

Final Technical Report
City of Brockton, Massachusetts
City of Brockton Solar Brightfield: Deploying a Solar Array on a Brockton Brownfield

Date of Report: August 23, 2007

Recipient: City of Brockton, MA

Award Number: FG36-06GO86076

Working Partners: Global Solar Energy (solar photovoltaic system installers), National Grid (local utility providing interconnection services), Bay State Gas Company (property owner)

Cost-Sharing Partners: N/A

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DOE Project Team:	DOE Field Contracting Officer	-	Beth Dwyer
	DOE Field Project Officer	-	Glenn Doyle
	DOE Field Project Officer	-	Joe Lucas

Distribution Limitations: None

EXECUTIVE SUMMARY

The City of Brockton, Massachusetts sought to install New England's largest solar array at a remediated brownfield site on Grove Street. The 425-kilowatt solar photovoltaic array – or “Brightfield” – was installed in an urban park setting along with interpretive displays to maximize the educational opportunities. The “Brightfield” project included 1,395 310-Watt solar panels connected in “strings” that span the otherwise unusable 3.7-acre site. The project demonstrated that it is both technically and economically feasible to install utility scale solar photovoltaics on a capped landfill site. The US Department of Energy conceived the Brightfields program in 2000, and Brockton's Brightfield is the largest such installation nationwide. Brockton's project demonstrated that while it was both technically and economically feasible to perform such a project, the implementation was extremely challenging due to the state policy barriers, difficulty obtaining grant funding, and level of sophistication required to perform the financing and secure required state approvals. This demonstration project can be used as a model for other communities that wish to implement “Brownfields to Brightfields” projects; 2) implementing utility scale solar creates economies of scale that can help to decrease costs of photovoltaics; 3) the project is an aesthetic, environmental, educational and economic asset for the City of Brockton.

ACCOMPLISHMENTS COMPARED TO PROJECT GOALS AND OBJECTIVES

The City of Brockton's objective for the project was to purchase and install about three quarters of the solar modules on the Brightfield site and to provide grant-related project management/grant administration services. The project accomplished its stated goals and objectives.

SUMMARY OF PROJECT ACTIVITIES FOR THE FUNDING PERIOD

There were three primary tasks identified for this Scope of Work. All three have been completed, as described below.

PHASE 1 -- DEPLOY SOLAR BRIGHTFIELD

The City of Brockton signed a contract with Global Solar Energy, Inc. to install, operate and maintain the Brightfield. This DOE grant covered a portion of the work including the following.

Task 1.0 Equipment Delivery

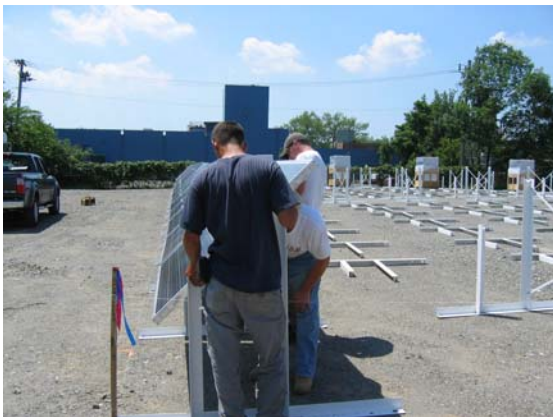
The PV modules, inverters, and balance of plant were delivered to the site in the weeks of July 7 and 14, 2006. This project included the purchase of 1,055 310kW SCHOTT Solar modules, which were manufactured in Billerica, MA.





Task 2.0 Installation

The City of Brockton issued a notice to proceed to Global Solar Energy on July 31, 2006. Global Solar Energy installed the frames and modules in July and August, and had completed this installation by September 1, 2006. Global Solar strung the arrays throughout August, and connection of panel strings was completed in September. The local utility (National Grid) installed a utility pole. Global Solar also connected the Sat Con power conversion system, installed the Fat Spaniel Technologies data acquisition system, and completed the utility connections with National Grid on September 25, 2006.







This project is the largest Brownfield to Brightfield installation nationwide. The Brightfield is an environmental, economic, educational and aesthetic asset to the City.

Task 3.0 Project Management and Grant Administration,

The project is overseen by the Department of Public Works, under the direction of the Commissioner. The DPW provided project installation oversight with regular inspections by the City electrical inspector. The DPW Commissioner received administrative help through his administrative assistant, with assistance of a contractor who serves as the Brightfields coordinator. The team processed payments to Global Solar Energy, worked with the Auditing Department for internal cost and grant tracking, processed reimbursement requests and prepared grant reports.

Problems Encountered, Departure from Planned Methodology, Impact on Project Results

The primary problem encountered was heavy rainfall in May and June, which delayed site preparation work and system installation. Because there is an HDPE membrane capping the landfill, it was important to allow drainage. The net result was a slight scheduling delay in the initial stage of the project, but the panels were installed quickly, so there was not a net project result. Weather can serve as a factor in any similar project, so it is not considered a significant issue.

PRODUCTS DEVELOPED UNDER THE AWARD:

The 425 kW photovoltaic system is the primary product produced through this award. There was no travel, publications, or presentations through performance of this award. There are no associated patents.

The city is in the process of developing a website about the project, with a link to be forwarded. In the meantime, data on system performance can be found at:

<http://www.fatspaniel.com/demos/system-data.html>, click on “Live Sites”, on the left hand side for Installers, scroll down to Global Solar Energy, then click on Brockton Brightfields for production data.

Major Task Schedule

Task Number	Task Description	Task Completion Date				Progress Notes
		Original Planned	Revised Planned	Actual	Percent Complete	
1	Equipment Delivery	3/31/06	8/7/06	7/17/06	100%	Task complete
2	Installation	6/30/06	8/8/06	9/25/06	100%	Task complete
3	Project Management/ Grant Administration	Ongoing	Ongoing	Ongoing	100%	Task complete

Spending Summary

Object Class Categories Per SF 424a	Approved Budget	Project Expenditures	
		This Quarter	Cumulative to Date
a. Personnel	\$0	\$0	\$0
b. Fringe Benefits	\$0	\$0	\$0
c. Travel	\$0	\$0	\$0
d. Equipment	\$0	\$0	\$0
e. Supplies	\$0	\$0	\$0
f. Contractual	\$1,386,000	\$1,386,000	\$1,386,000
g. Construction	\$0	\$0	\$0
h. Other	\$0	\$0	\$0
i. Total Direct Charges	\$0	\$0	\$0
j. Indirect Charges	\$0	\$0	\$0
k. Totals	\$1,386,000	\$0	\$0
DOE Share	\$693,000	\$693,000	\$693,000
Cost Share	\$693,000	\$693,000	\$693,000
Calculated Cost Share Percentage	50%	50%	50%

Cost Share Contributions

Funding Source	Approved Cost Share		This Quarter		Cumulative to Date	
	Cash	In-Kind	Cash	In-Kind	Cash	In-Kind
Municipal Bond	\$693,000	\$0	\$693,000	\$0	\$693,000	\$0
Total	\$693,000	\$0	\$693,000	\$0	\$693,000	\$0
Cumulative Cost Share Contributions						\$693,000