMART regulations.

My comments below reflect my experience as a professional hydrologist for over 40 years, working for the U.S. Geological Survey, as an instructor for numerous Colleges, Universities, and Professional Organizations, along with consulting for the private sector. The following comments are listed in numerical order.

1. The updated SMART regulations don’t include critical guidelines for the prevention of forest removal via site selection and design criteria for Large-Scale Commercial Solar Development (LSCSD) in Massachusetts.
2. Without strong and explicit guidelines in the SMART regulations for site selection and design criteria, there have been, and will continue to be, serious environmental failures and safety issues at LSCSDs in Massachusetts, particularly in the central and western regions of the State.
3. Examples of significant failures include, but are likely not limited to, LSCSDs in West Orange, Ware-West Brookfield, and Williamsburg, Massachusetts.

4. In the case of West Orange, it was reported in the news article (<https://www.atholdailynews.com/Inside-Outside-Sept-5-19950652>) that there was significant erosion, sediment transport, and destruction of adjacent property, including a cemetery, immediately after LSCSD construction had begun. The land clearance included the complete removal of all trees, stumps, brush, and other vegetative cover, leaving the ground bare at the LSCSD and open to severe erosion during a large rainfall event (see photograph below). This loss of soil and erosion led to significant environmental destruction that was both predictable and preventable.

5. In the case of the Ware-West Brookfield site, the LSCSD is on a steep slope with a very thin soil cover located near the junction of State Routes 32 and 9, close to the Ware River. Although fully developed, and presumably with all erosion control measures in place, surface and satellite photographs of areas at the perimeter clearly show large areas of erosion from uncontrolled storm-water runoff from the site (see photographs below).

6. The Williamsburg solar array, as reported by the Daily Hampshire Gazette (<https://www.gazettenet.com/Developer-of-Williamsburg-solar-project-sued-by-state-attorney-general-for-polluting-river-34123461>) was a poorly sited and designed LSCSD. After the site was developed, significant damage resulted from “The sedimentation of wetlands near the West Branch Mill River in Williamsburg” and “is the subject of a lawsuit by the state attorney general’s office against Dynamic Energy Solutions, LLC, a company that received approval to build a solar array off Briar Hill Road.” In addition, the Gazette article goes on to say “According to the lawsuit, the construction of the solar array on an 18.5-acre section of a 370-acre property, owned by Hull Forestlands Limited Partnership and spanning both Williamsburg and Goshen, led to altering 97,000 square feet of protected wetlands and more than 41,000 feet of riverfront area, covering the bottom of the river with the equivalent of more than an acre of sediment pollution.” (See photographs below). So, due to the lack of significant siting and design criteria in the SMART program regulations, the State of Massachusetts Department of Environmental Protection has had to step in and try to correct serious environmental damage that has occurred at this project.

7. From our own experience in Belchertown, our group (Friends of the Pelham Hills) has opposed a LSCSD proposed for development in our neighborhood of Belchertown. This proposed LSCSD was originally designed to involve the denudation of 50 acres of steeply-sloped forested area, adjacent to and in the drainage area of Scarborough Brook, a designated flood zone, a cold-water fishery and a contributing area for a drinking water aquifer. After strenuous opposition by our neighborhood group and 13 different versions of increasing more complex engineering designs, none of which were fully protective of the wetlands, other important environmental resources, or adjacent private properties, the Belchertown Conservation Commission and Planning Board refused to permit this poorly sited and badly designed LSCSD based on the flawed storm-water control plans for the site.

To give only one example of the design flaws in the engineering plans for the above project, a large “retention-detention” basin was proposed to control the storm-water runoff from most of the site. This detention basin was designed to contain millions of gallons of water at peak storm-water storage, and to have a retaining berm (i.e. dam) nearly 400 feet long and 16 feet high. The dam was designed to be located on the top of a very steep slope, 100 feet high, and only 500 feet from a permanent residence on an adjacent property. This storage basin, designed without any input from the MDCR Dam Safety Program, if constructed, would have been a serious threat to the personal safety and property of abutting residents, State Route 9, a major east-west railroad corridor, and local roads, all located immediately downstream of the proposed site.

The proponents of this project have appealed the Belchertown Planning Board’s decisions to Massachusetts Superior Court, and the Conservation Commission’s decision to the Massachusetts Department of Environmental Protection. The lack of State guidelines in the SMART regulations for proper site selection and project design for this LSCSD has now cost our group, and the Town of Belchertown, many thousands of dollars to defend our lives and properties from this project.

8. As demonstrated by the above examples, the inadequacy of the existing DOER SMART guidelines for LSCSDs is not a theoretical problem. The experiments on what can, and will, happen when poorly sited and designed LSCSDs are imposed on smaller towns in the State, where there is little expertise to evaluate the possible impacts of these projects by large corporate entities, has already happened. The smaller Towns in the Commonwealth have volunteer Boards, and these volunteers have had little or no experience in the effects of LSCSD in Central and Western parts of Massachusetts. These Towns also have very limited resources to defend permit denials if appealed by these corporate entities. Often these Corporations use arcane real estate laws to “tie up” these appeals, potentially dragging the proceedings out over years, and bleeding the financial resources of the Towns. Again, the lack of State guidelines in the SMART program for proper site and project design for LSCSDs is imposing a significant financial and environmental burden on our part of the State.

9. The key to the problems noted above is the lack of specific DOER guidelines and criteria to help preserve forest cover in the existing and updated SMART program to develop Large-Scale Solar Commercial arrays in Massachusetts. Forests are important for the sequestration of carbon, preservation of wildlife habitat, control of storm-water runoff and prevention of soil erosion, and maintaining a sustainable economic resource for central and western Massachusetts. To publicly finance the wholesale destruction of forests by developing poorly sited and inadequately designed large-scale commercial solar arrays makes no sense whatsoever as a public policy for Massachusetts.

10. Large-Scale Commercial Solar Developments aren’t agricultural projects in any way, shape, or form; LSCSDs are industrial-sized electrical generation facilities. As such, they impose

industrial-scale problems in rural areas. In addition to the environmental problems noted above, other problems include serious safety problems in the local electrical grid from the power surges that occur from the LSCSD arrays as the amount of electrical energy varies from clouds (changing weather) passing over the arrays. There have been anecdotal reports in our area of serious local electrical surges and brownouts at nearby homes as overloaded electrical systems try to compensate for these variations in power entering the local grid. It's also our understanding that National Grid, the electrical power distributor in our area, has put a "hold" on new commercial solar array connections until they complete a study of the ability of the existing electrical grid to absorb new generating capacity, and are making recommendations on what new infrastructure is necessary to insure the safety and reliability of the system with additional LSCSD installations. To encourage the development of commercial solar arrays in agricultural or rural-residential areas without adequate electrical grid infrastructure to handle the added power load is very poor public policy.

11. In order to deal with the environmental and safety issues noted above, additional ineligible land uses need to be added to the SMART regulations, specifically: **SOLAR MASSACHUSETTS RENEWABLE TARGET PROGRAM** (225 CMR 20.00), "Guideline Regarding Land Use, Siting, and Project Segmentation". An example of language suggested for the guideline that would help control and prevent the wholesale removal of forest as part of large-scale commercial solar developments, and the problems with the imposition of industrial-sized solar power developments in rural-residential areas, is based on the new solar bylaw passed by Belchertown Town meeting last year (2019). Suggested wording to include in the SMART land Use guidelines (section 5) would be:

(7) A parcel will be considered ineligible if it is proposed for a project that contains

- (a) an area that is greater than 20 acres in the fenced array,
- (b) an area that requires forest clearing greater than 10 acres,
- (c) areas with slopes of 8% or greater as averaged over 50 horizontal feet; the local Planning Board may consider waiving this up to 12% based on site-specific design parameters for adequate control of storm-water runoff.

These simple, reasonable, yet effective, limits on the size of large-scale solar arrays, on how much forest can be removed in developing them, and on the slopes on which they are developed provides safeguards on the local impacts that can or should be tolerated. These simple requirements would also provide a clear statement on what is acceptable for these developments, given the purpose of the SMART program, which is to promote carbon-neutral electric generation. Destroying forests to put up solar arrays can hardly be considered carbon neutral.

12. I would point out that this situation is similar to the State's responsibility in providing minimum State-wide standards expected for the environmental protection of wetlands and

storm-water control, and that creation of these minimum standards of protection for natural resources is necessary when the application of public funds is used as an incentive to encourage the construction of large-scale commercial solar developments in Massachusetts. I sincerely hope that you include stronger and more focused mandates in the updated SMART regulations to eliminate the wholesale destruction of forested land for solar development in Massachusetts, and to provide minimum protection for property and public safety.

**Conclusion:** From my perspective every roof, parking lot, highway right-of-way, power-line right-of-way, landfill, and brown field should be utilized for solar power generation before there is any public policy creating publicly-funded incentives for wholesale removal of forests for solar array developments. This is common sense, an “Environmental Policy 101”, which is in essence to “do no harm” in your efforts to improve the environmental quality of our region or the planet as a whole.

Thank you for your attention to this important issue.

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*left: A photograph of the extreme erosion that occurred at the West Orange site in 2018.*

*Above: A photograph of erosion that occurred at the Ware-West Brookfield site (2018).*



*A satellite photograph of erosion that occurred at the Ware-West Brookfield site.*



*Photographs of  
erosional damage to  
wetlands adjacent to  
the Williamsburg site.  
Photographs from Daily  
Hampshire Gazette*





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May 31, 2020

Department of Energy Resources  
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Boston, Massachusetts 02114  
Attn: Ms. Kaitlin Kelly

**Subject: SMART Public Comment re: 225 CMR 20.00 and Guidelines Regarding Land Use, Siting, and Project Segmentation**

Proposed SMART statute 225 CMR 20.00 provides guidelines to encourage the further development of photovoltaic energy sources throughout the Commonwealth. My comments attempt to strengthen those guidelines through some changes and additions. They reflect my experience as a former Belchertown Planning Board member, and as a dean in the College of Engineering at Cornell University and vice president at Colgate University where my responsibilities included oversight of large construction projects.

**Key points in my review are:**

1. The construction measures proposed are particularly challenging for those in the Connecticut River Valley due to ubiquitous bedrock, steep slopes and thin soil layers.
2. Unprotected forested areas appear to be neglected in Land Use and Performance Standards.
3. Civil engineers may certify design elements of proposed SMART eligible arrays, as the revision requires, but additional engineering oversight is needed to ensure public safety.
4. Certification of site plans by a civil engineer does not relieve DOER of its responsibility to ensure the safety of SMART sites.
5. Current models of rain events underestimate the projected volume of future events, leading to underdesigned site engineering and risks to health and safety.
6. Decommissioning arrays mounted in bedrock presents a health hazard.
7. Risk analysis would strengthen support of the SMART program by all parties.

**My comments reflect these principles:**

1. Keep people healthy and safe.
2. Support local and state economic prosperity.
3. Preserve the essential character of communities.
4. Reduce carbon footprints locally and globally (a corollary of principle 1).
5. Acknowledge the merits of opposing points of view.

Some of these principles are in tension and more of one means less of another; nevertheless, this is the lens which shapes my comments. In addition, I've highlighted perceived errors and omissions.

The Connecticut River Valley Hill Towns is one of the most sensitive regions in the Commonwealth as measured by the profusion of underlying bedrock, steep slopes on bedrock, thin soil layers, standing water, lush tree cover, and the region's contributions to aquifers. The SMART program does not adequately protect its people or land, and, on the basis of that premise, DOER should reconsider elements of 225 CMR 20.00, and more specifically the Land Use and Siting Criteria and Performance Standards proposed. My detailed comments follow, and I begin with an observation about SMART subsidies, justice, and my perspective on DOER's obligations.

Just after the promise of a new solar subsidy program last year, many residents received notice that about 100 acres would be clearcut for solar arrays on the tops of the Pelham Hills in Belchertown. This area on West Hill and Smith's Pastures includes some of the most verdant forest in Western Massachusetts. How did we respond? We put together a team that spent hundreds of hours researching 310 CMR 10, 310 CMR 36, 321 CMR 5.00, 301 CMR 11,

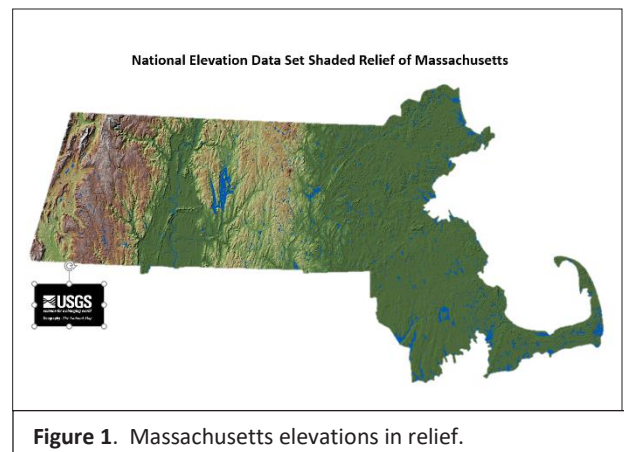
local wetlands law, the Natural Heritage and Endangered Species Program, Areas of Critical Environmental Concern, aquifer protection laws, wellhead protection laws, local zoning ordinances, microclimates, hydrology, dendrology, stormwater management requirements, wildlife protections, site analysis, and soil classifications to position ourselves to evaluate the proposed projects. Along the way, we needed legal assistance that cost \$25,000 to date. Our team fortuitously included subject matter experts, researchers, public relations professionals, writers, fundraisers, attorneys, former planning board members, former town officials, and a former USDA administrator. DOER's SMART program puts pressure on developers to aggressively and quickly move forward with design and qualification while subsidy slots are available. Community members, believing their natural environment is at risk, have no choice but to respond with organizing efforts, attorneys, public relations programs, and the like. Time, money, and intellectual capital is wasted throughout the Commonwealth. I can't solve this problem, but I do know that DOER is an important contributor, and, I hope, a willing architect of the solution. These problems often begin with an incomplete or erroneous understanding of the environmental conditions that impact siting, site preparation, and anticipated construction, and that is where I focus my comments.

#### Context: Importance of the Hilly Terrasin Adjacent to the Connecticut River Valley

Where do people live? Massachusetts has the largest population of the New England states: almost 7 million or about 46% of the region's inhabitants. It is old, having been settled in 1620. It has slightly more women (51%) than men (49%). The largest city in New England is Boston with a population of 617,594 and 4,552,402 in its metropolitan area.<sup>1</sup> Importantly, the population density differs dramatically across the state, in turn influencing the locus of resources and government attention.

#### *Elevations*

Like many states, the Commonwealth reflects a broad range of values in virtually every physical dimension: topography, geology, hydrology, and ecology. Figure 1 illustrates the vast range of elevations in the state's three primary regions: the Berkshire Range, the Connecticut River Valley and the Eastern Shore. Significant elevations above sea level range from Mt. Greylock in the Berkshires at 3,491 feet, to elevations of 1,000-2,500 feet in the Holyoke, Metacomet, Mount Tom, and Pelham Hills adjacent to the Connecticut River Valley.



**Figure 1.** Massachusetts elevations in relief.

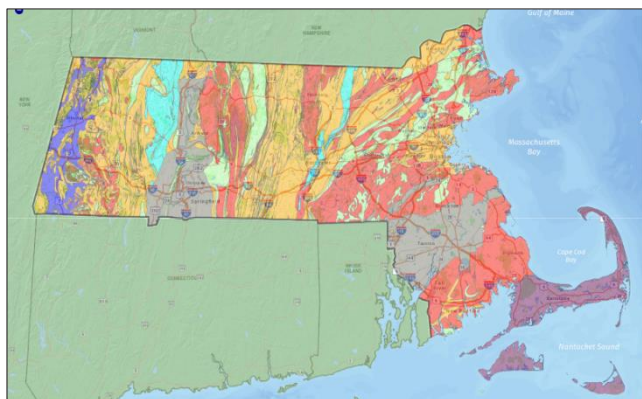
#### *Bedrock*

Underlying the state are extensive fingers of bedrock (granite, per MassGIS Oliver), displayed in red, in the hills around the Connecticut River Valley, the Worcester Corridor, and along the Eastern Seashore as shown in Figure 2. This geologic swath is called the Bronson Hill Sequence (BHS). Among the towns within this area from the Vermont border to the Connecticut border are: Northfield, Warwick, Erving, Orange, Montague, Wendell, Leverett, Shutesbury, Petersham, New Salem, Pelham, Hardwick, Ware, Belchertown, Palmer, Monson, and Hampden. The area of bedrock under these towns (again, in red) is approximately 463 square miles or 296,320 acres, and its impact on most proposed solar projects is substantive.<sup>2,3</sup> For example, a recent solar array proposal by Blue Wave Solar (developer) on land owned by Cowls Lumber Company at 0 Gulf Road in Belchertown sited the array primarily on an area of 2.18 million ft<sup>2</sup>. Bedrock is under 1.80 million ft<sup>2</sup>, or 83% of that lot. In fact, nearly half the Commonwealth is situated over bedrock, and as demonstrated in Figure 3, shallow bedrock and bedrock outcroppings, represented by horizontal lines, are present throughout the central Valley and its hills.

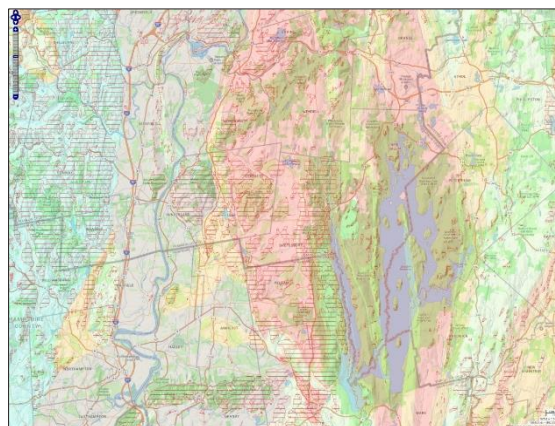
<sup>1</sup> <https://en.wikipedia.org/wiki/Massachusetts>

<sup>2</sup> [http://maps.massgis.state.ma.us/map\\_ol/oliver.php](http://maps.massgis.state.ma.us/map_ol/oliver.php). See Physical Resources/Bedrock Lithology.

<sup>3</sup> Narrow shards of mafic rocks (light green) and metamorphic rocks (orange) are present, as well. Through mineralization mafic rocks become impermeable to water.



**Figure 2.** Extensive swaths of bedrock (granite per MassGIS Oliver), shown here in red, underlie the Connecticut River Valley, Worcester Corridor and the Eastern Shore—about 50% of the state.

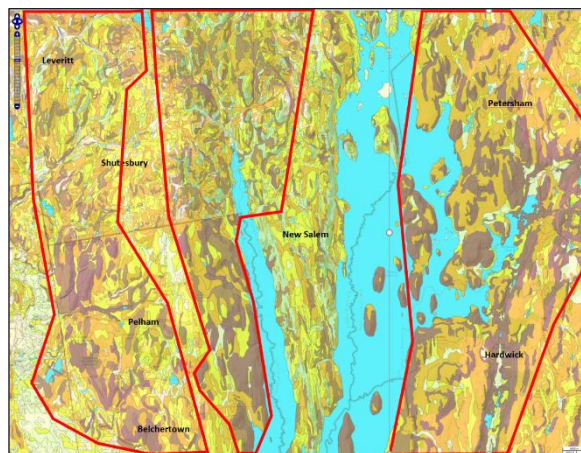


**Figure 3.** This map of the Quabbin area of the Connecticut River Valley shows extreme amounts of shallow bedrock and bedrock outcroppings (horizontal red lines) throughout the Pelham Hills and Holyoke Range areas. Pink areas are bedrock substrate.

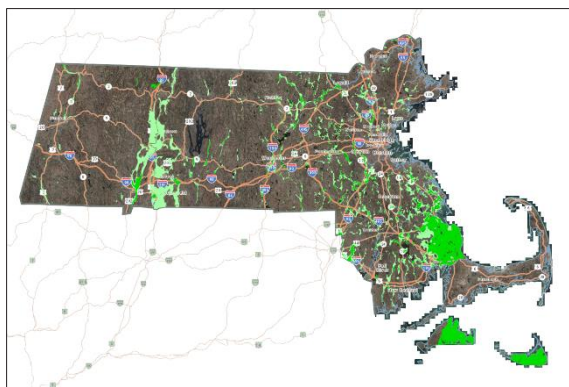
### Slopes

Grades throughout the BHS region's center are shown in Figure 4. Slopes of 25-35% are highlighted in purple and 15-25% in brown. Clearly, the entire area is pock-marked with steeply sloped areas over the bedrock which, in turn, lead to thin soil layers or a lack of soil (outcroppings) resulting from erosion. Much steeper grades are present in the area but cannot be displayed in MassGIS Oliver. For example, grades between 50% and 65% were discovered with Google Earth Pro at the proposed array site at Gulf Road.

Table 1 shows representative hills and mountains with significant elevations in BHS towns. Fifteen of the 20 towns (75%) have slopes exceeding 10% and 8 (53%) have slopes exceeding 20%.



**Figure 4.** This map shows the central Quabbin region of the Connecticut River Valley. Slopes of 15-25% are shown in dark brown and slopes of 25-35% appear in purple. Source: MassGIS Oliver/Soils/Soils by Slope/42.41620° N 72.35509° W



**Figure 5.** Nearly the entire Connecticut River Valley and adjacent land serves as an aquifer serving various locations in Massachusetts.

### Water Supply

Almost the entire Connecticut River Valley and its Hill Towns serve as an aquifer for various parts of the state as shown in green in Figure 5, and, of course, the Quabbin Reservoir services Boston

### Forests

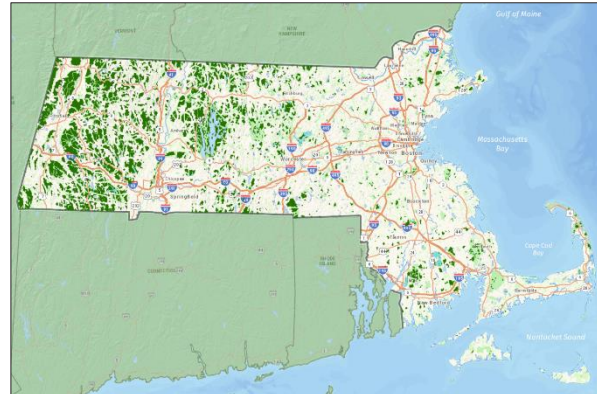
Figure 6 demonstrates the extensive forest cover, in green, in the Berkshires and much of the Connecticut River Valley and adjacent land. Forest cover in the region is typically



classified as Prime 2 and Prime 3 forest land defined as 120-154 ft<sup>3</sup>/ac and Prime 3, 85-119 ft<sup>3</sup>/ac of trees.<sup>4</sup> Both categories comprise very dense forests of Northern Red Oak and White Pine.

Town	Locations of High Land	Elevations of High Land	Grades Near High Land
Athol	Kelton Hill	832	4%
Belchertown	West Hill	1,069	62%
Erving	Rattlesnake Mountain	1,059	26%
Hampden	Minnechoag Mountain <sup>1</sup>	881	13%
Hardwick	Dougal Hill	1,060	10%
Leverett	Ingraham Hill	827	33%
Ludlow	Minechoag Mountain	704	9%
Monson	Moon Mountain	1,100	11%
Montague	Quarry Hill	823	20%
New Salem	Packard Mountain	1,268	7%
Northfield	Brush Mountain	1,297	29%
Orange	Walnut Hill	886	24%
Palmer	Baptist Hill	806	15%
Pelham	Poverty Mountain	913	30%
Petersham	Bald Hill	1,047	6%
Shutesbury	(hills are unnamed)	797	11%
Ware	Brimstone Hill	805	36%
Warwick	Bolster Hill	1,020	67%
Wendell	Bullard Hill	1,194	11%
Wilbraham	Wigwam Hill	844	18%

<sup>1</sup>Same name as Ludlow high land but different spelling.



**Figure 6.** Extensive forest cover in the Berkshires and Connecticut River Valley.

**In summary, then, the hilly terrain around the Connecticut River Valley (the Hill Towns) is located over shallow bedrock, with outcroppings throughout, on steep slopes resulting in thin soils, in densely forested areas, draining to aquifers that serve millions of people.** These conditions result in commercial solar array sites that are exceedingly difficult to model, and they overwhelm even the most sophisticated stormwater management strategies, especially in the absence of trees that mitigate these conditions. This is not theory. The failures at Orange and Williamsburg and the erosion and sediment around the Ware/West Brookfield site are empirical proof of the difficulty.

**My detailed comments that follow compare these environmental conditions with the Land Use and Site Criteria and Guidelines provided in 225 CMR 20.00.**

Comments concerning 225 CMR 20.05(5)(e). Land Use and Siting Criteria.

1. 225 CMR 20.05(5)(e)5. Perhaps the most pernicious, but consequential, issue requiring additional attention in the revision of 225 CMR 20.00 is ineligible land use in which, unfortunately, no guidance is provided with respect to grades on which arrays can be sited. **Recommendation:** Prohibit SMART projects on: (1) array sites with slopes greater than 10% from north to south and east to west, (2) total project areas with slopes greater than 10% from north to south and east to west, and (3) project sites with slopes exceeding 10% on contiguous land extending 2,000 ft from the project boundary.
2. 225 CMR 20.05(5)(e)5. This article provides no guidance with respect to clear-cutting of forests, most of which in the Connecticut River Valley and Hill Towns are Prime 2 and Prime 3 quality and deter soil erosion, as stated above. **Recommendation:** Determine that a maximum of 10 acres of trees may be clear cut from any solar array site.
3. 225 CMR 20.05(5)(e)2 through 5. The section of land use and siting definitions and criteria is difficult to interpret due to confusing writing and missing and inconsistent use of conjunctions “and” and “or.” I created Table (2) to help me understand and recommend it to you, below.
4. Various undefined terms contribute to the confusing organization in this section, including Ground-mounted Solar Tariff Generation Unit, Capacity (only capacity block is defined), Solar Power Generation Unit, and the abbreviations STGU and SPGU. **Recommendation:** Define them in 225 CMR 20.02.

<sup>4</sup> [http://maps.massgis.state.ma.us/map\\_ol/oliver.php/Physical](http://maps.massgis.state.ma.us/map_ol/oliver.php/Physical) Resources/Prime Forest Land

Table 2. Land Use and Siting Criteria in 225 CMR 20.00. SOLAR MASSACHUSETTS RENEWABLE TARGET (SMART) PROGRAM	
<p><b><u>Category 1 Agricultural</u></b></p> <ol style="list-style-type: none"> <li>1. Land in Agricultural Use, or</li> <li>2. Important Agricultural Farmland, and</li> <li>3. Agricultural STGUs, or</li> <li>4. Building Mounted Solar Tariff Generation Units, or</li> <li>5. Floating STGUs, or</li> <li>6. Canopy STGUs, or</li> <li>7. STGUs sized to meet no greater than 200% of annual operation load of an agricultural facility</li> </ol>	<p><b><u>Category 1 Non-Agricultural</u></b></p> <ol style="list-style-type: none"> <li>1. not on Land in Agricultural Use, or</li> <li>2. not on Important Agricultural Farmland, and</li> <li>3. Ground-mounted STGU and capacity &lt;= 500 kW, or</li> <li>4. Building-mounted STGUs, or</li> <li>5. STGUs sited on Brownfields, or</li> <li>6. STGUs sited on Eligible Landfills, or</li> <li>7. Floating STGUs, or</li> <li>8. Canopy STGUs, or</li> <li>9. on land previously developed, or</li> <li>10. sited within a solar overlay district, or</li> <li>11. complies with local zoning explicitly addresses solar or power generation</li> </ol>
<p><b><u>Category 2</u></b></p> <ol style="list-style-type: none"> <li>1. STGUs not in Category 1, and</li> <li>2. ground-mounted, and</li> <li>3. capacity &gt;500 kW and &lt;=5,000 kW, and</li> <li>4. sited on land not previously developed, and</li> <li>5. zoned for commercial or industrial use</li> </ol>	<p><b><u>Category 3</u></b></p> <ol style="list-style-type: none"> <li>1. STGUs not in categories 1 or 2, and</li> <li>2. ground-mounted</li> </ol>
<p><b><u>Ineligible</u></b></p> <ol style="list-style-type: none"> <li>1. SPGUs on protected space, as established under Article XCVII of the Amendments to the Constitution, and do not meet the Category 1 criteria, or</li> <li>2. SPGUs sited in a wetland Resource Area, as defined in 310 CMR 10.04: Definitions, excluding Buffer Zones as defined in 310 CMR 10.04: Definitions, except as authorized by all necessary regulatory bodies, and</li> <li>3. Solar photovoltaic Generation Units sited on properties included in the State Register, as defined in 950 CMR 71.03: Definitions, except as authorized by regulatory bodies.</li> </ol>	

#### Comments concerning 225 CMR 20.05(5)(e)6. Performance Standards.

1. 225 CMR 20.05(5)(e)6 begins its narrative with the phrase: “certification from a professional engineer that the construction of the Solar Tariff Generation Unit complied with the following standards when installed on Land in Agricultural Use, Important Agricultural Farmland, or other pervious open space.” This statement is problematic from a variety of perspectives:
  - a. “Professional engineer” is different from a registered professional engineer licensed to practice in Massachusetts. **Recommendation:** Require the latter.
  - b. “Pervious open space” is undefined, and the term “pervious” has been widely disputed with respect to solar panels and the ground beneath. **Recommendation:** Define the term in 225 CMR 20.02.
  - c. The certification requirement in this section would mean that the certifying engineer would have to be on site or visit the site regularly during construction. A brief walkthrough after construction would not be sufficient to certify most of the requirements, and especially those requiring site preparation and soil manipulation. **Recommendation:** Require certification after planning, 50% and 100% site preparation, and 50%, 75% and 100% construction.
  - d. While the certification requirement is important, the real problems with major capital projects, including commercial solar arrays, begin in design. For example, the Gulf Road project in Belchertown designed by a registered Massachusetts engineer was rejected as unsafe by the Planning Board after some 13 design iterations. **Recommendations:** DOER should plant a flag in the sand during design with respect to its Performance Standards. At a minimum, the statute should recommend additional oversight and plan review by: (1) an independent engineering firm, and (2) a stormwater analysis by an independent hydrologist or geohydrologist.
2. 225 CMR 20.05(5)6 and 7. It is unclear if or how the Performance Standards apply to land in Chapter 61, as well as the specified 61A. This is critical because commercial solar developers are targeting large swaths of forested land for development. The newly written article (7) clearly applies to certain forested land protected by

statute, but not unprotected forested land. In fact, unprotected forest land seems to be classified as Category 2 Land Use in the new article, 225 CMR 20.05(5)7, but if that is true, then the Performance Standards in 225 CMR 20.05(5)6 do not apply because it addresses only Land in Agricultural Use, Important Agricultural Farmland, or other pervious open space (the latter is not typically considered forest). In fact, Category 2 land use seems to be missing Performance Standards. *If unprotected forested land is not addressed in 310 CMR 20.00, or if it is subsumed in any other Land Use category, then all users of the statute should be clear about its omission or classification.* **Recommendation:** This section should specify its application to unprotected forested land.

3. 225 CMR 20.05(5)(e)6a through 6c. While a 500 kW project might occupy a few acres requiring little soil manipulation, a 5 MW project could occupy 25 to 35 acres requiring heavy equipment to grade and smooth. Soil will be grossly disturbed and changed from an A or B grade to grade C or D. The existing statute language, then, would prohibit STGUs from all but the smallest land areas. **Recommendation:** The requirement about undisturbed land is impractical and should be rewritten.
4. 225 CMR 20.05(5)(e)6d. As shown in Figure (2) above, about half of Massachusetts is underlain by bedrock, and much of that is outcroppings or near surficial. For example, in a recent soil survey for the proposed solar array at Gulf Road in Belchertown developed by Blue Wave Solar, 50% of the soil test pits showed bedrock at less than 9 feet from the surface.<sup>5</sup> Of these, 75% found bedrock at less than 5 feet. Groundwater was also a problem. Groundwater was found in 56% of the pits, and in all but one at a depth of less than 4 feet.
  - a. The use of “screw-type, or post driven pilings,” as suggested by the statute, would be impractical, leaving only concrete ballasts or hammer drilling in the bedrock substrate as options. Based on the prohibitive cost of thousands of ballasts for a commercial array, the developer would choose to hammer drill the posts into the granite and concrete grout the holes. This is a problem. To decommission the facility and remove the array, the only option would be to cut the steel posts below grade, in turn producing large quantities of iron oxide (rust) that would infiltrate aquifers throughout central Massachusetts. Small amounts of rust are toxic to fish and reptiles, iron poisoning is debilitating to people, and rusty water would be objectionable.
  - b. This section of the draft states that soil-penetrating mounts should not be used “unless the need for such can be demonstrated.” The question here is: how will the need be demonstrated? This section gives no guidance with respect to the need for and importance of test pits and/or borings, and numbers and locations of both as delineated in the Massachusetts Stormwater Handbook. **Recommendation:** (1) Remove the phrase “unless the need for such can be demonstrated” and prohibit permanent anchor systems that must be cut when decommissioning, and (2) reinforce and restate Massachusetts Stormwater Handbook regulations concerning numbers and locations of test pits.
5. 225 CMR 20.05(5)(e)6f. The phrase reads: “no concrete...in the mounting area other than ballasts or other code required surfaces...” This requirement is impractical as noted above.
6. 225 CMR 20.05(5)(e)g. This article warns against installations that negatively impact soil and water conservation or stimulate erosion or water runoff. That salutary objective is masked by two problems that plague many proposed solar arrays, even those sited on modest slopes: (1) underestimates of future rainfall amounts due to global warming, and 2) stormwater projection models do not account for stormwater over frozen ground and freeze-thaw cycles, a primary cause of flooding in Western Massachusetts. **Recommendation:** Require developers to use realistic estimates of future rain events. Work with the researchers in the Northeast Climate Center at UMass Amherst to produce a range of likely 100-year water events over the next two decades, and then use the range to determine stormwater runoff amounts and velocities.
7. 225 CMR 20.05(5)(e)6i. This point states: “maintain vegetative cover to prevent soil erosion.” During construction on all but the smallest STGUs, the vegetative cover will be eliminated as a result of site preparation and, as noted above, soil quality will decline. Vegetative cover will not be preserved during installation and likely will take some years to recover, if ever. Recovery may be impossible on slopes that

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<sup>5</sup> See the GZA report on test pits dug on December 18 and 19, 2018 for the proposed 0 Gulf Road solar array project.

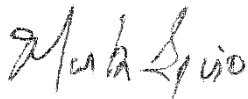


exceed 10% or so, or on surficial or near-surficial bedrock, or on sites with high water tables, including water exposed through excavation. A succinct analysis of the problem is provided by Blue Wave Solar landscape architect Thomas Benjamin in his letter of December 10, 2018 to the Belchertown Planning Board: “Existing soils will be vulnerable to considerable compaction by equipment during solar array construction activities. Compaction will occur during site preparation activities, including removal of existing site vegetative cover and regrading. Further compaction will occur during erection of array tables, associated solar generation components, and establishing vehicular access-ways. Exposed, compacted soils will also be vulnerable to construction phase erosion.” **Recommendation:** Prohibit building on sites with slopes greater than 10%. On all sites require loamy soil additions to stimulate vegetative growth.

8. 225 CMR 20.05(5)(e)6 and 7. Good engineering design minimizes, but rarely eliminates, risk. It follows that failure to thoroughly identify and explore risks during design is an important contributor to systems failure. For this reason, engineering projects that potentially affect health and safety, including SMART projects, should require a risk or failure analysis in which practical risks are identified, impacts defined and quantified, probabilities assigned to risks, and mitigation measures specified. This process, typical of many major construction projects, gets all parties focused on potential problems and solutions early, and in turn, avoids the cyclical, repetitive cycle of design, analysis, risk identification, redesign, reanalysis, etc., that soaks up the time and resources of residents, planning boards, conservation commissions, courts, developers, and owners. Examples of risks associated with the proposed SMART program include: flooding due to underestimates of rainfall, flooding over frozen ground, fish kill due to entrained sediment, iron toxicity, panel wind damage, malicious destruction, inadequate battery storage, battery fires, transformer leakage, severed conduits, first responder triage, and inverter failure. By ensuring that remediation plans are in place, comprehensive risk assessments protect the program sponsor, developer, and most importantly, affected residents.  
**Recommendation:** Require a risk analysis as a component of every SMART project, and broadly share it with residents, town officials, planning boards, and conservation commissions.
9. 225 CMR 20.05(5)(e)7. The Siting Criteria language does not address acceptable slopes, bedrock presence, and thin soil levels that may not have the capacity to transport adequate amounts of water from the site. They fail to address soil depth, bedrock depth, surficial water management, groundwater depth and management, array slope (within the fence), project slope (outside the fence but within project boundary), impact area slopes (outside the project boundary), aquifer distance, aquifer feeders, detention basin composition, volume, and location, infiltration basin composition, volume, and construction, among other variables. They completely fail to recognize the impact of trees on temperature mitigation, humidification, and surficial and groundwater mitigation. In summary, the Performance Standards and Guidelines read like a random collection of some variables that could affect DOER sites, but certainly not the comprehensive list of factors DOER and every applicant should consider when applying for the SMART program incentives. **Recommendation:** Reconsider the issues raised throughout this paper and partner with all concerned in developing an incentive program that makes sense to owners and developers while protecting the health and safety of community members

Thank you for the opportunity to share my thoughts about the proposed SMART program. I hope they were useful and I look forward to the next iteration.

Sincerely,



Mark K. Spiro

May 29, 2020

Department of Energy Resources  
100 Cambridge Street, Suite 1020  
Boston, Massachusetts 02114  
Attn: Ms. Kaitlin Kelly

**Subject: SMART Public Comment re: 225 CMR 20.00 and Guidelines Regarding Land Use, Siting, and Project Segmentation**

I write with my concerns regarding the April 15, 2020 revisions to the Massachusetts SMART program. I serve on both the Belchertown Planning Board and Belchertown's SolarizeMass Committee, so have insights on both small and large solar in our area. Last year the Planning Board reviewed 9 applications for large-scale commercial solar installations—each in a hurry to beat the others into the SMART queue. The Board permitted 6 of the projects, denied just two, and one is still in redesign. Our SolarizeMass team wrapped up in March 2020, having secured 73 signed contracts for domestic solar installations, and would have welcomed more. By any measure, our Green Community has been a solar-friendly town.

I also serve on the Board of Trustees of the Belchertown Historical Association (founded in 1903 to preserve 100 acres of pristine forest) and am a founding member of Friends of the Pelham Hills (FPH), first organized to oppose several large-scale commercial solar arrays threatening 250 acres of sloped forestland and its cold water fishery, now working proactively with the town's Conservation Commission to secure more of our forestland for conservation.

**Progress, but not there yet**

I commend the DOER for tackling these necessary revisions and am gratified that the proposed revisions offer some of the land use protections identified during last September's comment period. Improved incentives for <500kW and <25kW are great. But we still have some big issues around land use.

**The Greenfield subtractors should be 5 times** what the revisions propose in order to discourage the use of forested and other undeveloped land. In addition to increasing the Greenfield subtractors, limits should also apply to the acreage of the entire development, including the cleared areas that surround the panels. It is a proven reality of these projects that they require significant tree clearing well beyond that needed for the arrays themselves. Were SMART to cap tree clearing for any array at 10 acres and overall acreage at 20 acres, it would both address land-use problems and encourage the development of increasingly higher-efficiency and smaller-sized panels.

**The new energy storage requirements** for > 500kW projects could quadruple the acreage of projects in central and western Massachusetts. The 5MW AC cap in the 2018 SMART typically meant a minimum of 20 acres of panels, already a huge sacrifice of our carbon-sequestering forest habitat. With adders for on site energy storage, that acreage could increase to 80 acres of panels, clearly undermining an intent of that 5MW AC cap. Devastating environmentally, and devastating for property values in the residential neighborhoods expected to embrace 8 of the 9 proposals that have come before our Planning Board since 2018 (only one applicant proposed an array in our industrial zone). All indicators are that on site energy storage at that scale will also add noise to the equation, requiring as they do, more inverters, batteries, and their necessary air conditioning. This patchwork response to our fundamentally inadequate utility infrastructure (see the National Grid Cluster studies) will have unintended but brutal and immediate consequences on our rate-paying rural neighbors. That we don't know the true environmental costs of the eventual decommissioning of batteries and panels is also troubling.

**Strengthen restrictions on siting in BioMap2 land** I am happy to see that the revisions restrict siting in BioMap2 land. This is a commendable and important step. But the new rule should not be gutted by requiring that more than 50% of a parcel fall within the BioMap2. A parcel including BioMap2 should be protected *absolutely*. And given that the BioMap2 system is not yet comprehensive— my own property, for example, rightly appears on BioMap2, while a neighbor's property with identical forest, wildlife, slope, soil type, etc. does not—the rules should ensure for similar restrictions on land not yet on BioMap2.

## Forests critical to Combatting Climate Change

Which brings us to forests: “by far —by thousands of times—the cheapest climate change solution,” (*Science*, 2019: 365 (6448)). Where have the SMART revisions placed forest lands that, for the inconsistent reasons cited in previous paragraph, are not yet on BioMap2? The revisions address land in chapter 61A specifically, but not land in chapter 61 or 61B. We see loopholes in the SMART revisions that developers and large landowners— motivated by the speed and greed factors intrinsic to these incentives—may use to circumvent the added protections. Were they to offer large on-site battery storage to compensate for deforestation could a project that requires significant clear-cutting and grubbing still get itself into a category that should not permit such cutting? Can a landowner/developer secure themselves a spot in Category 1 simply by giving to the town the land on which they've erected their lucrative solar panels?

**Eliminate loopholes** Any loophole language that permits incentives for clear cutting should be eliminated. Far better to encourage forest protection by offering its owners incentives well beyond those offered by Chapter 61. Forest loss diminishes our capacity to mitigate climate change. In the Pioneer Valley, since 2018, 77% of large-scale solar has been on previously undeveloped forested land.



**Competing Interests** To protect against further forest fragmentation many towns and land trusts are scurrying to purchase either forest acreage or its development rights. Friends of the Pelham Hills, with the Conservation Commission, is currently assembling letters of support for a state land grant for the acquisition of undeveloped forest acreage in our neighborhood. The acreage we wish to conserve abuts another large forest parcel whose owner/developer is currently suing the town over a denied special permit for large-scale solar. The 2018 SMART incentives have essentially “outbid” local conservation groups in their efforts to buy development rights on environmentally critical acreages. Pitting one state agency’s mission against another’s is bad policy.

### **Learn from SolarizeMass: Offer Oversight**

An increase in incentives for <25kW “behind-the-meter” solar is good. Residents who installed their rooftop or ground mounted solar under SREC received better incentives than current participants in SolarizeMass do. Such installations with no negative impact on the environment deserve higher incentives.

**Serving on SolarizeMass/Belchertown**, I witnessed an admirable level of support for the community: weekly call-in sessions; careful vetting of every installer who received the RFP, and helpful guidance through the bid process.

This is in stark contrast with interactions between towns CSPI developers. A CSPI engineers who argued for a 5MW array on the neighboring property claimed that mounting more than 20,000 panels on their site’s 10 to 20 degree slopes posed no risks. But our SolarizeMass installer, with whom we contracted for a 16-panel ground-mounted array, ultimately returned our deposit, determining that installing on our 10-15 degree slope into bedrock was “beyond what they could execute.”

**We need the DOER to demand the same caution of CSPI.** The DOER should establish basic safety guidelines that would take incentives out of the equation for some sites. Municipalities like Belchertown have written those protections into their bylaws. But leadership on basic environmental and property protections should come from the top. DOER should disallow projects deforesting more than 10 acres; disallow projects on slopes greater than 10% for both the arrays and their total project areas; disallow projections likely to have issues with stormwater (an ever-increasing threat in our hill towns).

### **A disastrous failure**

**The Massachusetts Attorney General has recently filed a lawsuit** (Commonwealth of Massachusetts vs Dynamic Energy Solutions LLC Case 1:20-cv-10814-DPW) against a developer whose CSPI in Williamsburg caused “irreparable harm,” to a protected cold water fishery. The construction altered “97,000 square feet of protected wetlands and more that 41,000 feet of riverfront area, covering the bottom of the river with the equivalent of more

than an acre of sediment pollution.” The work “caused sediment-laden stormwater to be discharged in extreme amounts from the site, eroding the hillside, scouring out perennial and intermittent streams, uprooting trees, destroying streambeds, filling in wetlands with sediment and causing the river to become brown and turbid.”

This harm has **happened** and is described by our state’s AG as irreparable.. This irreparable harm **happened** on a smaller site, with fewer issues than those at 0 Gulf Rd. in Belchertown.

### **A Belchertown example of community struggle**

Beginning in July 2018, and taking seriously its status as a green community, Belchertown’s Planning Board held 8 public hearings on the 0 Gulf Rd. CSPI. The Board generously allowed and reviewed 13 increasingly convoluted redesigns of a poorly engineered 5MW solar installation on an inappropriate site (like much of western Massachusetts land, forest in chapter 61, steep, with thin soils over bedrock and historically forested). In 2019 the Planning Board voted **unanimously** to deny a site approval and special permit for the proposal. The developer’s response to a unanimous decision: sue the Planning Board. The town’s Conservation Commission had earlier denied a permit based on Belchertown’s WPA bylaws, while heavily conditioning an approval based on the state’s WPA. The developer’s response: sue the Conservation Commission and the Select Board. In addition to the Superior Court lawsuits, the developer filed a request with the DEP for a Superseding Order of Conditions, to which the Friends of the Pelham Hills (FPH) has filed an appeal. The DEP determined that the conditioned approval ought never to have been granted, but allowed the applicant to redesign yet again.

For almost a year this proposal —one of nine such proposals —monopolized the time of the town’s professional staff, its dedicated volunteers on the Planning Board and the Conservation Commission, and more than 50 residents committed to the town’s resiliency. These scattershot lawsuits are squandering the town’s legal budget, as well as that of the FPH. The applicant has repeatedly asked for extensions on their DEP submittal deadline in order that they may “review anticipated changes to the SMART program.” Now, the health and safety of the neighborhood AND the profitability of the development which would at best radically alter, but more likely irreparably harm that neighborhood? Paradoxically, both rest in the specifics of the SMART revisions. With that power must come responsibility and oversight.

In the Belchertown case, the neighbors were well-informed and included a professional hydrologist. The Planning Board was scrupulously fair and also well-informed and concluded that the risks were too great to grant a permit. A failure at this particular site —with its massive clear cutting and grubbing of an established forest, its extreme slopes, its bedrock and soil types and depths, its groundwater at less than 4 feet, its multiple intermittent and perennial streams, its cold water fish resource, its bizarre stormwater mitigation system which includes a hybrid detention/retention basin 400’ long, 16’ high designed for millions of gallons of water and located at the top of a 100 foot slope not 500 feet from an abutter’s

home? A failure at this site would risk not just irreparable harm to the environment, but also to properties and people living below it.

Planning Boards are typically staffed by volunteers and are therefore variable in their level of expertise. Not every neighborhood has a resident USGS hydrologist. Belchertown was lucky to stop — at least temporarily— an impossible installation. Towns should not have to depend on luck to protect their neighborhoods.

### **Leadership from the top: Validate and Emulate Community Bylaws**

**In response to the Gold Rush realities** of large-scale solar developments, Belchertown revised its solar bylaws, passing the revisions by more than a 2/3 majority at its 2019 Town Meeting. Our bylaws are comprehensive and detail-rich. On page 1. Section B, Applicability, a prospective applicant knows immediately that Not permitted are

- (a) Any CSPI of greater than 20 acres in fenced array area.
- (b) Any CSPI requiring forest clearing greater than 10 acres.
- (c) Any CSPI on slopes of 8% or greater as averaged over 50 horizontal feet
- (d) Any CSPI on a parcel with inadequate frontage as defined etc.

This should streamline every application and construction of an eligible CSPI. I'd urge every community to develop their own set of bylaws, tailored to their own needs; bylaws that could make them enthusiastic participants in making Massachusetts fossil-fuel-free. They could then work willing to help developers site appropriate solar in their communities instead of exhausting themselves and their budgets fighting inappropriate ones.

**The DOER would serve itself, the environment, and every community** in the state were they to exclude from eligibility for the SMART program any CSPI requiring forest clearing greater than 10 acres, and any CSPI on slopes of 8% or greater as averaged over 50 horizontal feet.

Doing so would in the long run make the SMART program run smoother, keeping deserving proposals from having to wait in a stalled queue while ineligible ones wage multi-year legal campaigns to pursue inappropriate installations.

I hope that you take this into account as you finalize revisions to the SMART program.

Thank you,  
Elizabeth Pols  
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[epols@admin.umass.edu](mailto:epols@admin.umass.edu)



Judith Mann  
104 North Street Belchertown  
Prof Emeritus and Dean of Humanities Hampshire College

**DOER bears responsibility for ongoing, catastrophic environmental damage throughout the State, brought about by incentivizing massive solar installations, while exerting minimal controls on design, siting, scale or deforestation.** The current and proposed SMART policies are not consistent with environmental stewardship, which must be central to green/clean/renewable energy initiatives. Encouraging utility scale solar growth, failing to establish parameters for siting - which in turns fails to protect wetlands or contain runoff - and the extended de facto policy of inviting deforestation on a massive scale, is irresponsible. And the scale of deforestation is massive – to date, 77% of the approved large arrays have displaced forested land. Throughout the State, damage continues to accrue to these sites, due to the absence of high standards and diligent oversight.

Although a DOER representative admitted publicly in 2019 that the SMART language (discouraging rather than prohibiting tree cutting, and stating that solar development must be permitted unless there was a threat to health and safety), was **intended primarily for residential application**, and was later recognized as problematic, it seems that not much has changed. I am writing nearly the same letter today as I did back then.

**The primary assumption: That building solar arrays is more beneficial than leaving trees in situ.** Developers make the false claim that solar panels are more efficient at reducing carbon pollution than trees are at offsetting it, and that “the land quickly reverts to its original state when the panels are removed”. The fact that trees not only sequester carbon, but produce oxygen, provide habitat, and control temperature, flooding, and erosion, is conveniently overlooked.

As for recovery, the fact is that each and every **array calls for cutting, stumping, and grading the land, thus eliminating the canopy and root system, as well as the native ground cover – all of which hold soil in place.** Erosion can be seen at nearly every array site – which must be viewed via Google Earth, since public access and inspection is prohibited during and after construction. The consistent results of this destruction more than illustrate that any claims for quick recovery (or promises to repair damage) are false.

**Failures to link deforestation to catastrophic storm water runoff.** Designers typically assert that plantings of meadow mix will control erosion. When designers are forced to provide better safeguards, the results resemble a patchwork quilt. Step by step, designs reflect demands made, rather than a unified approach. In Belchertown, Blue Wave Solar presented thirteen plan revisions for a single project over the course of two years, finally

proposing a ‘retention/detention’ pond (a nonsensical mixture of two contrasting methods of dealing with run-off). The pond abutted a boundary and was situated at the lowest point of the array, underneath slopes of up to 65 degrees. Millions of gallons of run-off were to be held back by an earthen structure. The pond and dam were located on a steep, eroding cliff, five hundred feet above a home. (Asked if there was a plan to limit run-off from the site, the response was: “Plant shrubs and such”.) When the project was denied a permit, a legal complaint was immediately filed with Superior Court. This one project could serve as an example of the malfeasance of dozens of developers, over the course of many years, who have not been constrained to adhere to better standards. We cannot leave matters under the control of an industry which exhibits little regard for design standards and diligent oversight.

**Research reveals the central role of forest maintenance in the service of global and State-wide protection of a healthy, clean environment.**

**The use of wasteland is no guarantee:** the re-contouring of a former gravel pit in **Williamsburg, MA** resulted in documented flooding, run-off, and sedimentation, resulting in what the AG described as “irrevocable damage” to wetlands and streams. We can see similar damage in Warren (the developer was sued by EPA for stormwater runoff and erosion in 2015) and more recently, in Ware/West Brookfield, in Orange, and in Williamsburg. Erosion can be seen at nearly every array site – but often it must be viewed via Google Earth, since public access and inspection is prohibited during and after construction. **Will the decision by the AG to sue the developer in Williamsburg prompt a tightening of the SMART program, or more tinkering?**

**As town planners have stated, the vague language of the SMART program has left towns burdened** with the review process, which derails their ongoing workload, as well as hefty legal expenses. Under wetlands protection, for example, towns can rely on a minimum set of protections under the law, which they may reinforce with additional legislation. For solar legislation, however, we suffer from the failure to meaningfully define parameters. “Recommending” that solar arrays not replace trees, demanding that permits be approved with exception for health and safety, or authorizing partial use of protected forests serves only to introduce the hen to the fox. Is flooding and erosion likely to result in contaminated water? Of course. But how to prove it in advance, without limits placed on slopes? What developer will readily admit faulty design, or be guided by altruism or even common sense when cramming panels onto acres? **And what form does redress take when land and waters are inundated?**

Adding to the burden of town-by-town review is that **each site presents complex issues** of hydrology, geology, soil characteristics, threats to wildlife and habitat, and incursions into wetlands and watersheds. It takes expertise beyond the usual capacities of residents or board members to assess designs and verify figures and calculations.

Once built, in addition to the dangers delineated above, are added unwelcome noise, visibility, and contamination, the irony is that there is a great chance that the excess energy output will be relegated to massive banks of batteries and air conditioners, due to **connectivity issues**. Some approved and even completed projects are still on hold; others are operational, but causing local surges and brown outs. Developers readily admit that the completed projects are **investments** which will be sold upon completion, effectively undercutting promises to oversee and rectify problems. **Vulnerable landscape is treated as wasteland, and the invaluable resource of forested land is squandered.** We mischaracterize factories as farms, with dire consequences.

The residents of the State deserve and expect better. In Belchertown active opposition to the Blue Wave project garnered attendance at meetings. 300 signatures on a petition to deny a permit, and an overwhelming vote to enact strict **new solar bylaws**. These bylaws have subsequently been approved by the AG, and are now seen as a helpful template by area towns. They are relevant throughout the State, as many communities grapple with poor siting and worse design, pushed by aggressive developers, landowners and legal teams. **Why must citizens, courts and town boards be forced into these machinations, on an ad hoc basis, without real guidance or protections from the Doer and SMART program?**

The growth of smaller scale community and residential solar projects more meaningfully serves our common goals, as opposed to the industrial scale arrays, which rarely demonstrate best management practices with regard to land use and environmental impacts. Yet **potential profits are so great that the current weak disincentives, concerted conservation grant efforts, and even the few lawsuits brought by the government, have had a negligible impact.**

Belchertown is one of many Green Communities in our Commonwealth, and accordingly, we have embraced smaller scale solar and the goal of clean energy. The State must support our efforts in safeguarding the health, safety, and well-being of residents, and the environment, by better SMART regulation. Truly clean and renewable energy sources must outweigh the monetary concerns and short sighted demands of (non-resident) landowners and developers. As one member of the Friends of the Pelham Hills, I know that **we would be happy to discuss our concerns further with you.**

Sincerely,  
Judith Mann



Marian Mesrobian MacCurdy, Ph.D  
University of Massachusetts, Amherst  
maccurdy@ithaca.edu

Ms. Kaitlin Kelly  
Commonwealth of Massachusetts  
Executive Office of Energy and Environmental Affairs  
Department of Energy Resources  
Re: Comments on the SMART Regulations  
Date: May 29, 2020

#### Overview:

The large number of commercial solar arrays proposed recently in Massachusetts given the impetus of the Solar Massachusetts Renewable Target Program demonstrates that clear and comprehensive regulations of solar arrays in the Commonwealth at the state level are required. However, the primary issue that towns have had to confront—where to allow these arrays to be built—has not been adequately addressed by these proposed guidelines. Many environmental experts believe that cutting down forests to build commercial arrays is antithetical to the purpose of the program itself—to preserve our environment—but your guidelines ignore this key issue. Indeed, the priorities seem to be backward: instead of encouraging building on school rooftops, over parking lots, and other more appropriate sites, too many of these projects are just where they should not be—on forested hillsides, leading to some dramatic and costly failures such as we have seen in Williamsburg and Orange and widespread erosion as demonstrated by the array in Ware. While the guidelines prohibit arrays in protected areas, they do not address the manifold dangers presented by large commercial arrays built on steep forested slopes, especially on bedrock, which covers a large portion of our state, especially in the hill towns west of Quabbin. The presence of bedrock must be taken into account when developing site placement guidelines because bedrock on forested slopes presents intractable problems with erosion, stormwater run-off, and decommissioning. The lack of guidance in this issue is forcing towns to pass bylaws that protect their forested hillsides—and the people and property below them—but, of course, this can leave towns in the position of having to defend their decisions in court, an expensive and time-consuming effort. Your regulations should provide appropriate limits on the building of commercial arrays on forested hillsides, especially on bedrock, and they should allow towns more regulatory control without fear of lawsuits since the towns and their residents pay the price for any failures that affect the community. Assuming bedrock is not an issue on a given site, the current Belchertown solar regulations appear reasonable—slopes are limited to 8% with the possibility of up to 12% by special permission; forested land is limited to 10 acres. I urge DOER to adopt similar restrictions.

#### Purpose and Application:

It is startling that the only reference to “health and safety” in this section is the hope that increased use of solar will “improve public health and safety.” I saw no language devoted to ensuring that the installations supported by the SMART program must ensure the safety of residents, wildlife, and

our natural resources as well. Many of the issues that appear thus far not to be addressed by the new regulations relate to just these issues, especially in forested areas.

#### Land Use Categories:

According to the Guideline, Category 1 land use is divided into two types: Agricultural and Non-Agricultural. Chapter 61A is listed by the state as agricultural only, that is, not land devoted to forestry, which is considered 61. Is forestry land therefore considered as non-agricultural or in specifying only land in 61A do the guidelines imply that no forested land may be used for arrays? I am assuming that forested land may be considered since Article 5 Ineligible Land Use does not mention forested land as ineligible to receive a Statement of Qualification under the SMART program, but this needs clarification, especially since forested hillsides present such difficulties and should be protected.

#### Performance Standards:

First, this section is confusing in its definition of the land that can be used for units with a capacity greater than 500 kW: "...when installed on Land in Agricultural Use, Important Farmland, or other pervious open space." What does "pervious open space" mean in this context? Does it include forested land not protected by statute, for example? Forested land, especially that on slopes with bedrock should be off-limits, but if it is included, the language that follows presents serious problems. This section (6d) states the "ballasts, screw-type, or post-driven pilings and other acceptable minimal soil impact methods that do not require footings or other permanent penetration of soils for mounting are required, unless the need for such can be demonstrated." This is language with a massive loophole included. What about the need NOT to use this technology? Solar arrays installed on a rocky hillside need either concrete ballasts or steel pilings since much of the land in central and western Massachusetts is situated on bedrock. Decommissioning a site erected on steep rock-laden hillsides that used steel pilings would be expensive, difficult, and result in some intractable problems such as the erosion of rusting metals into water supplies, creating a safety hazard. In addition, the guidelines mandate that a certified professional engineer must approve the project. From our experience in Belchertown with solar array projects two engineers can look at the same project and come out with opposite views. Trusting only one, especially one employed by the applicant, is akin to allowing the defendant to be the judge and jury at his/her own trial.

#### Land Use and Siting:

The complex issues that building arrays on forested hillsides present do not appear to be addressed in your guidelines, which means large areas of western Massachusetts would not be protected against destructive development. Although fallow flat land is available in some valley locations, most of the undeveloped land north and west of Worcester is on forested hillsides. Such sites pose manifold problems for safe installation and use of solar arrays. The arrays in Ware, Orange, and Williamsburg demonstrate the massive erosion and stormwater damage possible from building arrays on deforested hillsides. The levels of stormwater can disrupt ecosystems for years. Significant erosion has occurred at the Ware site. In Orange after removal of all trees and other vegetative matter, a historical cemetery was flooded, and in Williamsburg a coldwater fishery, protected

wetlands, and a river were swamped with stormwater, resulting in a lawsuit brought by the state against the developer. Even more problematic, these western Massachusetts hillsides are often on bedrock, which presents serious obstacles, as discussed previously. The SMART regulations posted do not appear to address the dangers inherent in building arrays on forested hillsides, especially those on bedrock, a serious oversight.

The proposed categories for land in Chapter 61 (assuming 61 is included as well as 61A) are inadequate to protect our forests, which in themselves are a powerful weapon against climate change. While Massachusetts is the 8<sup>th</sup> most forested state in the country, it is also the third-most densely populated area. Equally important, 75% of those forests are owned by private individuals, not the Commonwealth, and over 40 acres of our state's land go into development every day. When the "hidden" effects of development are included, including roads and building lots, the human impact is about 78 acres per day. The state imports 98% of its wood needs. Seventy-one percent of wildlife habitat statewide lacks permanent protection and is in danger of development and subsequent loss of habitat. ["Losing Ground: At What Cost," [www.massaudubon.org/losingground](http://www.massaudubon.org/losingground)]. Yet these guidelines make no mention of the Prime Forest designation from BioMap2 information, nor do the guidelines provide any restrictions on deforestation.

Much of this development in western Massachusetts is located near environmentally sensitive areas. One such commercial solar array site proposed for Belchertown is located between two areas designated as within the BioMap 2 Critical Natural Landscape area on a steep, forested hillside on bedrock near a protected coldwater fishery and the town's water supply, and close to a residence on an adjacent property below, presenting a clear danger to health and safety. A section of the property is on protected land, yet most of the land is, inexplicably, not included in BioMap 2 protected areas in spite of the similarity of its features. I strongly suggest that the regulations need to be strengthened by eliminating the 50% of parcel caveat that opens up protected land to solar development. This project is a classic case that can prove the rule: this parcel plays a crucial role in protecting the community and its water sources. Given the danger erosion and stormwater pose to the fishery, to residents and property down below the proposed detention pond and to the town's water supply, the Planning Board denied the application, and now the case is before the courts, causing more time and expense for a community that can ill afford it. SMART regulations covering building arrays on forested hills, especially those with bedrock, should be much more restrictive than they appear to be in this draft given the problems such projects can cause. This particular Belchertown project, one that poses multiple risks to our local environment, including our homes and our water, took the Planning Board, the Conservation Committee, the town planner, and countless numbers of concerned citizens over two years and many thousands of dollars to fight, and we are still at it. We were presented with 13 different versions of engineering designs, none of which could protect our wetlands and private property because the site itself posed dangers that could not be remediated: a close to 400-foot long detention basin, 16 feet high, on a 30-50 degree slope, with one section below as steep as 60 degrees, perilously close to a private residence 500 feet below. Such projects should be screened out by your guidelines. It is only because among our engaged residents is an experienced US government hydrologist, an administrator with many years' experience with large construction projects, a plant biologist who has served on town boards, and many other talented and dedicated residents that we had the appropriate expertise to discover the



massive holes in each of those 13 plans. These kinds of dangerous sites should be weeded out by state regulations, so the responsibility to ferret out the serious problems they present does not fall primarily on those most affected by them, often leading to high expense and much anxiety to those downhill and downstream of such projects, not to mention the time sink for local officials. Please note, this is not a NIMBY issue. These issues are health and safety related. The first job of a public official is do no harm. This is what your regulations must ensure.

#### Compliance:

The concern that solar arrays built on steep forested sites could produce dangerous erosion has already been demonstrated by the arrays in Ware, Orange, and most recently Williamsburg. Stiffer regulations with consequences could prevent failures, by weeding out inappropriate sites. We are in uncharted waters with most of these arrays: for example, how can vegetative cover be maintained on a steep hillside? If a company is found in non-compliance what will restore a forested hillside to its original state once the mature trees have been cut down? And if a coldwater fishery is damaged how many years would it take to restore it? Non-compliance on a relatively safe site would be less catastrophic than what we have seen in Williamsburg, for example.

#### Local Control

Page 5 of the Mass Audubon report, *Losing Ground*,” shows the twenty municipalities with the greatest area of forestland converted to development. Five of those areas are in the south central/western part of the state, south and west of Quabbin Reservoir, including my community, Belchertown. The rush to commercial solar development has inundated communities in western mass with applications. Local towns need to have more control. Town officials, planning boards, and the public know what they need and what risks they are willing to take. They should be free to decide without having to spend massive quantities of money and time on legal challenges.

#### The Larger Picture

The larger goal—to counteract climate change—needs to be the priority, and that means the rush to solar must not eclipse the benefits trees provide. The profits these companies can make must not drive these decisions; what is best for our communities should. The SMART regulations need to address forest destruction more directly. A recently published study (Jean-Francois Bastin et al. ” *The global tree restoration potential*, *Science* (Science, 2019: 365 (6448): 76 DOI: 10.1126/science.aax0848) demonstrated that planting trees throughout the world in an area roughly the size of the United States would result in the absorption of nearly 830 billion tons of carbon dioxide, approximately what humans have discarded into our environment in the past 25 years. As study co-author Thomas Crowther, a climate change ecologist at the Swiss Federal Institute of Technology, said, “This is by far—by thousands of times—the cheapest climate change solution” and, according to the article, the “most effective.”

In addition to the other more well-known benefits of trees (they produce oxygen, remove pollutants, and cool the environment by 6-10 degrees) they also, of course, provide necessary habitat for

wildlife, which can have significant effects on disease transmission. Recent research demonstrates that forest fragmentation may contribute to the startling rise in tick-borne illnesses. Deforestation has produced fragmented forests, those broken into little pieces by roads, farms, and housing developments. Areas of patchy woods cannot support predators such as foxes, hawks, and owls that prey on mice and other small mammals that spread Lyme; such predators need big forests to survive, as opposed to coyotes that can live virtually anywhere but do not have much effect on rodent populations because they tend to spread out, so fewer coyotes live in areas that used to harbor larger numbers of foxes. Forest patches smaller than three acres have an average of three times the number of ticks than larger fragments, and seven times more infected ticks. According to a study supported by the National Science Foundation, as many as 80% of the ticks in the smallest patches were infested with Lyme, the highest rate scientists have seen. Increasing the size of forests and avoiding fragments smaller than five acres could help reduce the incidence of Lyme. Where there were fewer foxes, there were more instances of Lyme disease. [Taal Levi, et al. Proceedings of the National Academy of Sciences]

The area west of Quabbin has, as pointed out, unique characteristics that make it more vulnerable to exploitation—its forested slopes on bedrock which make it prone to costly flooding events which would be only more prevalent with denuded hillsides. The argument that solar arrays benefit us all rings hollow here because the local communities pay the price for these arrays by the loss of habitat and the risks to water, wildlife, and property, but they get no break on electricity prices. So once again it appears that western Massachusetts is being asked to sacrifice its resources for the eastern part of the state. The history of the loss of area towns to Quabbin Reservoir to supply water for the eastern part of the state is still known and felt in western Massachusetts. Water rights are important here. The water from one of the largest reservoirs in Belchertown, Knight's Pond, is off limits to town residents since it has been designated a water source for Springfield. Belchertown water, therefore, must come from its streams and other aquifers, which means any development that threatens local water will be heavily scrutinized as it must be. Local residents need state regulators to ensure their towns' health and safety as regulations are developed for implementation of commercial solar power. These proposed regulations are insufficient because they do not take into account the unique characteristics and needs of this area.

These needs are especially critical now as we face a climate change crisis, which will increase the amount of rainfall in the Northeast. The Northeast Climate Center at Cornell University states on its website that 1 in a 100-year rainfall events are now likely to occur twice as often in the Northeast. Therefore, it is important for rainfall estimates to include rainfall projections, not simply historical data, because the latter are now inaccurate. Increased rain makes our trees more crucial than ever. Trees hold water. Building commercial solar arrays on deforested steep hillsides would produce increased storm water, flooding, and dangerous erosion, even more destructive in the event of rain over frozen ground events, which have become more common with global warming. Indeed, Gulf Road in Belchertown was flooded in January 2019 after a rain over frozen ground event occurred that took out culverts and caused much damage to the road. Had the hillside been denuded of trees, the result could have been catastrophic for property. Dr. Ray Bradley, lead researcher and professor at the UMass Northeast Climate Science Center said in a meeting in January 2019 that “this has been the wettest year for Amherst since 1838. Sixty-four inches of water have fallen in one year.”

He explained that “Our storms have more energy and frequency, and this will only increase. Much of the precipitation will be in winter and early spring. Groundwater is at the surface,” which means the ground is saturated and additional water from storms will be more likely to flood downstream, given the high water table. Dr. Bradley urged residents to raise these issues with our political leaders to ensure that appropriate policies are adopted to deal with the increase in rainfall and consequent flooding. The erosion from deforestation, especially on hillsides with bedrock, would only serve to exacerbate these problems. We must ensure that solar will not be bought at a price we cannot afford to pay.

31 May 2020

Department of Energy Resources  
100 Cambridge St., Suite 1020  
Boston, MA 02114  
attn: Kaitlin Kelly

I write to address my concerns on the Department's Emergency Regulations for the Solar Massachusetts Renewable Target (SMART) program. My concerns are for the small communities with limited professional staff in their Planning and Conservation offices. The increase in projects hastily submitted in the hopes of reaping large profits provided by SMART program incentives will result in poorly considered projects such as the solar array in Williamsburg, MA that has destroyed a local fish habitat and is the focus of a legal action by the Attorney General's Office.

The decision to combine Eversource East and West energy capacity blocks into a single service territory will put a tremendous burden on the volunteer members of the western region's Planning Boards and Conservation Commissions. All the solar development capacity for Eversource East will be sited in western and central Massachusetts. This is an unreasonable situation for smaller communities to be saddled with.

Additionally, I would like the Department to make the Greenfield Subtractor five or ten times the current level and apply the subtractor to the whole footprint of a proposed development, not just the ground beneath the solar arrays. The subtractor should make this development cost prohibitive.

Cutting old established forest land for solar panels is not a good trade. It contributes to fragmented forests, reduces local opportunities for snowmobiling, hiking and hunting.

Clean energy is supposed to protect against mining, drilling and destruction of natural ecosystems. Destruction of undeveloped farm land and extensive forests for the siting of solar arrays does not make sense. Every mall parking lot and roof top should be covered with solar panels before any agricultural or forest land is lost to commercial solar projects.

Thank you for your consideration.

Sincerely,

Sean B. Tarpey



**Marcy Thomas**

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[mthomas@wellesley.edu](mailto:mthomas@wellesley.edu)

May 31, 2020

Department of Energy Resources

100 Cambridge Street, Suite 1020

Boston, Massachusetts 02114

Attn: Ms. Kaitlin Kelly

While the creation of the Solar Massachusetts Renewable Target Program (SMART) comes from good intention and shows considerable thought, there remain serious problems. I write from the perspective of one who has served on Conservation Commissions, an Open Space Committee, and a Town Master Plan Committee. I was a founding Board member of the Medway Community Farm and I have taught Biology, Environmental Studies, and Writing at Wellesley College for the past thirty years. Please consider the following points as you revise the incentives

Land Use and Siting: Since each site has unique complex parameters, it is nearly impossible to adopt a blanket statewide policy. For instance, **forested lands under Chapter 61 are unique and should have their own Category of Land Use**. Currently, they do not adequately fit in any of the three Categories. I would like to see these important lands better protected as they serve as crucial carbon sinks and provide irreplaceable ecosystem functions. Many believe that forests should never be removed to install large solar facilities. While the SMART program refers to Core Habitat, Priority Habitat, and Critical Natural Landscape, I find no mention of the Prime Forest designation from the BioMap 2 data. This is a critical omission.

Compliance: We have already seen several dramatic failures of completed solar facilities due to lack of compliance and comprehensive planning. It is one thing to write “no removal of all field soils”, or “address existing soil and water resource concerns that may be impacted”, or “maintain vegetative cover to prevent soil erosion”; but it is another thing to enforce it. **There is no effective mechanism to ensure compliance** and Towns are left trying to fix this in a patchwork manner. This is a huge problem as we most recently have seen in Williamsburg. Your program provides the carrot in terms of financial incentive, but no stick.

Local control: It should be acknowledged that the intricacies of each proposal cannot be fully appreciated by an organization miles away. **There should be more local control**. Towns should have ample latitude to decide the fate of land within its borders through review by the Conservation Commission, Planning Board, and public input. The

local people care about the land, developers from out of state do not. And once the towns make a decision, that decision should, in almost all cases, be honored. The towns should not have to fight large corporations in costly legal battles to defend their decisions. Money earned from solar power goes directly to large corporations and the towns get little in return. Unfortunately, in some cases the SMART program has inadvertently set the towns up for failure and exploitation. Perhaps we could figure out a way to enrich the towns rather than to impoverish them.

Size:     **As the size of a development increases, problems and deleterious effects are amplified.** Because of the SMART incentive, many towns have had to scramble to pass solar by-laws to prevent exploitation of their resources, for other towns it is too late.

The incentives:     The decision to encourage solar development should be carefully weighed against what we can best predict will be lost. In some cases, we know it is not worth it. Mature contiguous forests are irreplaceable and more effective in long-term mitigation of climate change. The heritage of the Commonwealth is founded on some of these irreplaceable tracts of land, many of which are not sufficiently protected under this program or under the Core Habitat, Priority Habitat, or Critical Natural Landscape classifications. Please consider revising this program in an even smarter way to save the natural resources and characteristics that make this State unique while balancing the need for green energy. Thank you for your consideration.

Marcy Thomas

mthomas@wellesley.edu

Dr. Lee Paddy  
23 Everett Ave.  
Belchertown, Ma., 01007

Department of Energy Resources  
Boston, Ma.  
Attn. Kaitlin Kelly

I am writing to ask that the DOER use it's position and authority to **create a win/win situation** between large scale developers and small towns concerning the goal of increasing solar production.

As it now stands, our economically struggling small towns do not have the monetary resources to stop Large Scale Commercial Solar Development when the project is poorly sited, poorly designed and/or unsafe. These **out of state companies and investors can outspend our small towns in the courts**, even when towns deny the permits based on designs failing to meet by-law standards and requirements. Such is the case with Blue Wave in Belchertown, Ma. Most small towns don't even have solar bylaws and have been overwhelmed with the rush of companies coming in to make their claims.

DOER gives incentives to build these projects to out of state companies that do not have the expertise to build on sensitive sites, some of which are not appropriate due to health and safety issues. And yet, **the state does not provide the protection towns need.**

For example, **concerning the DOER's proposal to combine Eversource East and West energy capacity blocks into a single service territory**: this will allow all of the solar development capacity for Eversource East in eastern Mass to be sited in western and central Mass, **placing undo solar development pressure on communities in the western and central part of the state.**

Another example is the proposal to allow solar construction on protected lands when a project could cover up to 50% of the parcel!!! There is no protection for the land or towns in such a proposal. **I strongly urge you to eliminate the "50% of parcel" caveat that opens up protected land to solar ray installations.**

There should also be a **required Buffer Zone** around protected Priority Habitat, Core Habitation and Critical Natural landscape lands.

If the real goal is to become "green", we need to protect our natural resources: forests, water, habitat, etc. Mass Audubon addressed the need to protect not only the mature forests, but also the forests that have the potential to mature. Our loss of mature forests is a major factor in our loss of species that are an integral part of maintaining ecological balance. They also play a critical role in mitigating climate change. **UMass research shows**

**that New England is positioned to heat up faster than the rest of the country due to the melting of the glaciers and change in wind and weather patterns.**

Another concern towns have is the increased rainfall, change of temperatures that create more rain and thaw and freeze phenomena particularly in wooded, sloped areas. None of the “guidelines” address these health and safety concerns. Our towns are trying to prepare for the future and sustainability. Your guidelines show that you have not looked at how to allow large scale solar in appropriate, safe ways. You are not considering how to create a green state with all of the factors that are essential for ecological balance and sustainability. Please refer to the Harvard Study on Forests and Sustainability, Petersham, Ma. They have taken into account the loss of forested land(40acres/week), the need to have productive forests, climate change and the essential role forests play.

They have designed a proposal to reach a critical balance between these factors. **We don’t have time to waste! We need your help in securing our natural resources as well as safe solar!!**

Please refer to the letter submitted by Mark Spiro. He has included maps that show the land topology in Western Mass, which is unique due to the Glacial formation of much of the valley. There are numerous places where the slopes are greater than 10%, slopes that are mostly bedrock where the forests are essential, holding an intricate and fragile ecosystem in place. Most of these areas are rich with underground springs that provide water for surrounding towns.

These lands cannot be safely mitigated to provide a space to build Commercial Solar. Most of these are in residential areas near conserved land for wildlife habitat and corridors for animal migration. **Towns are working feverishly to conserve the very land you are giving incentives to out of state companies to develop!** We cannot replace the maturing forests in any timely way when they are being clearcut, stumped etc. These sensitive sites are intricate and fragile in their ecology.

**We need your guidelines to have teeth as requirements when it comes to sloped and forested land that are essential to our goals of creating a real and sustainable ‘green’ future for our towns, the state and New England.**

Please read Mark Spiro’s paper for details and specific suggestions, along with hydrologist Steve Garabedian’s letter for technical details.

We need DOER to look at all of the variables when it comes to resources and “being green”. Otherwise, we are creating more problems by having a narrow perspective.

Thank you for your time and consideration.

Lee Paddy