

## **Amherst, Massachusetts: Impediments to Solar Installations on Closed Landfills**

by Robert Hersh<sup>1</sup>

The proposed installation of solar photovoltaic arrays on the closed Amherst, Massachusetts municipal landfill illustrates why municipalities are marketing their landfills, why developers are targeting them for solar power, and how impacted neighbors can delay or prevent such installations.

In Massachusetts the rationale for installing solar arrays on closed landfills is compelling. In a largely urban state, where suitable twenty-acre parcels for large-scale solar installations are scarce, the state's more than 500 closed landfills are attracting considerable interest from solar developers and municipalities. These landfills statewide comprise some 9,000 acres of under-utilized real property. Clearly not all of the 500+ landfills are appropriate for commercial solar due to size or other locational attributes, but 175 of them are 20 acres or larger and many are located only a few miles from high-volume power lines.<sup>2</sup> According to officials from the Massachusetts Department of Environmental Protection (MADEP), some 30 towns across the state have or are currently in the process of issuing requests for proposals to develop their landfills into solar farms. Interest in the development community, according to a state official, "is keen." Solar power on landfills is seen as "the next big thing." The availability of land is only one of the factors driving this transformation.

### **Incentives**

Massachusetts' energy laws and incentives are driving this trend. In particular, the Green Communities Act (GCA) of 2008 reformed the rules that apply to all forms of renewable electricity. The law requires that by 2020, 15 percent of electricity provided by utilities to ratepayers will be supplied by new green power facilities, such as solar arrays, landfill gas, biomass, and wind. Developing solar capacity was a priority in the new law. The legislation requires the state to develop a solar carve-out for renewable energy generators under the existing state Renewable Portfolio Standards. In Massachusetts the target is 400 megawatts of installed solar capacity in the next ten years.

The solar carve out works by requiring utilities to buy a certain percentage of their power from owners of qualifying solar systems—such as municipal solar installations on landfills—through the creation of special solar renewable energy credits (SRECs). The credits have a price floor of \$300 per megawatt hour (Mwh), nearly ten times the price of other renewable energy credits utilities must buy. If utilities are unable to comply with the requirements of the carve-out through SREC purchases, they are required to pay an alternative compliance payment (ACP) of \$550 per Mwh. In other words, the ACP price serves as a price ceiling for the Massachusetts SREC market. In 2011, SREC credits sold for approximately \$530 per Mwh, or 53 cents per kilowatt hour, well above the cost of generating solar electricity.

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<sup>1</sup> Robert Hersh is an associate of CPEO and an Adjunct Associate Professor at Worcester Polytechnic Institute, in Worcester, MA. He can be reached at [hersh@wpi.edu](mailto:hersh@wpi.edu).

<sup>2</sup> Massachusetts Landfill Profiles, available at <http://www.mass.gov/dep/energy/landfill.htm>



### **Amherst Landfill**

SREC credits can be significant for developers. By selling SREC credits to electricity providers, they can turn what previously were borderline projects into ones that are more financially feasible. The sale of SRECs, in essence, shortens the time it takes the developer to earn a return on investment. SRECs, along with federal tax credits for the construction of solar installations and accelerated tax depreciation, have invigorated interest in constructing solar facilities in the state. Massachusetts is one of only seven states in the country that have SREC markets.<sup>3</sup>

### **Amherst Decides**

In May of 2011, at the annual Town Meeting, the citizens of Amherst, Massachusetts, a university town in the western part of the state, voted in support of an article that gave the town manager the authority to lease roughly half of a 50-acre closed landfill to a third-party solar services provider, Blue Wave Strategies, to construct a solar installation that could generate up to

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<sup>3</sup> The other states are Delaware, Maryland, North Carolina, New Jersey, Ohio, and Pennsylvania.

4.75 megawatts of power for the town. This business model is typical for many of the municipal solar farm projects underway in Massachusetts. The solar services provider leases the property (typically for 30 years) and constructs, operates, and maintains the photovoltaic system, while the town through a Power Purchase Agreement purchases the electricity from the provider for a predetermined period.

It can be a good deal all around, particularly for towns without the capacity or financial resources to launch a solar project. In the Amherst example, the solar services provider would cover up-front capital costs, develop the solar array design for the site, negotiate interconnection fees<sup>4</sup> with the utility company, and manage the complex state and local permitting requirements, from stormwater run-off control plans to post-closure monitoring and maintenance plans. The provider benefits because it will be able to sell electricity to the town as well as SRECs to electricity suppliers. In addition to income from electricity sales, the provider can count on various incentives (e.g. tax credits, accelerated depreciation) to generate an appropriate rate of return for the project's investors.

Amherst town officials supported the project for both environmental and financial reasons. The town's elected Select Board had advocated in broad terms for a more sustainable community and were interested in "initiating and advocating new green efforts and programs."<sup>5</sup> The solar arrays, they asserted, would provide the town government with nearly all of its total electricity consumption and thus help Amherst reduce its reliance on fossil fuels and lower its carbon emissions by over 6,000 tons per year, the equivalent of removing 1,200 cars from the road.

At the town meeting, the advocates of the project also pointed to more concrete, financial benefits from the proposed solar installation. Under the negotiated Power Purchase Agreement, the town would pay a stable and significantly reduced rate for electricity, with a cost savings estimated to be over \$25 million over the life of the contract. Moreover, the solar service provider would pay property tax payments on the equipment at the site, amounting to some \$350,000 annually or \$5 million over the 30-year contract.

At the Town Meeting residents questioned city officials on some of the assumptions behind these figures. Some town residents emphasized that the 4.75 megawatts was for peak, not average power generation and that the financial benefits to the town might also be overestimated; others argued that solar panels should first be put on town buildings rather than the landfill. Still others were concerned with the viability of the companies involved, the strength of the financial assurance mechanisms, and how long-term operations and maintenance after the thirty-year contract expired would be handled.

### **Opposition**

But one group in particular, a dozen or so town residents whose homes abutted the landfill, were more vociferous in their criticisms of the solar installation. They formed an organization, Amherst Citizens for Responsible Solar (ACRES), put together a website, and

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<sup>4</sup> Interconnection refers to the technical aspects of connecting the solar generator to the electric power system.

<sup>5</sup> Memo, May 11, 2011, Town Manager John Musante to Town Meeting Members

sought to influence the town meeting vote. Their arguments against the solar installation fell into three categories. First, on technical grounds, they argued that the weight of the installation would compromise the already damaged landfill cap and lead to greater water percolation and higher leachate levels flowing from the landfill into nearby wetlands. They also claimed that the solar panels would act as a giant wing: As wind speed and wind direction changed, the panels would “lift and release” the clay cap, eventually causing the cap to crack and fail.



**Amherst Landfill and Adjacent Homes**

Second, the group pointed out that according to a 2009 state-mandated Comprehensive Site Assessment of the landfill conducted by an engineering firm and submitted to MADEP, a mass water balance model estimated that some 940 gallons/acre/day of leachate are produced by precipitation infiltrating through the cap. This effluent, the group argues, “flows westward and causes elevated levels of lead, mercury, arsenic, copper, iron and cyanide” that exceed water quality standards.<sup>6</sup> The solar installation, the group argued, would prevent much needed improvements to the clay layer of the landfill for thirty years.

And third, the citizens’ group argued that the town violated the terms of a grant from MADEP that helped fund the construction of the cap over the landfill in the late 1980s and restricted the use of the landfill to recreation. The agreement included the condition, “The town will, within six months of signing this agreement and prior to submitting a request for final

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<sup>6</sup> See <http://www.area-group.org/cap.html>.

payment, record at the appropriate registry of deeds a deed restricting any future uses of the landfill site to active or passive recreation.”<sup>7</sup> Town officials have claimed that a deed restriction for the property was never filed, so no such deed restriction exists. A month after the town meeting, the citizens’ group filed a lawsuit against the town, charging that the construction and operation of a solar array is not a recreational use. They charged that the defendants “are attempting to take advantage of their own lack of compliance with the Grant agreement by taking the position that use of the landfill is not restricted because the deed restriction was not filed.”<sup>8</sup> The lawsuit has not yet been decided by the Hampshire County Court, and the project, which originally had a May 2012 completion date, has not yet broken ground.

It has been argued in the local press and in other venues that the citizens’ group, having lost the vote at town meeting, is seeking any means possible to derail the solar project. As one town official put it, “‘When the political side is exhausted, there’s always the legal option of a delay that is much more costly to the developer than it is to [the neighbors],’ he said. ‘That’s all that’s left to them, and the collateral damage is not important to them.’” Advocates for the solar project see ACRES as motivated largely by NIMBY<sup>9</sup> concerns. Indeed, landfill neighbors literally do not want solar panels in their extended backyards. They are concerned with possible glare from the installation, potential declines in property values, and the loss of open space.

ACRES’ technical claims about the static loads and wind loading are exaggerated. For example, town officials have countered ACRES by noting that the engineering of foundations for solar systems on landfill caps takes into account landfill settlement and side-slope stability, and typically the cumulative weight of the solar installation is designed in consideration of the depth of the landfill cap, waste characterization (e.g. compaction), and the side-slope measure, among other factors. Similarly concern about wind loading can be addressed by installing panel mounting structures with high load ratings.

Town officials also responded to ACRES’ claims about health risks from effluent emanating from the landfill by describing the extensive network of groundwater monitoring wells and surface water sampling locations. The results from testing ordered by MADEP indicate that there are no significant risks to human health or public safety posed by the landfill. Town officials and advocates for the project also point out how the solar project would have to satisfy rigorous MADEP permit requirements, including post-closure use design plans, stormwater drainage plans, landfill gas control and monitoring plans, geotechnical stability and settlement analysis, environmental monitoring description, post-closure maintenance plans, wetlands protection plans, and so forth.

Yet for ACRES members the solar project is not only misguided technically, but it goes against what they claim they were told by the town when they bought their homes near the landfill: The only permitted post-closure use of the landfill was for light recreation use. If the

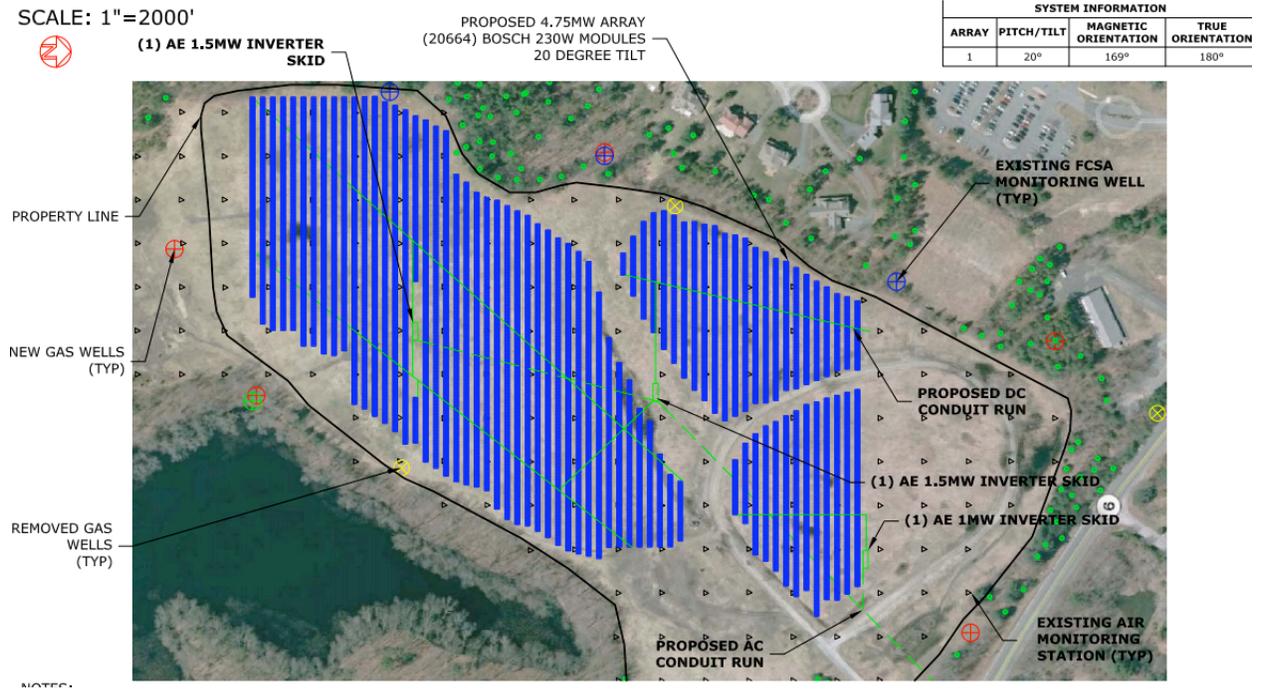
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<sup>7</sup> Nick Grabbe, *Amherst Bulletin*, <http://www.gazettenet.com/2011/06/17/suit-could-hurt-solar-project-official-says-neighbors039-actions-called-delay-tactic>

<sup>8</sup> Diane Lederman, *The Republican*, June 6, 2011, [http://www.masslive.com/news/index.ssf/2011/06/amherst\\_residents\\_file\\_suit\\_ag.html](http://www.masslive.com/news/index.ssf/2011/06/amherst_residents_file_suit_ag.html)

<sup>9</sup>NIMBY is an acronym for Not In My BackYard

project were to move forward, they argue, their homes would be abutting one of the largest solar installations in the state.



### Planned solar installation

This case study suggests that constructing solar installations on landfills, like other, less desirable land uses, may involve a clash of values. Despite the economic and environmental advantages of the proposed Amherst solar farm, it might never be built. While arguments to expand solar energy on underutilized properties have appeal on many levels, the Amherst example suggests that area-wide political will may be impeded by the unwillingness of individuals to accept what they consider sacrificing their private interests to the common good.