

An Old New England Town Lights the Way with Solar

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The U.S. Environmental Protection Agency (EPA) recognizes the overall benefit of siting renewable energy projects on contaminated properties. Through the RE-Powering America's Land Initiative, EPA is encouraging renewable energy development on current and formerly contaminated lands, landfills, and mine sites. This case study highlights a successful renewable energy project on a closed landfill, including information on how key challenges were addressed.

Finding Treasure in a Trash Site

In 2010, representatives in the town of Scituate, MA, sought to find a productive use for its defunct town landfill. After considering recreational uses such as baseball fields, the town decided a solar photovoltaic (PV) installation would be the most viable and cost-effective use of the site, turning a cost center into a source of revenue.

After issuing a request for proposal (RFP) and conducting multiple interviews with respondents, Scituate representatives selected Brightfields Development, LLC (Brightfields), a Wellesley, MA, developer. Brightfields worked with the town, National Grid (utility), and others to tackle challenges and ensure the installation met a multitude of stakeholder objectives, such as cost savings for the town and alignment with the community's environmental interests. The Scituate Landfill is now home to a 3-megawatt (MW) PV installation that, in combination with a nearby wind turbine, provides Scituate with 100% of its municipal power needs from renewable sources.

Property History

Turning a Cost Center into Revenue

Scituate is tucked into the southeastern tip of the greater Boston area, about 23 miles from the city and bordered on the east by the Atlantic Ocean. Incorporated in 1636, the Plymouth County town is now home to 18,000 people and is primarily residential.

Scituate's town-owned landfill operated from 1976 until 1999, accepting a combination of municipal solid waste, construction debris, and residuals from a nearby wastewater treatment facility. In 2000, the municipal landfill was capped and a trash transfer station was constructed on the west portion of the property.

Once the site was capped and confirmed compliant with Massachusetts Department of Environmental Protection (MassDEP) standards, the town began investigating ways to return the land to productive use. The site was deemed inappropriate for



Scituate Landfill solar installation (August 2013). Courtesy of Google Earth

SCITUATE SOLAR LANDFILL AT-A-GLANCE

- Scituate, MA (www.scituatema.gov)
- Former 29-acre municipal landfill
- Capped and covered with soil layer
- 3 MW solar PV installation on 12.5 acres (panels cover 6.1 acres)
- 10,560 polysilicon panels
- Expected \$200,000 annual savings for town from net metering; T&D plus energy value
- Project will produce 3.825 million kilowatt-hours per year
- Land lease to developer: \$1/year
- PPA price: 8.4 cents/kWh plus escalators; developer retained the SRECs
- All project labor was local

"The most important issue was finding a developer with the experience, credibility, permitting expertise, and ability to obtain financing. We didn't select the lowest cost provider, but we did select the one we felt had the best chance of seeing the installation through to completion."

—Al Bangert, Scituate Department of Public Works

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recreational uses, but had several characteristics that made solar a good technical fit, including being a relatively flat, unshaded site that sloped southward and was out of the view of residential neighborhoods.

Nonetheless, town officials were initially hesitant to pursue a solar project because they believed the cost would be too high. However, the volunteer committee evaluating options felt it important to at least investigate solar because it aligned with the town's commitments to the environment and renewable energy. The RFP response prices were more competitive than expected, with proffered Power Purchase Agreement (PPA) prices in line with those of the town's wind turbine. To ensure the selection of a sufficiently experienced and credible developer that would see the project to fruition, the town pared down RFP responses based on qualitative factors before reviewing price estimates. The town eventually selected Brightfields. Brightfields offered the town an 8.4 cent/kWh PPA price through Main Street Power, with Brightfields retaining the solar renewable energy credits (SRECs). Brightfields is also affiliated with Renova Partners, a national brownfields investment and development company.

In addition to selecting a qualified developer with relevant experience, Scituate officials also benefitted from MassDEP's support. Local officials indicate the state agency was proactive in supporting the required post-closure permits, and responded quickly to draft documents and inquiries with thorough and helpful feedback. The project sponsors submitted an application and supporting engineering documents in May 2011 to MassDEP for a "Post-Closure Use Permit" (which is required for any closed landfill that is being re-purposed for other uses). MassDEP issued the necessary permit in September 2011.



Scituate Landfill solar under construction. Courtesy Brightfields Development LLC

Moving Ahead and Tackling Roadblocks

The development team did a full site evaluation to understand and document the existing site conditions. Brightfields and the town together worked out an allocation of potential liabilities associated with the site. As part of its contract with Brightfields, the town acknowledges that it retains responsibility for the landfill and operation of its gas extraction system. Brightfields will be responsible for any issues that may have been caused during the installation, and remains responsible for issues resulting from operations and maintenance of the solar array.

"Renewable energy on brownfields is such a perfect fit. It takes land with few or no options for constructive or economic reuse and turns it into a long-term environmental and economic win."

—John Hanselman, Brightfields Development LLC

While site conditions and liability were addressed in the full site evaluation and lease agreement, the installation encountered roadblocks, beginning with connectivity issues to the grid. The initial evaluation indicated the project would be a fairly simple interconnection to a three-phase distribution line adjacent to the site. However, the circuit to which the solar array would connect

already hosted the town's wind turbine at the nearby wastewater treatment site. National Grid was concerned about the capacity of the existing 10 MW 13.8-kilovolt (kV) distribution line to manage up to 5 MW of variable power without risk to circuit integrity. Utility officials initially estimated upgrades of as much as \$900,000 would be needed to accommodate the solar PV system.

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Rather than cancel or revise the project, Brightfields worked with National Grid to research the concern and see whether it could be addressed in other ways. Using studies from the U.S. Department of Energy's National Renewable Energy Laboratory and other data, Brightfields and National Grid conducted extensive modeling and analysis. By modeling the two production cycles, the team determined the wind and solar would actually complement one another in terms of time of energy generation, and that the anticipated impact on the area grid was not a major factor. Good communication and collaboration between the utility and the developer resulted in the interconnection being completed with minimal upgrades.

"The town initially pursued this installation for the revenue it would generate, but the bigger payout turned out to be the reputation it garnered and the positive perspective in the community of doing the right thing for the environment."

—Al Bangert, Scituate Department of Public Works

The second roadblock Brightfields faced was financing, primarily because of the way in which Massachusetts' SREC market had evolved. In Massachusetts, as in most other states with Renewable Portfolio Standards (RPS) requirements, utilities purchase SRECs to meet state-mandated RPS solar carve-out requirements. Brightfields based its original financials for the Scituate project in part on the assumption that SRECs generated by the project would be worth at least \$285, in accordance with the floor price set by the state's Department of Energy Resources Solar Credit Clearinghouse Auction. However, a secondary market evolved for the Massachusetts SRECs, with utilities choosing to buy SRECs only one year forward. As a result, SREC prices were driven substantially lower than expected. This changed the financial assumptions of the Scituate project and forced Brightfields to seek a new financial partner.

Brightfields worked with the town to secure project extensions on its contractual deadlines while it sought new financing. To help town leadership assure residents it was holding the developers accountable to see the project through, while simultaneously reconfirming Brightfields' commitment to the project, Brightfields and its financial partner Syncarpha Capital submitted a \$109,500 security deposit from which liquidated damages were subtracted for each day the project remained incomplete past the initial June 15, 2013 deadline. The town also maintained the option to cancel the entire contract if the project remained incomplete as of the new December 15, 2013 deadline.

Brightfields and Syncarpha were eventually able to close a financial deal with MS Solar Solutions and proceed with the installation. Representatives of both Brightfields and the town agree the long-term project economics made overcoming individual financial hurdles possible.

Success

In September 2013, Scituate officials joined Brightfields and its partners to proudly flip the switch on the town's landfill solar installation. The developer also partnered with town officials and school personnel to develop and implement a solar curriculum for K-12 students in the town. See next page for key takeaways from project participants.

For More Information

For more information about the RE-Powering America Initiative and tips on developing renewable energy on contaminated lands, visit [EPA's website](#).

Key Takeaways from Project Participants

- *While costs are an important consideration, towns should also evaluate a developer's ability to deliver a finished project and overall areas of expertise. Scituate officials evaluated credibility, experience, permitting expertise, and financing abilities before considering price. Towns and developers should both consider the long term, which includes ensuring the underlying economics of a project make sense and that the selected developer can withstand changes in the market.*
- *Contracts should include clear and consistent deadlines, including milestones along the project development process. Not only does this set expectations early on and hold all parties accountable at appropriate phases in the project, it provides a means for regular communication and the chance to address roadblocks as soon as possible.*
- *Having a good understanding of site conditions is critical to the success of a project. Especially when considering a renewable energy project on a brownfield site or landfill, developers should gather as much information about the site as possible, including collecting information about the site's history and conducting site assessments as appropriate. Issues discovered during the assessment are not necessarily deal-breakers, but knowing the site and partnering with the town to determine liability ahead of time can reduce headaches, expense, and environmental issues.*
- *Support from state and local agencies can be crucial. Scituate notes that MassDEP was supportive of the landfill solar project, which saved the town and the developer both time and money. In particular, MassDEP offered clear and consistent permitting guidance, and was responsive to questions and permit submittals.*
- *Communicate with the community during all phases of the project. Though the Scituate community already had a demonstrated commitment to environmental and sustainability issues, the town made no assumptions about whether the community would support the solar project. Scituate officials engaged residents through town meetings and various public relations activities from the earliest phases of the project. The town was transparent about challenges as well as benefits.*
- *Communication among the developer, the town, and other stakeholders is also crucial. Scituate officials, Brightfields, MassDEP, and other stakeholders such as National Grid maintained regular communication and insisted on transparency about progress and concerns. This facilitated the partnership approach that helped the project overcome technical and financial hurdles.*