

City of Worcester, Massachusetts



SUSTAINABILITY PROFILE

Harvesting Sun's Energy at Sullivan Middle School

Location: 140 Apricot Street (Sullivan Middle School)

Solar Array's Capacity: 186 kW DC



780 solar panel modules are spread across the polygonal flat roof of Sullivan Middle School, producing approximately 143,000 kWh per year (see chart below).

The 181,536 kWh produced since going on line in January 2014 through March 2015, was an equivalent to an estimated 9.6% of the school's electricity needs¹ and translates to ~\$1,500/month and \$22,650 in savings to date as a result of avoidance of electrical costs.

Revenue from sale of generated renewable energy [credits](#)² helps to pay for the project's debt (in a form of a bond).

PV System Specifications and Other Interesting Facts:

- ✓ **Maximum rated capacity:** 186 kW DC
- ✓ **Owned by:** City of Worcester
- ✓ **Date in service:** 1/6/2014
- ✓ **Number of panels:** 780
- ✓ **PV surface area:** ~13,700 SF
- ✓ **PV panel rated efficiency:** 15%
- ✓ **Azimuth:** 208°
- ✓ **Inclination:** 15°

- ✓ **Project Cost** (materials and labor): ~\$1,487,000
- ✓ **Funding Source:** City's Energy Savings Performance Contract

- ✓ **PV panel manufacturer:** Sharp
- ✓ **Inverter manufacturer :** SatCon Technology
- ✓ **Service Provider :** Borrego Solar Systems LLC

¹ Sullivan Middle School is on the same electrical meter as South High School. In order to estimate electrical consumption of Sullivan MS, both schools' combined electrical consumption was split proportionally according to the square footage of each building.

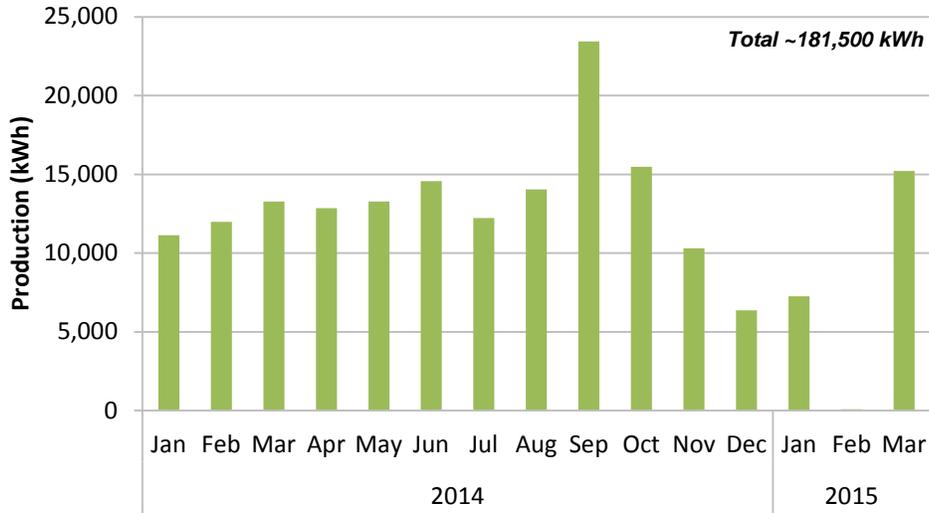
² 1 SREC is produced and sold for each megawatt-hour of electricity produced or 181 certificates as of end of March 2015.



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Sullivan Middle School's Solar System:
Electricity Production by Month, January 2014-March 2015



Note: The record snowfalls this winter caused the electrical production to plummet in February, 2015. The production resumed to a healthy level in March.

Source: Massachusetts Clean Energy Center's Production Tracking System database



Sullivan Middle School's PV system is composed of groups of solar panels that are placed in various sections of the polygonal flat roof held down with ballasts (here - stacks of bricks).

Operation and Maintenance: While this project has not yet been closed out, Honeywell International is responsible for detecting and correcting any system malfunctions detected via on-line monitoring of electrical production. Following completion of the Energy Savings Performance Contract phase associated with this project, the City's Division of Energy and Asset Management will monitor actual electricity production against anticipated production, and the Worcester Public Schools' Facilities Department will be responsible for the general system maintenance.

Forthcoming solar project: In the fall of 2015, Sullivan Middle School will install carport solar panels in its parking lot with a rated output of 484.9 kW DC – nearly three times the size of the school's current PV system. This total PV system is estimated to cover approximately 35% of school's electrical needs annually!