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Comment Letter on Interim Clean Energy and Climate Plan for 2030

Submitted by Doug Pope, President

Dear Secretary Theoharides:

We appreciate the opportunity to provide comment on the Interim Clean Energy and Climate Plan for 2030 informed by the Massachusetts 2050 Decarbonization Roadmap. We will confine our comments largely to how the 2030 CECP affects the solar industry.

Pope Energy is a larger scale solar developer that, since 2011, has been originating, developing and if required, constructing ground-mount solar, commercial rooftop solar, and more recently, agricultural solar projects on behalf of investors.

Since 1986, the Pope companies have been design-build and finance general contractors, building commercial construction projects throughout New England.

The Strengths of the Massachusetts Solar Programs:

Lead by the legislature, regulations established by EEA through DOER and D.P.U. have developed SREC and SMART solar programs that have grown a solar industry in Massachusetts, and in so doing, have driven down cost as products, means and methods are continually refined through experience and volume. The regulatory staff and subcontractors employed by EEA have been smart, engaged, people of good faith diligently exercising their responsibility in the best tradition of public service. Dependable departments run by EEA, taken together with the fact that EEA has not changed the program regulations within a solar program, has established Massachusetts as a dependable place to invest in solar projects and portfolios.

Building on the reputation of Massachusetts having a dependable solar program, the basic structure of the current SMART program is highly scalable and with minor adjustments could support Massachusetts solar efforts well through 2050. While the SREC I and SREC II programs could be described as a learning curve in developing a nascent industry, the SMART program should have built on that experience. Despite its potential and strength, the SMART program has fallen short due to a lack of commitment.

The 2030 CECP Informed by the 2050 Roadmap

Unfortunately, after six years in office, the first sentence in Strategy E4: Continue to Deploy Solar in Massachusetts seems to capture the attitude of the Baker-Polito Administration.

"The Commonwealth's current solar programs are anticipated to sunset after 2025, but the state and region will need to steadily continue to deploy solar generation over the next three decades to meet anticipated increased electricity demand in 2050."

The 2030 CECP vision statement by EEA, almost boastfully, intends to end the solar program in Massachusetts with no replacement in mind. The 2050 Roadmap and 2030 CECP are loaded with both direct and indirect references that Massachusetts will do wind and the other states in "regional cooperation" will do the heavy lifting with solar development.

Politically, Governor Baker can say he developed a solar program that builds twice as much as the previous administration at half the cost. But the lack of commitment behind the solar program has cost thousands of jobs in Massachusetts.

The 2050 Roadmap and the 2030 CECP both read as if the third-party expert Cadmus, at a project kick-off meeting, was told Governor Baker loves wind, Canadian hydro and he does not like solar so, Cadmus, write your conclusions based upon those assumptions.

Almost imperceptivity, the 2050 Roadmap builds a case against solar in Massachusetts.

2050 Roadmap - Energy Pathways, Page 11

- High population density leading to difficult resource siting.
- Significant interties with a large-scale hydro-electric system (Hydro Quebec);
- Large offshore wind potential
- Moderate solar resource quality

2050 Roadmap - 2030 CECP Page 41

"Considering the regional nature of electricity markets, overly constraining the development of ground-mounted solar in Massachusetts would likely cause this demand to simply leak across the Commonwealth's borders."

2050 Roadmap - Energy Pathways, Page 90

"For example, this study's results show clear patterns of resource specialization within ISO-NE - Massachusetts building offshore wind while Vermont and New Hampshire build solar, with mutually beneficial trade among them taking advantage of resource diversity."

2050 Roadmap - Energy Pathways, Page 89

"Having greater regional coordination, as in the Regional Coordination pathway, reduces land requirements within Massachusetts by about 20%, though it increases land requirements elsewhere. A policy emphasis on rooftop solar development, as in the DER Breakthrough pathway, can cut the land requirement for solar in half."

Regional Cooperation:

Throughout the 2050 Roadmap and 2030 CECP, the concept of regional cooperation is emphasized in all scenarios to affect wholesale market, the management of the grid by ISO-NE, and transmission and renewable generation resource development.

As indicated above, Massachusetts is presenting itself as a state which because it is a more densely populated state, it is therefore, by definition, more difficult in which to site and develop ground mount solar.

What will other states think when they "look under the hood" of Massachusetts solar regulations and find that in 2018 a "Greenfield Subtractor" was put in place to discourage solar development specifically. In 2020, the same year as the 2050 Roadmap and 2030 CECP, EEA through DOER doubled down and increased the Greenfield Subtractor to make greenfield solar projects uneconomic and without a public hearing, specifically excluded solar development from all BioMap2, Core Habitat and Critical Natural Landscape parcels of land. The lands included are all public lands and 30,000 privately-owned parcels greater than four hectares. (9.88 acres)[1]

Any kind of development can take place on those parcels of private land, only solar development is specifically excluded by regulation.

The combination of the Greenfield Subtractor and the BioMap2, Core Habitat and Critical Natural Landscape excludes over 64% of land in Massachusetts which is forested.[2]

How would the voters and legislators of Maine, VT and NH feel about participating in "regional cooperation" if they knew that Massachusetts was keeping its lands **pristine** but could not care less about their equivalent BioMap2, Core Habitat and Critical Natural Landscape areas to accommodate new transmission lines[3] and 200-300 MW solar fields to benefit Massachusetts? Is this the kind of preplanned goodwill that is supposed to leak over the border?

Given that the electricity demand in each state is projected to more than double by 2050

[1] Land Sector Report, A Technical Report of the Massachusetts 2050 Decarbonization Roadmap Study, December 2020, Page 11

[2] Land Sector Report, A Technical Report of the Massachusetts 2050 Decarbonization Roadmap Study, December 2020, Page 7

[3] Interim Climate and Clean Energy Plan, Strategy E2: Develop and Coordinate Regional Planning and Markets, December 30, 2020, Page 38

due to the "widespread electrification of the building and transportation"[4] sectors, each state should first focus on installing solar and other renewables within its own state before it reaches out to other states for additional renewable generation.

Is Massachusetts using its third-highest per capita income[5] in the United States to push around its less affluent northern neighbors? (NH 9th, VT 19th and Maine 31st) We need their goodwill to accomplish our energy security, as well as our clean energy and climate goals.

Sequestration, Land Use

We acknowledge that in-state carbon sequestration is an important calculation in Governor Baker's 85% net zero by 2050 from 1990 emissions levels.

Massachusetts has 5,019,113.6 acres of land[6] to which 3,702,718 consist of all-natural cover[7] of which 3,000,000 acres are forested[8] and slightly greater than 10% of that number (or 325,449 acres) represent 163 Final Core Forest areas.

The BioMap2 total of 2,029,200 acres that DOER has inserted into the regulations represents 40% of the state land mass[9].

One megawatt of installed solar PV will consume 5 acres of land or less, depending upon shading, slope or obstructions. One thousand megawatts (1GW) of ground-mount solar PV would consume 5,000 acres (5-acres x 1000 MW) of land or less. In ten years, that total would be 50,000 acres or less, especially as density of watts per panel continues to increase.

At an installation rate of 1 GW[10] per year, it would appear that devoting 0.000996 percent of the land per year for solar development within Massachusetts, as potentially enabled in Chapter 40 Section 9B: Solar Access, to accomplish the legislated global warming emission reduction requirements would not be a burdensome intrusion of local control; particularly if larger scale solar development had a fifty-foot (50') treed buffer protecting sight-lines of local roadways and abutting lots.

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[4] Interim Climate and Clean Energy Plan, Strategy E2: Develop and Coordinate Regional Planning and Markets, December 30, 2020, Page 36
[5] https://www.statista.com/statistics/303555/us-per-capita-personal-income/
[6] https://www.answers.com/Q/How_many_acres_of_land_in_Massachusetts

[7] BioMap2 Technical Report – Building a Better BioMap, Supplement, Mass Fish & Game, November 2011, Page84
[8] BioMap2 Technical Report – Building a Better BioMap, Supplement, Mass Fish & Game, November 2011.
Page 63 with Table 28 on Page 62
[9] [9] BioMap2 Conserving the Biodiversity of Massachusetts in a Changing World, Mass Fish & Game 2010, Page 4 Executive Summary, Chart

[10] Brattle Group, Achieving 80% GHG Reduction in New England by 2050, Executive Summary, Page v, (Massachusetts has 45% of ISO-NE load, at a minimum, MA share is 1 GW per year.

One GW per year for thirty years would equal three percent of Massachusetts total land area or 158,000 acres.[11] This dedication of land for in-state renewable energy solar development would not be a threat to the 163 Final Core Forest Areas[12] totaling 325,449 acres located throughout the Commonwealth. The 163 Final Core Forest Areas are identified and could be specifically excluded from solar development by regulation.

Solar development on 158,000 acres is not a threat to the sequestration calculation, particularly since EEA does not control the privately held 30,000 lots greater than 9.88 acres which are not restricted from being developed for any other permitted use.

Net vs Gross Sequestration Calculations:

EEA should review the gross 1990 emissions levels and make public a balancing equivalent that plainly explains the calculation to 85% net zero by 2050 from 1990 emission levels. The information found may further inform the implementation of the 2050 Roadmap and 2030 CECP policy.

If Massachusetts requires large amounts of land to meet its sequestration number, rather than foist solar on other states, in the interest of "regional cooperation" the Commonwealth, through a land trust mechanism, could acquire land in other states to be held in permanent conservation under the management of the Commonwealth designee. The land could be purchased in areas where Massachusetts residents frequent for recreation or along yet-to-be built transmission corridors to be held in permanent conservation.

Atlantic Flyways and Insect Pathways:

The states in New England are on the same avian and insect flyways. We continue to lose species habitats due to anthropogenic activities. Part of the reason for the Greenfield subtractor and BioMap2, Core Habitat and Critical Natural Landscape prohibition was the effective lobbying by certain stakeholders to stop solar development particularly in the 30,000 privately held lots that EEA does not control under the auspices that birds and insects needed the forest to survive. Using this species protection argument does not carry any weight when the solar development as currently called for in the 2030 CECP and 2050 Roadmap is foisted on to another state in the same avian and insect migration pathway. See Exhibit 3.

Mitigation vs. Prohibition:

Converting 1 GW or 5,000 acres of land per year to active species habitat mitigation through solar development would be better than converting the same portion of the 30,000 lots greater than 9.88 acres that are not controlled by the state to permitted use

[11] Energy Pathways to Deep Decarbonization, A Technical Report of the Massachusetts 2050 Decarbonization Roadmap Study, December, 2020, Page 88

[12] BioMap2 Technical Report, A Supplement to BioMap2: Conserving the Biodiversity of Massachusetts in a Changing World, Table 28. Final Forest Core selection, after post-processing, Page 62

development. If a solar developer wants to cut trees in a wetland to remove shade from the solar array, the solar developer replants alders not only to soak up moisture but also to provide habitat for migrating bird species. As an example, solar policy would require and pay for, the planting of milkweed for monarch butterflies and low grow bushes that bloom and grow berries for bird species while providing habitat for breeding. There will be those that say, "What does this have to do with energy policy?" But the answer is climate change and species habitat loss are direct results of anthropogenic activities. If properly structured, solar development could be a partial solution to the habitat loss problem.

To give some scale as to the reality that the 30,000 private lots will be under pressure, single family residential housing is anticipated to more than double by 2050 to total 500 million square feet of building space, 323 million square feet of that to be built by 2030.[13]

2050 Roadmap and 2030 CECP Reliance on Rooftop Solar:

Building Sector Report:

DER Breakthrough: This pathway explored cost reductions for distributed energy resources and resulted in high levels of rooftop solar (17 GW vs 7 GW from *All Options*), together with more behind the meter storage and flexible load, including vehicle-to-grid charging.[14]

The vision statement of the 2030 CECP on Page 40 states that "The Commonwealth's current solar programs are anticipated to sunset after 2025." If that is the case, how does EEA intend to accomplish all of the solar in the 2050 Roadmap? It has taken 10 years to install a little less than 2.5 GW.[15] What vision does EEA have today to accomplish the goals of the 2030 CECP?

Components Unique to Rooftop Solar:

EEA appears to place too much reliance on installing solar on 1-in-3 and 3-in-4 roofs[16] coupled with the useful life retirements approach taken in the 2050 Roadmap[17] as the preferred method of making the transition renewable investment.

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[13] Building Sector Report, A Technical Report of the Massachusetts 2050 Decarbonization Roadmap Study, December 2020, Table 3. Projected Residential Growth by Decade in the Building Sector, Page 28

[14] Building Sector Report, Page 11

[15] Energy Pathways to Deep Decarbonization, A Technical Report of the Massachusetts 2050 Decarbonization Roadmap Study, December 2020, Page 84

[16] Energy Pathways to Deep Decarbonization, A Technical Report of the Massachusetts 2050 Decarbonization Roadmap Study, December 2020, Page 84

[17] Energy Pathways to Deep Decarbonization, A Technical Report of the Massachusetts 2050 Decarbonization Roadmap Study, December 2020, Page 29

1. **The roof either needs to be less than 5 years old to have a 25-year solar system placed on the roof or be ready for replacement.**

   Most commercial roofs have roofing systems that with normal maintenance will last thirty (30) years or more. A vast number or residential roofs have 30-year architectural shingles. Solar industry standards are for an 80%-84.95% production guarantee at 25-30 years with most Tier 1 solar panels.

   Contractually placing a 25 to 30-year asset on anything greater than a 5-year-old roof is not a good idea and will cause solar industry reputational damage that will impede the progress of the 2050 Roadmap goals.

2. **The roof needs to be capable of carrying the load of the solar system.**

   Not all roofs are solar ready as the original design was for snow and mechanical system loads only.

3. **The owner of the real estate asset needs to be willing to have solar on their roof.**

   For commercial and industrial buildings, this is a big deal. Some companies have policies prohibiting solar on their roofs as a financial or operational risk management strategy.

   Actual experience: After considerable effort, we finally achieved a meeting with the CEO of a large shopping mall complex. At a high level we estimated we could place enough solar on his roof to provide his company with $200,000 per year in roof lease revenue for 20 years. The CEO's response: "I do not want your solar on my roof because if my tenants want that roof space, that is more valuable to me."

Components That Need to Happen Simultaneously to Have Any Kind of Solar Installed

1. **A solar program capable of being financed needs to be in place.**

   EEA through DOER, despite well-designed and well-managed programs, has had difficulty maintaining program availability. For large rooftop solar projects that required interconnection studies, the gap was too long between SREC II and the start of the SMART program. The SMART program first started in June of 2017 and was not active until November of 2018. The SMART program was open for one week and 95% of the National Grid territory capacity was gone due to an SREC II backlog. DOER knew of that backlogged condition. Despite having a 400 MW Review provision, EEA chose to do nothing for one year to start examination of an extension to the SMART program. Revised SMART regulations were being published in April of 2020. The D.P.U. SMART tariff order for those revised SMART regulations remains outstanding and the financeable instruments, the Statements of Qualifications (SOQ), are not being processed, which means that National Grid solar

capacity has not been available from the summer of 2019 until today, March 19, 2021.

We are stunned that the 2030 CECP does nothing to inform the public, the solar industry, DOER, and D.P.U. as to how EEA is going to deliver real renewable energy results.

"Since wind and solar generation, (are) the least-cost forms of electricity supply",[18] why is EEA not utilizing solar development as the fastest deliverable form of renewable energy?

Since the current SMART program is **again** is headed for uneconomic conditions, particularly in National Grid territory, EEA should start a new review of SMART that would begin in 2022 and commence a 500 MW per year build rate for all types of solar from 2023 to 2025 and rising 100 MW per year from 2026 – 2030 until 1 GW of solar is reached by 2030.

2. Interconnection Needs to be a Clear, Timely and an Affordable Process.

The 2030 CECP needs to inform the interconnection and Grid Mod dockets. As written, neither the 2030 CECP or the 2050 Roadmap informs D.P.U. 19-55, D.P.U 20-75, the group study nor Grid Modernization dockets because a fixed level of solar and other DG to be interconnected per year is undefined.

Owners of commercial roofs expect action. If Owners are told it will take 6 to 9 months to receive an ISA, those owners expect delivery of that ISA. If the delay in receipt of an ISA pushes the solar project to a lower compensation block, the project will most likely be killed by these conditions. A solar developer is unable to close a contract with a commercial roof owner if the cost of interconnection and solar program compensation are not known or take too long to be determined.

The inability of Massachusetts to have both solar program and interconnection availability at the same time inhibits the achieving of 2050 Roadmap goals.

A designated annual DG interconnection and build rate will inform the interconnection and grid modernization process.

3. **Municipal Governments** and authorities having jurisdiction need to be on the same page as state agencies as solar, storage and renewable goals are rolled out. Our anecdotal experience is that municipal authorities see inconsistencies in laws and policies and expect things to continuously change.

[18] Energy Pathways to Deep Decarbonization, A Technical Report of the Massachusetts 2050 Decarbonization Roadmap Study, December 2020, Page 52

4. **Solar Developers, EPCs and other DG Related Business Need to Have a Framework to Actually Be in Business to Execute 2030 CECP Goals.**

Choppy solar policy implementation between solar programs combined with interconnection difficulties have caused the very kinds of companies that the 2030 CECP and 2050 Roadmap need for policy execution to leave Massachusetts or to leave the business. Choppy, poorly-defined solar policy does not promote the long-term interest of the public. An example:

When you have a company that is a Massachusetts-based, vertically-integrated design-build solar developer, that has installed over 200 MW of rooftop solar projects, that needed to lay off over 100 field personnel and 19 highly skilled staff employees and to shrink the organization to a single principal to stay in business due to delays in SMART availability and interconnection delays, that is a failure in EEA solar and DG policy implementation. How is the Commonwealth to achieve its 2030 and 2050 Roadmap goals without a declared, decade-long solar, storage and wind program?

Energy Pathways on Page 89 gives a nod to the value of "frontloading some of this solar build could be a good strategy for the state, as a way to develop the industry, develop the ability to site these resources, and reduce pressure on imports in the near term."

Developing significant solar installed capacity in 2022 and beyond would provide the **installed, interconnected infrastructure** to be ready for the DER technology Breakthrough which will now provide the added value in 25 years to repower those installed systems and keep that land designated for renewable energy generation.

Land values in the Commonwealth will not remain static and land upon which solar and other renewable resources are located will be in economic competition with other land uses. EEA needs to keep in mind a means of keeping prior solar program projects interconnected.

DER Breakthrough:

In one sense the DER Breakthrough concept is a fact that in 20 years there will be new technology that is better than it is today. But improvements will be throughout the building, transportation, sequestration, storage and energy sectors, not just the generation sector. Undoubtedly, our expectations will rise as to what is possible and Massachusetts will legislate to achieve those possibilities.

For scale purposes, in 2011, the best commercially competitive technology was solar panels at 290 watts per panel. Today, an increasing number of solar panels are bifacial and the watts per panel is approaching 600 watts per panel. If an average improvement rate of 30 watts per panel per year continued for 20 years, the difference would be

significant, but it would not be so significant that it would change solar policy and its effect on the land. The interconnection of generation and renewable assets is the critical path. Repowering of already interconnected systems should be the focus of the 2050 Roadmap staring with implementation in the 2030 CECP.

In another sense, the DER Breakthrough as described in Figure 40 is punting the responsibility to another administration. It is an undefined catch-all of solar capacity that is currently being quietly designed to be pushed out of state. How can EEA expect to accomplish installing 900 kW to 1.3 GW per year when EEA has been unable to install 3,600 MW in 10 years? EEA needs to revise the SMART program in 2022 and educate ratepayers on the economic benefits of the transition to renewables as indicated below.

Economic and Health Impacts Report, Page 5:
"For example, the least-cost pathways (All Options, Regional Coordination, and DER Breakthrough) all experience returns in terms of economic output that are greater than three dollars per dollar spent – levels that are higher than direct investment in impacted industries because such investment reduces the need for, and total cost of, energy imports. Approximately 472,000 job-years[1] are created by investment in the benchmark decarbonization pathway (All Options) over the course of 30 years, translating to an average of 15,000 jobs annually. "

Changes to Make 2030 CECP Long-term Investments Less Costly:

There are two components of cost that need immediate attention.

1. Long-term utility grade infrastructure needs to have its own tariff at D.P.U that reflects the 30, 40 and 46-year life of wire upgrades, substations, transmission lines, transformers and like equipment.
2. Tax-Exempt financing needs to be applied to utility upgrades to meet the 2050 Roadmap goals. The concept of a "public good" is already established an example of that is the National Grid undersea transmission cable from Nantucket to the mainland. It was financed under a specific program under the IRS code. To be widely accepted, it may take like-minded Governors to reach out to the White House and Congress to add upgrading infrastructure to deal with global warming as it will benefit all states. For example: Texas could pay for winterizing its infrastructure with tax-exempt funds.

Paying for 40-year life assets with 2% or 2.5% debt is a lot more affordable than paying for those improvements on a ten (10) year amortization schedule currently under tariff.

We have worked with Mass Development and tax counsel recommended by them, but neither party was willing to take position without greater state Executive branch engagement.

In our D.P.U. 20-75 comment letter to on December 17, 2020, we identified the fact that 36-year equipment assets under “Structure and Improvements” were aggregated with other shorter-term cost resulting in a 10.198 depreciation rate per year.

The cost to upgrade our grid system is going to be so enormous that we need to pay for short-term assets and cost on their own schedule and leave longer-term assets with a larger cost structure on their own tariff schedule.

Below is a filing by the AGO in D.P.U. 18-150 Performance-Based Ratemaking Proposal, September 30, 2019. The depreciation rate is 10.198% per year while Line 7 is 2.5% per year.

Weighted Average Depreciation Rate for General Assets, 1996

General Assets (In Thousands of Dollars)	Value [1]	% of Total Value	% of Net Value	Lifetime [2]	Declining Balance [2]	Depreciation Rate
Land and Land Rights	$489,443	1.96%		NA		
Structure and Improvements	$7,085,330	28.35%	34.20%	36	0.89	2.5%
Office Furniture and Equipment	$3,744,952	14.99%	18.08%	14	1.65	11.8%
Transportation Equipment	$2,436,285	9.75%	11.76%	9	1.73	19.2%
Stores Equipment	$182,280	0.73%	0.88%	16	1.72	10.7%
Tools, Shop and Garage Equipment	$1,006,533	4.03%	4.86%	16	1.72	10.7%
Laboratory Equipment	$800,097	3.20%	3.86%	12	1.62	13.5%
Power Operated Equipment	$589,718	2.36%	2.85%	16	1.72	10.7%
Communication Equipment	$4,871,143	19.49%	23.51%	11	1.65	15.0%
Miscellaneous Equipment	$371,834	1.49%		NA		
Other Tangible Property	$3,412,124	13.65%		NA		
Total Value	**$24,989,739**	100.00%	100.00%	**20**		**10.198%**
Unknown Life	$4,273,401					
Net Value	$20,716,338					
Percent Unknown	17%					

[1] Source: EIA, Financial Statistics of Major Investor-Owned Electric Utilities, 1996

[2] Source: Department of Commerce, "The Measurement of Depreciation in the National Income and Product Accounts", Survey of Current Business (July 1997)

We are assuming the 2050 Roadmap is using the cost structure currently in tariff which will skew their decision-making process on the need to make 40-year upgrade decisions and pay for those costs by 2030.

2030 CECP Provides No Coordination Between Solar, Transportation and Building Utility Upgrades.

Because the 2030 CECP excludes solar, particularly ground-mount solar, from any significant contribution, it only assigns cost to solar and does not look for the benefits solar + storage may generate to support the grid.

On a TSRG conference call, an EDC engineer mentioned that he was not concerned about transmission and distribution as they were now nearly ubiquitous, but he was

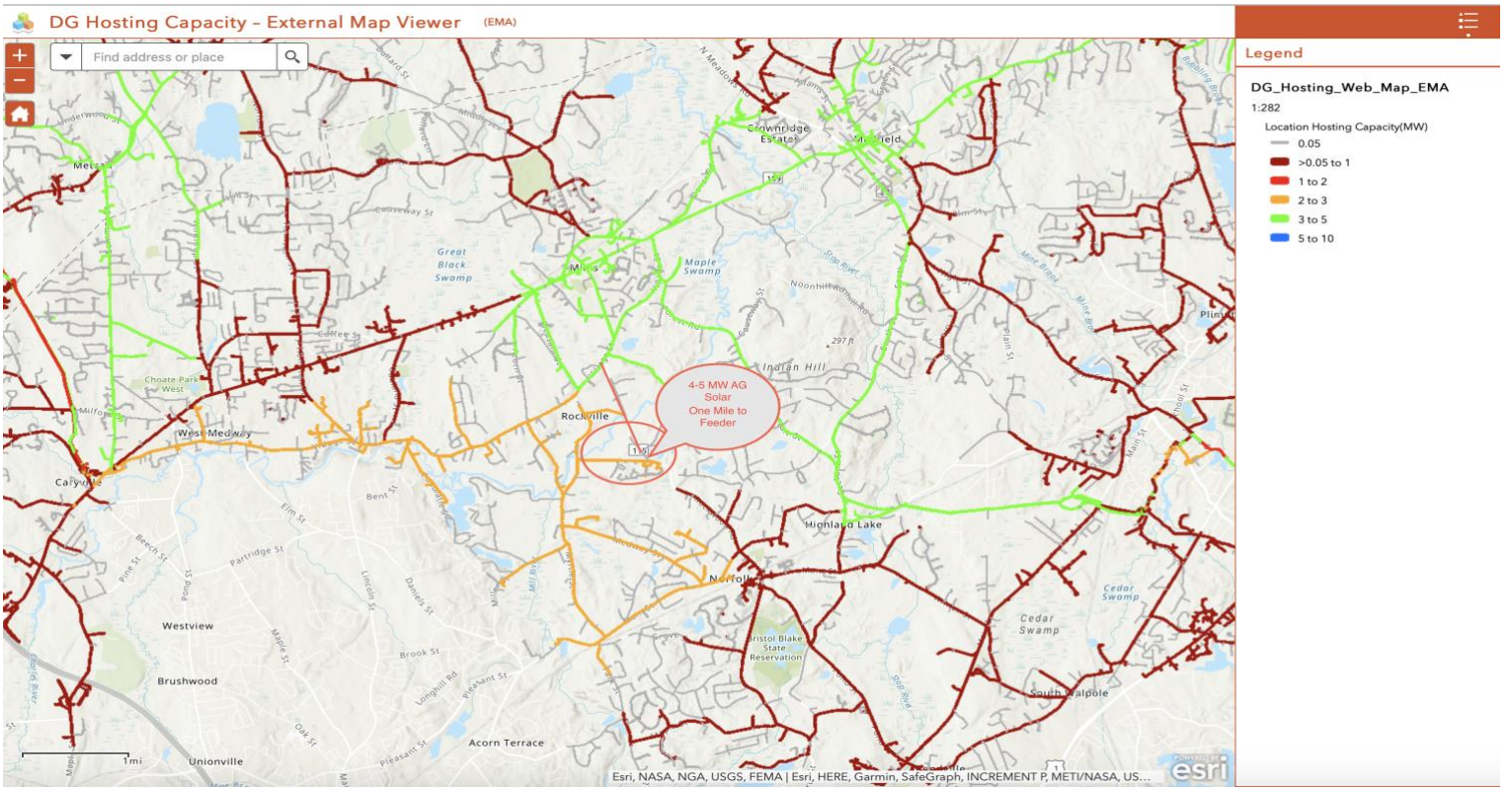
worried about VAR (Volt-amperes Reactive). Every home that has a heat pump will cause a phase shift in power generating the need for VAR or reactive power support.

Solar inverters are able to provide VAR support.

The 2050 Roadmap intends to put one million EV's on the road by 2030[19] and install 100,000 heat pumps or other renewable thermal in homes each year for the next 25 to 35 years[20], the electrical load is scheduled to double[21]. The thermal load on every component on the grid will double as well, requiring the replacement of every feeder, substation and transformer. Solar will contribute to this reinvestment paradigm.

The 4-5 MW Agricultural Solar + storage project, shown below, will provide one mile of feeder upgrade and most likely contribute to substation upgrades as well, by our estimate contributing $1,000,000 in ISA fees or $0.20 per watt AC. Looking below at the DG Hosting Capacity Map from Eversource, would it not represent good policy to have this 4-5 MW solar + storage project provide electricity and VAR support from 4:00 - 8:00 PM to EVs and heat pumps in the homes in this Town?

If solar and wind are the least cost generation, why is solar treated with such prejudice in the 2030 CECP and 2050 Roadmap? Why is it being penalized as a first mover?



[19] Transportation Sector Report, A Technical Report of the Massachusetts 2050 Decarbonization Road Map Study, December 2020, 5.1.2.2 BEV Incentives, Page 30
[20] Building Sector Report, A Technical Report of the Massachusetts 2050 Decarbonization Roadmap Study, December 2020, Sector Wide Considerations, Page 7
[21] Page 36

Recommendations to the 2030 Interim Clean Energy and Climate Plan:

1. EEA should establish a fixed build rate for solar starting in 2023-2025 at 500 MWac per year and rising 100 MW per year until 2030 whereupon 1 GW per year will remain in place until 2040. See the Brattle Group Executive Summary in Exhibit 1. This will inform:
    a. D.P.U in its interconnection and grid modernization dockets.
    b. DOER in its creation of a continued SMART incentive.
    c. The utilities including their stockholders that this transition to renewables is now.
    d. The solar industry that employment will be continuous for two decades and that investing in Massachusetts is long term.
    e. Industry and commercial real estate that solar is not a passing fad.
    f. Municipalities and their local planning efforts.
    g. BBRS code regulators will now have a defined objective to achieve in the drafting and receiving stakeholder input on revised building codes.
    h. Environmental stakeholders that mitigation is the method to protect species on the 30,000 lots larger than 10 acres.

2. EEA should instruct DOER to immediately engage in re-writing the SMART program through 2030 to be in force by January 1, 2023. Then 2040 CECP would start in 2028 so that SMART and all programs to be promulgated will be in force by January 1, 2031.

3. The SMART program would have a ten-year period ending on December 31, 2030 with no program size limits other than to restrict the installation rates other to those listed above. A project that would start development in one year and hit an annual limit would be rolled over into the next year without penalty.

4. The SMART program would have an annual review by a third-party expert engaged by DOER and rates will be administratively set to both protect the ratepayer and to encourage continued development of solar. Rhode Island has employed this method successfully. Adders for targeted sectors like rooftop, agricultural solar, community and low-income solar will remain in place. D.P.U. would need to streamline its tariff approval process to one month.

5. EEA should examine the dynamic of solar + storage systems discharging until 8:00-9:00 PM and then charging with wind power during the evening and discharging in the early morning hours. This notice to the industry will be important in design of a solar + storage system because of current ITC regulations that are in place for the first five operating years requiring solar-originated generation only.

6. Establishing firm, fixed build rates will add a framework which will shape issues such as municipal taxes in PILOT agreements, code enforcement issues on rooftops and wetland mitigation measure with local conservation commissions and DEP.

7. On the 30,000 private lots over 10 acres that EEA does not control, EEA should encourage municipalities to have a 50' treed buffer all surrounding the solar system to remove objections that solar systems are visible at street level on town roads or are affecting an abutters property. We have made this suggestion to municipalities and a sample of which is shown on Exhibit 2.

8. On the 30,000 private lots over 10 acres that EEA does not control and are subject to the development and construction of buildings that are allowed by the permitted-use zoning in the municipality where they are located, EEA should instruct DOER to develop regulations that provide active species mitigation measures as can reasonably applied. The administratively-set SMART compensation would include as a cost of solar development, the cost of installing active avian and insect mitigation measures.

9. EEA should pursue tax-exempt financing for utility infrastructure upgrades for those investments required to meet the renewable objectives of the GWSA and 2050 Roadmap.

10. EEA should instruct D.P.U. to create a tariff that aggregates long-term infrastructure investments with useful lives over 30 years together in one average rate which will be billed to ratepayer's pro rata over a 30-year or greater period.

We appreciate the tremendous amount of time EEA has put into these reports. While we are disappointed by the conclusions reached relative to the solar industry, we are encouraged by the tenor of Undersecretary Chang's remarks on the Zoom call on March 9th and the language in the Interim 2030 CECP that allows for further reflection and review.

We look forward to hopefully a more definitive and declarative plan that sets clear directions for EEA and all stakeholders.

Please reach out should you have comments or questions.

Best Regards,

Doug Pope
President

Pope Energy

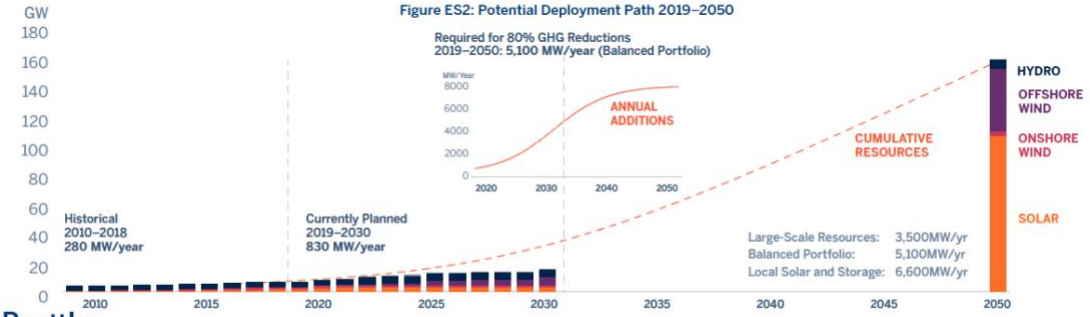
Exhibit 1
Brattle Group, Achieving 80% GHG Reduction in New England by 2050, September 2019

However, adding 800 MW per year through 2050 is not nearly enough. In fact, as shown in Figure ES1, between 2019 and 2050, between 3.5 GW and 6.6 GW of renewable capacity, including 2–5 GW of solar and 2–3 GW of wind, will need to be added each year on average.

Put differently, **New England will need to accelerate annual deployments 4- to 8-fold compared to what is planned for the coming decade.** While that sounds daunting, such ramp-ups are not unprecedented.

As a matter of fact, the acceleration New England needs is in line — if not slower — than the ramp up that wind and solar technologies have seen over the past 20 years. Over that time, annual wind installations globally have grown by over 11% per year on average, and solar PV by close to 41%. By contrast, to reach the 2050 targets in New England, annual installations of renewable projects would need to grow by about 9% per year. The ramp up does not have to happen on day one. Rather, the focus will need to be on mechanisms to keep the collective foot

Figure ES2: Potential Deployment Path 2019–2050



on the clean energy accelerator until annual installations approach a level that sustains an entirely new and significant industry based on renewable energy in the future. Assuming that future growth of energy demand beyond 2050 will be modest and a typical renewable energy project will last 25–30 years, New England would need to replace about 4–5% of our facilities every year, or 7–8 GW of capacity each year, after 2050.

The bottom line is that if New England wants to make good on their greenhouse gas emissions reduction goals, they will need to keep their foot on the clean electricity development accelerator over the next critical decades to 2050. The current pace of adding more solar PV, onshore and offshore wind, battery storage, etc., is simply insufficient. However, if New England keeps growing these new industries at roughly the current rate, the region may have a chance to achieve the commitments made to decarbonize our economies by 2050 and do its part to reduce the risks of catastrophic climate change. And, in the process, it will create a substantial and sustainable new green economy.

Figure ES3: Rate of Growth of Annual Additions

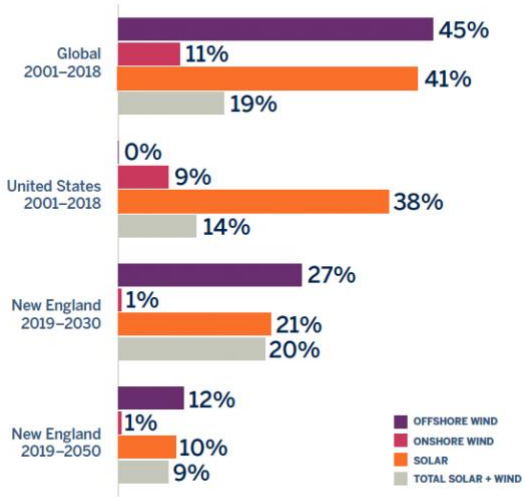


Exhibit 2

Sample of a local zoning change. The local planning board wanted to expand this 50' buffer concept to parcels greater than 15 acres all over town but appreciated the fact that they did not want to get too aggressive and have the zoning change fail at Town Meeting when the original intent was to approve a dual-use agricultural solar project for a family farm.

Sample:

Proposed Amendments to Section XXI of the _____ Zoning By-Law
Large-Scale Ground-Mounted Solar Photovoltaic Installations

The following amendments (in **bold** below) are proposed to the current _____ Zoning By-Law:

1. Amend the definition of "Designated Location" in Section XXI.3 (Definitions):

***Designated Location*:** The location(s) designated herein where Large-Scale Ground-Mounted Solar Photovoltaic Installations with a Rated Nameplate Capacity of 250 kW or more may be sited As-of-Right:
{subject to site plan review}

(a) in the I-P and I-P-2 Districts, as shown on **the Zoning Map of the Town of _____, Massachusetts referenced in Section III.C of this Zoning By-Law, or**

(b) on any lot or grouping of contiguous lots that

(i) is at least 15 acres in total area and

(ii) consists of land

a. that is primarily and directly used for agricultural purposes as defined in M.G.L. c. 61A, § 1; or

b. that is primarily and directly used for horticultural purposes as defined in M.G.L. c. 61A, § 2; or

c. where at least fifty percent (50%) of the total area of the lot or grouping of contiguous lots consists of important farmlands, including without limitation prime farmlands, unique farmland, and additional farmland of statewide importance, identified by the United States Department of

Agriculture Natural Resources Conservation Service.

2. Add a new subsection XXI.9(d) to Section XXI.9 (Dimension and Density Requirements):

9. Dimension and Density Requirements:

The following dimensional and density requirements shall apply to all LGSPI.

Setbacks:

For large-scale ground-mounted solar photovoltaic installations, front, side and rear setbacks shall be as follows:

(a) Front yard: The front yard depth shall be at least 40 feet; provided, however, that where the lot abuts designated Conservation land or land currently used for Recreational purposes, the front yard shall not be less than 50 feet**, and where the lot abuts a Residential District, the front yard shall provide a treed fifty foot (50') wide buffer from all Town roads and residential properties, except as provided in (d) below**.

(b) Side yard: Each side yard shall have a depth at least 20 feet; provided, however, that where the lot abuts designated Conservation land or land currently used for Recreational purposes, the side yard shall not be less than 50 feet**, and where the lot abuts a Residential District, the side yard shall provide a treed fifty foot (50') wide buffer from all Town roads and residential properties, except as provided in (d) below**.

(c) Rear yard: The rear yard depth shall be at least 30 feet; provided, however, that where the lot abuts designated Conservation land or land currently used for Recreational purposes, the rear yard shall not be less than 50 feet**, and where the lot abuts a Residential District, the rear yard shall provide a treed fifty foot (50') wide buffer from all Town roads and residential properties, except as provided in (d) below.**

(d) Subject to application for and receipt of a Special Permit, natural sight barriers (which shall include without limitation rivers, upland gradients, and any wetland setbacks required by the _____ Conservation Commission pursuant to applicable law) may be considered by the Planning Board as a basis for reducing the 50' treed buffer requirement of (a), (b) and (c) above.

3. Amend Section V. Table 1. Use Regulations, Wholesale, Transportation & Industrial, #20 and add footnote 5 to Table 1 Notes:

Principal Uses	R-T	R-S	R-V	R-V-C	C-V	C-V-2	V-B	I-P	I-P-2
20. Large-Scale Ground-Mounted Solar Photovoltaic Installations with Rated Nameplate Capacity of 250 kW DC or more. (Added June 8, 2015)	**N(5)**	**N(5)**	**N(5)**	**N(5)**	**N(5)**	**N(5)**	**N(5)**	P	P

Table 1 Notes: (Amended May 13, 1985) (Amended June 14, 2010) (Amended May 12, 2014)

5. But see Section XXI where, under certain conditions, such solar facilities will be allowed in the district.

Exhibit 3

Atlantic Flyway – US Fish and Wildlife Service