

City of Biddeford Solar Wall Installation

Background

The City of Biddeford performed a number of energy efficiency upgrades throughout the city in 2009. This work included building evaluations and typical lighting and weatherization upgrades.

Of particular note was concern for cost effective heating of the 150 foot by 350 foot garage at public works known as the “high bay”.



Large overhead doors allow vehicle access throughout the day, causing rapid temperature changes and air stratification within the building.

Solution

In 2014, Efficiency Maine Trust (EMT) released a grant opportunity for Research and Development and Demonstration Projects under the Renewable Resources Fund. In partnership with Shift Energy, the City applied for and received a demonstration grant. Utilizing the funding, the City constructed a 3,200 sqft solar hot air system for the south facing wall of the garage in the fall of 2015. System components include a custom solar wall, phase-change lining, and distribution fans.

Building air is drawn in at the bottom of the wall, heated, and sent back into the building through two 8,000 cfm distribution fans at the top of the wall controlled by variable frequency drives. The fans speed up or slow down based on the temperature within the solar wall. The distribution system mixes

the air to establish a more uniform temperature while reducing stratification within the building.

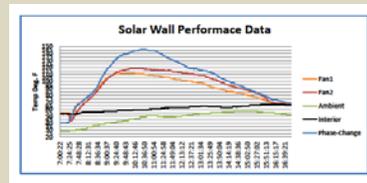


The solar wall is lined with phase-change material. This material changes from a solid to a liquid as it absorbs heat and then releases the heat over time stabilizing heat transfer.



Ongoing Monitoring

Ongoing monitoring will be performed and performance data made available through the City’s website. <http://tinyurl.com/biddsolarwall>.



Project Summary

Total cost:	\$102,640
Solar Wall portion:	\$ 73,500
EMT Grant:	\$ 62,500
Projected Savings:	\$ 5,660/yr
CO _{2e} Reduction	27.3 tn/yr



Site Location:

City of Biddeford
Public Works Garage
371 Hill Street
Biddeford, ME 04005

Contact:

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Grant Funding:

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Contact:

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Installation:

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