

From: Energy and Climate Action Committee (ECAC)
To: Solar Bylaw Working Group (SBWG), Town Manager, Town Council
Date: February 10, 2023

RE: Analysis and Recommendations on Ground Mounted Solar Siting Capacity

Summary

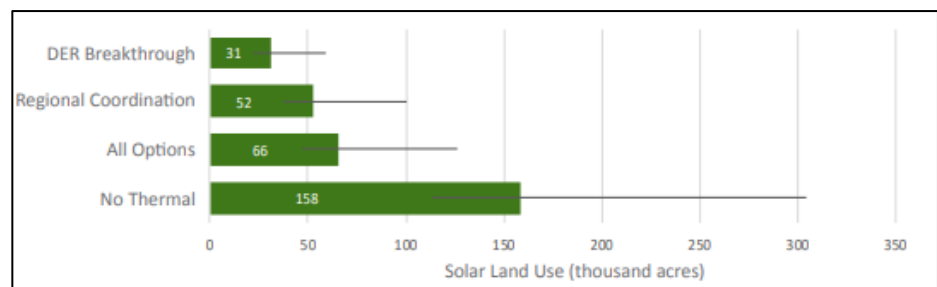
To provide guidance on solar siting and zoning for Amherst, ECAC has completed an analysis to inform the potential need for ground-mounted solar to provide a reasonable contribution to the state projections for ground-mounted solar capacity to meet 2050 commitments to 100% renewable electricity generation.

Our analysis considers the range of ground-mounted solar acreage needed under the scenarios evaluated in the state's 2050 Decarbonization Roadmap, and considers Amherst's share of that amount based on our 0.29% share of the state land area.

From this analysis, ECAC recommends that the SBWG and the town consider the need for between 145 to 290 acres for ground-mounted solar arrays, hosting approximately 36 to 72 MW of solar. This includes the 20 MW of ground-mounted solar already installed or approved between the town-led projects on the landfill and Hickory Ridge, and the two private projects in North Amherst.

Background

As shown in the figure below, the [Massachusetts 2050 Decarbonization Roadmap](#) (page 64) projects that 31,000 to 158,000 acres are needed for ground-mounted solar capacity over its various scenarios. Within the base case scenario (All Options), the most likely projection of 52,000 acres ranges from 35,000 to 125,000 acres based on model assumptions (provided in graph as error bars).



For this analysis, we considered a range of 50,000 to 100,000 acres dedicated to ground-mounted solar arrays in the Commonwealth. This range covers the projected needs of the Commonwealth across key scenarios (No Thermal scenario is a more extreme scenario that assumes no residual thermal generators to serve peak needs). As time moves on this need may increase or decrease depending on changes in the market and technology conditions across all the renewable energy sources.

This state evaluation, and our results for Amherst, considers only the portion of solar that is ground-mounted. The state roadmap separately considers reasonable estimates for solar capacity in smaller systems across the built environment. Amherst too, will want to deploy solar as much as feasible, on its built environment such as rooftops and parking lot canopies. Similar to the

“DER Breakthrough” scenario depicted in the figure above, which assumes greater than anticipated cost reductions and acceleration of smaller behind-the-meter solar installations, Amherst may be able to limit the acreage for ground-mounted arrays. On the other hand, under decarbonization scenarios where offshore wind or large-scale hydro are not available in the amounts presumed, more solar, and ground-mounted solar, are projected.

Analysis

Excluding the University and two college campuses, Amherst’s land area is 22.6 mi², out of the Commonwealth’s 7800 mi², or a 0.290% share. As discussed above, for the purpose of this analysis, a reasonable range for ground-mounted solar acreage needed in the Commonwealth is 50,000 to 100,000 acres. Thereby, given our portion of land, Amherst’s share would be 145 to 290 acres. This share represents 1.0% to 2.0% of Amherst land. Assuming 4 acres per MW of solar installed (which is the case for Hickory Ridge), this acreage would support 36 to 72 MW of solar DC capacity.

Recommendation

ECAC recommends that the SBWG, and others, maintain this scale of ground-mounted solar for Amherst in mind while establishing zoning bylaws. While acreage suitable for solar development will be constrained for other reasons (wetlands, public water supply, slopes, setbacks, etc.), other zoning constraints should be carefully limited so that there is ample opportunity for siting 145 to 290 acres of ground-mounted solar (or 65 to 210 acres beyond our roughly 80 acres already dedicated to ground-mounted solar).