

## Solar Learning Lab™ Case Study



Since opening in 1999, MASS MoCA has become one of the world's premier centers for making and showing the best art of our time. With annual attendance of 120,000, it ranks among the most visited institutions in the United States dedicated to new art. More than 80 major new works of art and more than 50 performances have been created through fabrication and rehearsal residencies in North Adams, making MASS MoCA perhaps the most fertile site in the country for new art. The museum thrives on making and presenting work that is fresh, surprising, and challenging.



Photo Credit: Mass MoCA

### Mass MoCA photovoltaic installation

**"I believe costs are going to continue to increase. It is essential for our survival to gain control over our energy future. I hope this the first step of several for the museum."**

Joseph C. Thompson

## MASS MoCA North Adams, Massachusetts

This new solar energy system is part of our commitment to clean energy sources. Photovoltaic energy provides safe and quiet power with little impact on the environment. Sunlight is free and abundant, giving solar energy systems guaranteed access to electrical power to meet the growing energy needs of today's world.

[Click here to view system details](#)

[Click here to view educational activities](#)

**VIEW DATA**

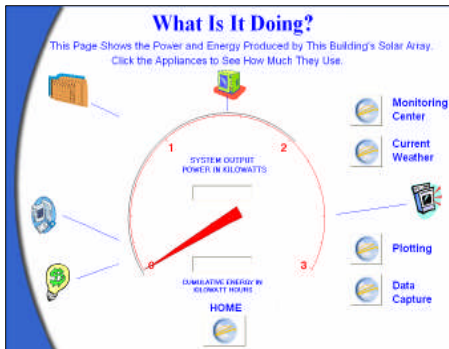
System Snapshot Updated Every 15 Minutes		
Energy generated today:	33.5	KWH
Energy generated since installed:	39324.3	KWH
Current power output from solar panels:	0.00	KW
Power in the sunlight:	0.0	KW
Solar panel temperature:	-4.0	°C
Avoided carbon dioxide emissions since installed:	35274.0	KG

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### SunViewer.net™ Internet Data Portal

MASS MoCA serves as a center of innovation in Western Massachusetts and the introduction of solar photovoltaic cells at the museum will serve as a demonstration project for the entire Commonwealth on the uses and cost savings that energy efficiency and renewable energy resources can provide to residents, businesses, and non-profit organizations. The array is crafted as a work of art. Part of the display is a kiosk for which data display software and data monitoring is provided by Heliotronics, Inc. The kiosk includes over 45 pages of real time data and educational information about solar energy. Data displays include real-time solar power production, avoided emissions, system efficiency, and weather data.

Joseph C. Thompson, the museum's director, said escalating energy costs are a real worry for nonprofits like MASS MoCA, but grants such as this one are a way to help reduce the budgetary line item for utilities.



### SunViewer™ Display Software

MASS MoCA previously created educational wind energy art activities at its “Kidspace” contemporary art gallery and for an energy site analysis. Art by schoolchildren who visited the gallery was featured in the 2005 Windspirations calendar.

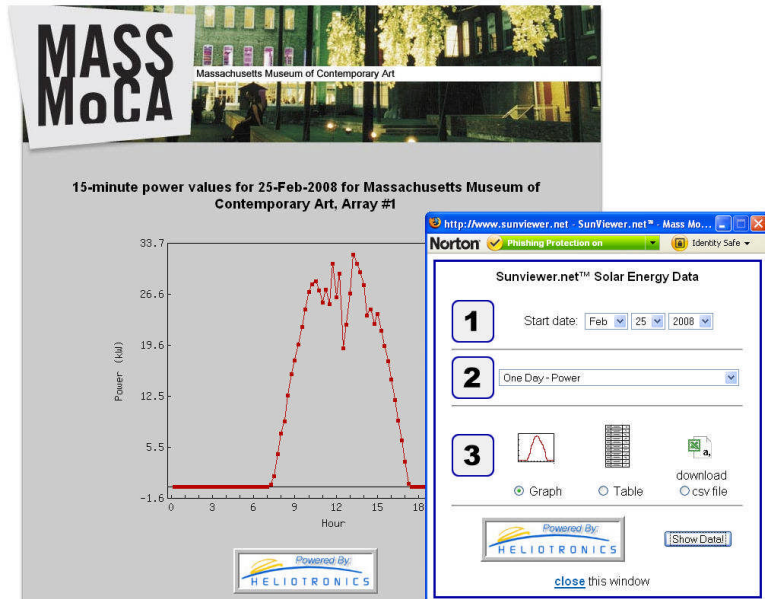


Photo Credit: Mass MoCA  
Roof View of array and instrumentation.



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Over the past few years, the museum's utility costs have skyrocketed as prices have continued to increase. "It's really hurt. Our budget has not gone up as much as the energy costs have. Our utility costs have tripled since 1999. Originally, we had costs of about \$100,000 to \$200,000 a year. Now its \$600,000 or more. It's our largest line item by far,"



### Project Snapshot

*Funded with Massachusetts Renewable Energy Trust dollars through the Massachusetts Technology Collaborative's LORI program.*

*Installation team: **Berkshire Photovoltaic Services**  
<http://www.bpvs.com/>*

*Data Monitoring System: **Heliotronics** Becquerel 3P™ Package*

*Monitoring System Specs: Monitors real-time PV power and energy output, system efficiency, avoided emissions, irradiance, PV module temperature, ambient temperature and wind speed*

*User Interface: Heliotronics' SunViewer™ K educational display software running on a touch screen kiosk. SunViewer.net™ data portal on the Internet.*

*PV Installation: (96) Schott ASE300, (132) Evergreen ES-180-SL modules.*

*PV System Capacity: 52 kW (grid-connected)*

*Inverter: 4 Solectria PVI 13kw Inverters*

*PV Mounting: Roof mounted*