THIRD SUN SOLAR

Photo of 130kW Third Sun installation on Akron Metro Regional Transit Hub

Photovoltaic System Summary

Physical Description & Performance Details

Clay High School

Rooftop Solar

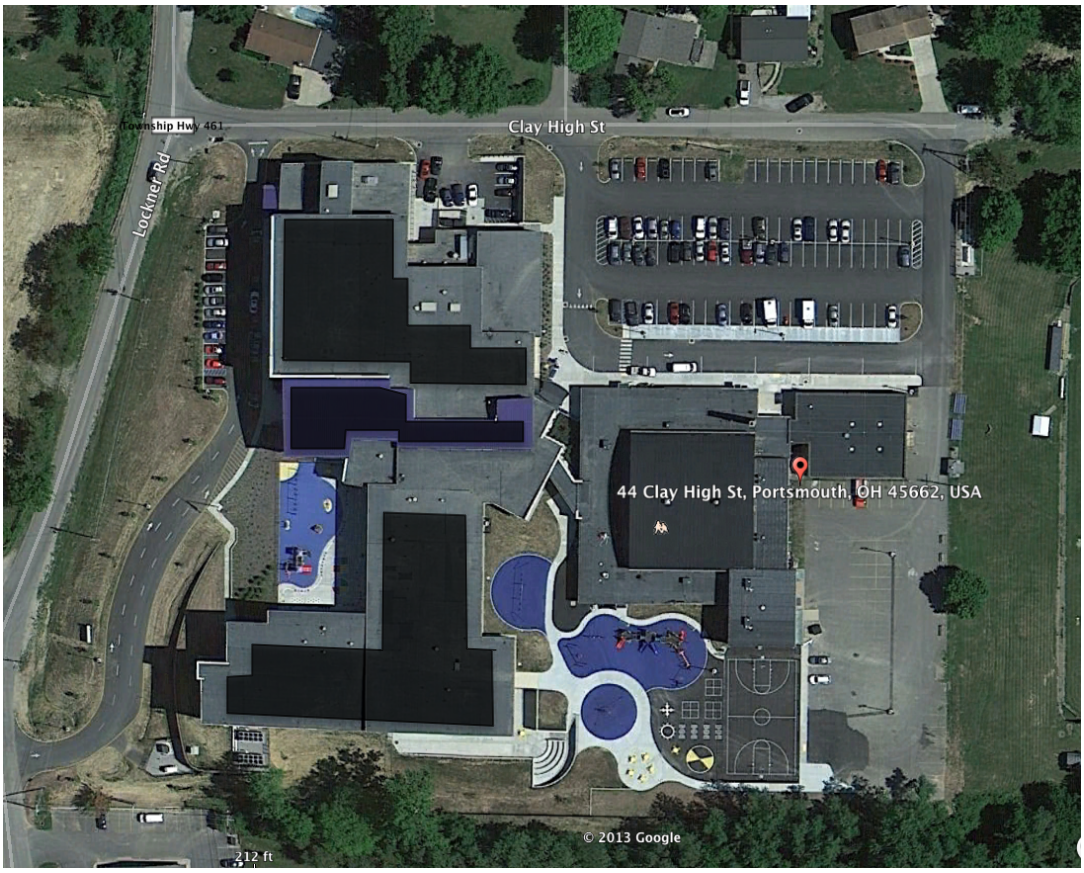
Proposed System

The proposed solar system is designed to provide the greatest utility savings for the lowest cost. Solar arrays will be located on the standing seam metal roof and all suitable flat roof areas of the new school building. High efficiency, crystalline solar panels will be utilized and all racking systems will be non-penetrating.

System Size (kW, DC) **374.400 kW**

PV module	Canadian Solar or equivalent		Approximate Qty of modules:		1,248
Inverter (s)	SMA or equivalent		Total Qty of inverters:		TBD
Total array area:	37,440	square feet	Solar array weight:	6	lbs/sq ft.

Photo below shows approximate locations and footprints of the solar arrays.



Black rectangle shows approximate area required by PV array. PV array can be located in any suitable location you desire. Clear spaces will be maintained around roof obstructions to allow maintenance access and avoid shading.

System size is approximate. Actual system size may vary slightly with site-specific electrical, structural requirements, unforeseen field conditions and module availability. Specification of alternate products will be of equivalent or better quality and performance.

Expected Performance - Lifetime

System Size (kW, DC)	**374.400 kW**
DC-AC derate (overall electrical efficiency of entire system)	81%
AC Output (kW) at STC	303.3 kW
Energy Production	
First Year Energy Production (kWh)	421,056 kWh
Building's Historic Annual Electric Usage (kWh)*	913,900 kWh
Fraction of yearly electric energy demand supplied by solar	46%
Expected Annual Performance Degradation	0.50%
Energy Production in year 30 (kWh)	364,090 kWh
Lifetime Energy Production (kWh)	11,757,217 kWh

DC-AC derate accounts for all of the various efficiency losses of the entire system including inverter, wiring, module variability etc. AC output is the *approximate* maximum power output the system will deliver during full sun on a cool day. Monthly and annual performance summaries shown here combine this power output with the expected sunlight of your particular site, system availability, snowfall and any other expected performance losses, to come up with monthly and annual energy production predictions.

Environmental Impact

Greenhouse gas emissions reduced at regional power plants

Annual carbon offset (tons CO_2/year)	417 tons / year

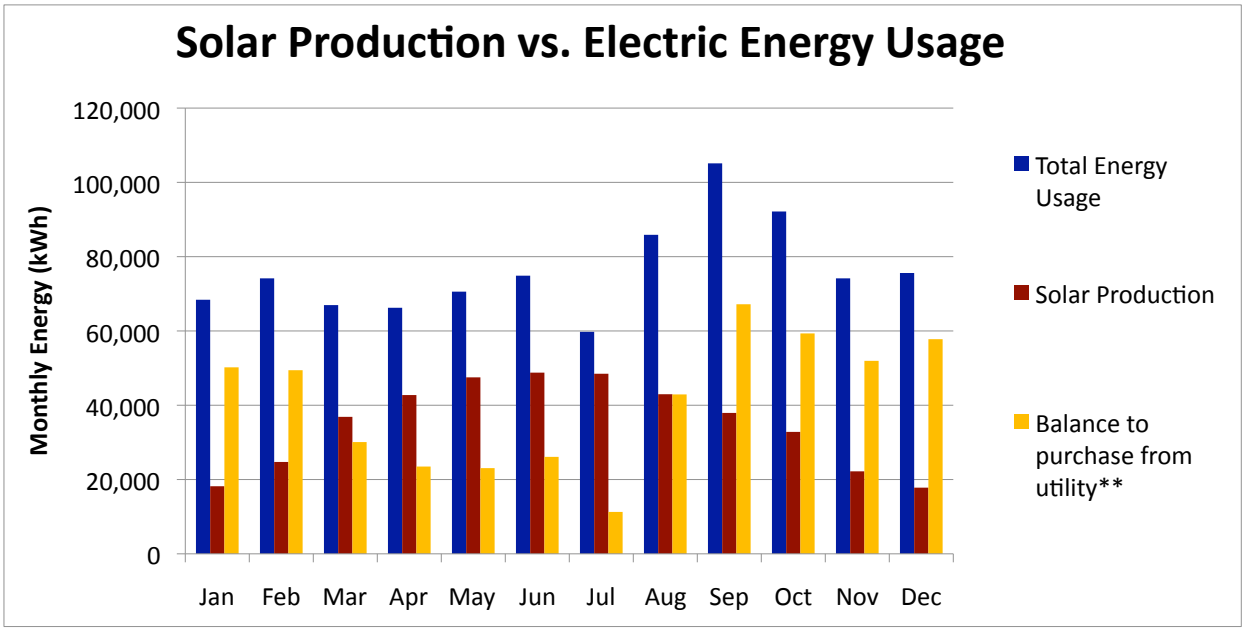
Greenhouse gas emissions reductions equivalent to the carbon emissions from:

Passenger vehicles driven each year	74 cars
Gallons of gasoline consumed	42,431 gallons
Barrels of oil consumed	880 barrels
Average households using electricity	46 houses

Carbon emissions reduction equivalent to the carbon sequestered by:

Tree seedlings grown for 10 years	9,705 trees
Acres of pine forest	81 acres

Expected Performance - Monthly



*Energy usage based on customer supplied data, or hypothetical usage, whichever applies

*** Negative numbers indicate Net Excess Generation sold to utility. See Net Metering note below.*

Month	Production (kWh)	Usage* (kWh)	Solar Fraction
Jan	18,194	68,400	27%
Feb	24,731	74,160	33%
Mar	36,875	66,960	55%
Apr	42,743	66,240	65%
May	47,508	70,580	67%
Jun	48,779	74,880	65%
Total:	**421,056**	913,900	**46%**

Month	Production (kWh)	Usage* (kWh)	Solar Fraction
Jul	48,480	59,760	81%
Aug	42,966	85,880	50%
Sep	37,933	105,120	36%
Oct	32,825	92,160	36%
Nov	22,208	74,160	30%
Dec	17,815	75,600	24%

Average (kWh/month): 35,088

Net Metering

Net Metering ensures you will receive full retail credit for all of the solar production, up to 100% of your monthly electrical consumption. If the solar system produces more energy in a month than your facility uses that month, the excess production is called Net Excess Generation (NEG). Monthly NEG is credited at the "Price-to-Compare" rate and carried over to next month's bill.

Notes and Assumptions

STC rating is based on Standard Test Conditions (STC): irradiance of 1000/m2; air mass 1.5g, and cell temperature 25 C.

Number of modules is approximate as manufacturers may change modules wattages at any time. Exact number of modules will be as required to reach specified system size at time of equipment ordering.

System size is approximate. Actual system size may vary slightly (less than 4%) with specific electrical, structural requirements, unforeseen field conditions and module availability. Specification of alternate products will be of equivalent or better quality and performance.

DC-AC derate accounts for all of the various efficiency losses of the entire system including inverter, wiring, module variability etc. AC output is approximately the maximum power output the system will deliver during full sun. Monthly and annual performance summaries on the following pages combine this power output with the expected sunlight of your particular site, system availability, snowfall and any other performance losses, to come up with a monthly and annual energy production prediction.

Energy production figures are based on the National Renewable Energy Lab (NREL) 30-year database of historic average sunlight for the location and corrected for site-specific orientation, shading, snow cover, soiling, system availability, system component efficiency factors and all other reasonably expected performance losses. Actual production will vary from the values shown by up to 40% for individual months and up to 20% for individual years. Compared to long-term performance over many years, however, the values shown in these tables are accurate to within 10% - 12%.

Expected Lifetime Energy Production is based on an assumed 30 year life. The specified solar modules are warranted to produce at least 80% of rated power for 25 years. Your system will likely continue producing energy beyond 30 years with a gradual decline in annual output.

Building usage data based on client-provided historical data. Actual solar fraction will depend on future facility demands. Energy efficiency and conservation measures will increase the solar fraction above the estimates shown here.

Carbon emissions and Environmental equivalents calculated based on U.S. EPA data found on web calculator: http://www.epa.gov/cleanenergy/energy-resources/calculator.html#results.

The generic EPA data has been corrected for the specific emissions mix (baseload and peaking as appropriate) of Ohio and surrounding states, given here:

http://www.epa.gov/cleanenergy/documents/egridzips/eGRID2010V1_1_year07_GHGOutputrates.pdf