



THIRD SUN SOLAR

Solar PV Economic Summary

Photovoltaic System Cost, Incentives and Analysis



Photo of 45kW Third Sun installation at Doran Manufacturing in Cincinnati

Clay High School

Rooftop Solar
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Solar Economics

Investing in a solar system provides a hedge against future energy prices while simultaneously lowering your company's carbon footprint.

A well designed solar project considers the economics of the project along with the physical attributes of the solar system. Because of the significant incentives available to solar projects today we often find that the final system design is impacted as much by the applicable incentives as by the desired energy production goals, aesthetics and construction constraints.

At Third Sun, our mission is to provide you with the optimum solar solution that meets your project goals. To that end we are providing a summary of the available financial incentives for your project and analysis of the overall project economics.

Third Sun's core expertise lies in designing and installing high quality solar electric systems for all customers, residential to utility scale. We are not certified accountants. We provide this economic analysis solely to show you how the solar economics may work for your project. To do this we have combined our solar production expertise and industry-wide experience with some reasonable accounting assumptions and these are noted in the remarks sections.

Your accounting professional should be the final authority on the economics of your particular solar project. To ensure we design the optimum solar system for you we can provide your accountants with whatever performance and incentive information they need in order to make those determinations.

The information below shows the economics you can expect for the given system being considered based on system size, cost, equipment selection, layout and expected solar resources. These items may or may not be approximate. Please refer to a Third Sun quote provided separately for firm cost details, equipment detail, scope of work and terms and conditions.

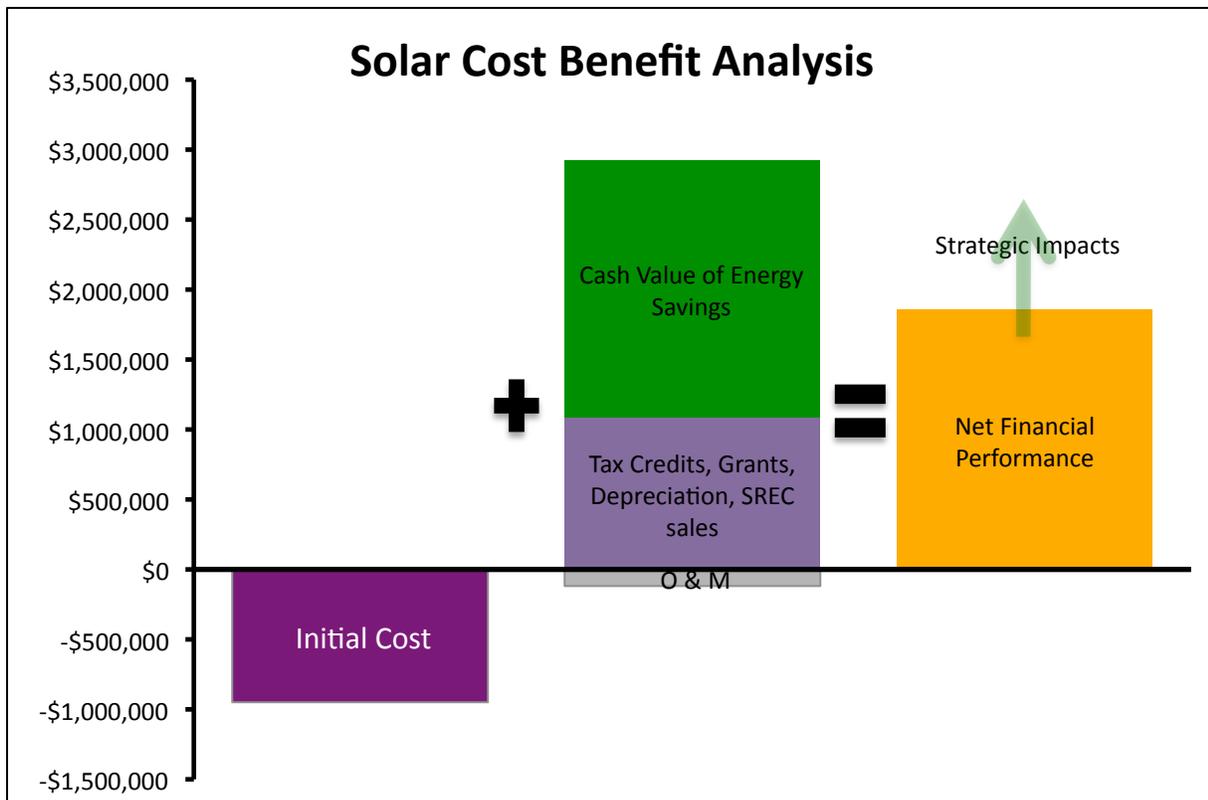
Thank you for choosing Third Sun for your Renewable Energy needs!

Solar Economics Summary

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.

Proposed PV System Size	374.400 kW	Approximate maximum capacity
Total Project Cost	\$ 949,264	Total project cost for turn-key system.
Annual Energy Production	421,056 kWh	

Initial costs of a solar system are rapidly reduced by tax credits, SRECs and depreciation benefits. Once installed, solar systems create free energy for 30+ years. Assuming the cost of fossil fuel energy will continue to rise over time, the cost of doing nothing far exceeds the net cost of going solar.



Initial Cost is total project outlay for turnkey design/build system. Tax credits, grants, SRECs represent all of the various incentives that would apply to this project.

Net Value of Energy includes estimated cost of utility power for 25 years assuming an annual rate increase, less tax benefit of expense write-off.



Costs and Incentives over Time

In addition to reducing utility costs, your solar PV system qualifies for the following available incentives ¹ :

30% Federal Tax Credit

Tax benefits of accelerated depreciation shown using 5-yr MACRS.

Performance-Based Incentives or Solar Renewable Energy Certificate (SREC) Sales

Combined, the power production, incentives and strategic benefits will yield net cash flows as shown below:

	Cumulative Values		
	Year 1	Years 1-7	Years 1 - 30
	Financial Impact		
Project Cost	\$ (949,264)	\$ (949,264)	\$ (949,264)
Grant	\$ 949,264	\$ 949,264	\$ 949,264
Federal Tax Credit	\$ -	\$ -	\$ -
Depreciation (cash value)	\$ -	\$ -	\$ -
State Tax Credit	\$ -	\$ -	\$ -
O&M & Inverter Replacement	\$ (1,899)	\$ (14,547)	\$ (118,801)
Utility Savings	\$ 35,748	\$ 277,930	\$ 1,839,350
Performance-Based Income	\$ 20,211	\$ 109,738	\$ 135,611
Additional Tax Effects ¹	\$ -	\$ -	\$ -
Cumulative Cash Flow	\$ 54,060	\$ 373,121	\$ 1,856,159

Solar will be the most recognizable component of your overall sustainable energy efforts. You may find solar to be of high value when communicating with customers and strategic partners. Or it may be attractive for retaining and recruiting employees. Use the table below to add approximate values for these benefits to show the overall benefit of your investment.

	Strategic Impacts		
Recruitment & Retention	\$ -	\$ -	\$ -
Public Relations	\$ -	\$ -	\$ -
Customer & Sales Gains	\$ -	\$ -	\$ -
Community Goodwill	\$ -	\$ -	\$ -
Cumulative Cash Flow (with customer, PR, staffing & community benefits)	\$ 54,060	\$ 373,121	\$ 1,856,159

¹ Additional Tax Effects displays a single lump sum that covers several factors: Includes tax on grants, tax effects of operational expenses and lost tax deductions from reduced utility expenses. There are multiple ways to handle the tax effects. Your tax professional can identify the optimum tax strategy for the solar investment.

Return On Investment

Considering Only Energy Savings and Incentives

Cumulative Cash Flow Positive in year 1 with system life of est. 30+ yrs.

Years of free energy after reaching cash flow positive 29

Net Present Value \$ 454,865 30 year NPV at 9%

10 year IRR 25%

30 year IRR 27%

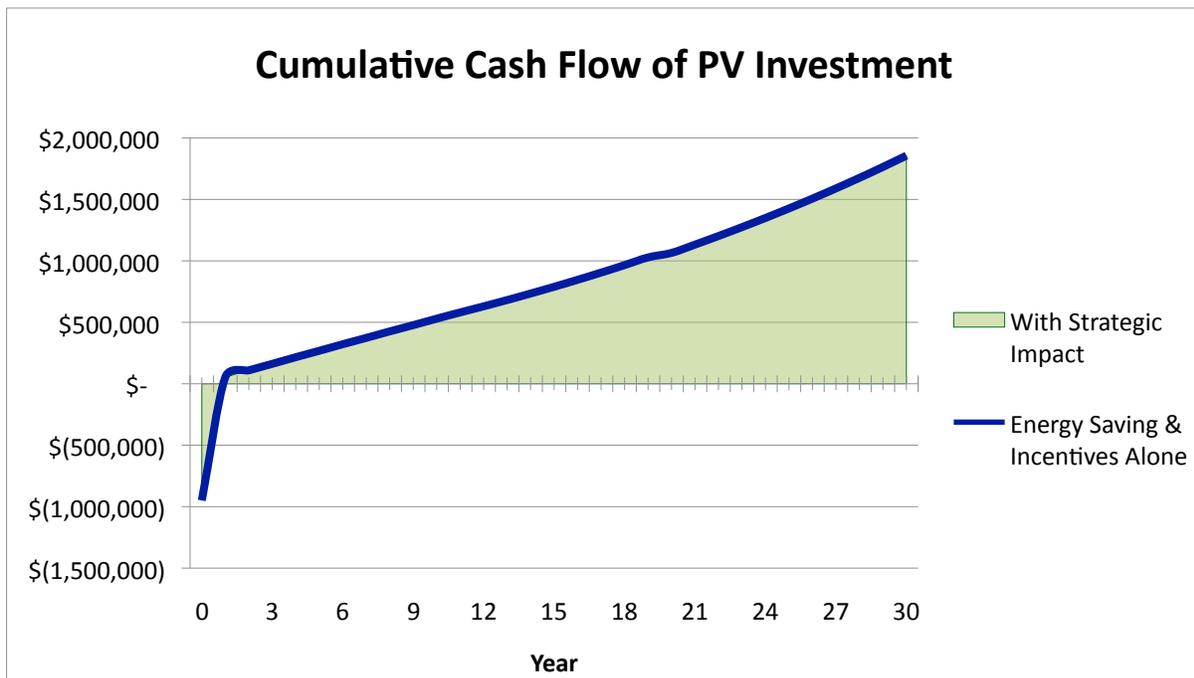
Including Strategic Impacts

Cumulative Cash Flow Positive in year 1 with system life of est. 30+ yrs.

Net Present Value \$ 454,865 30 year NPV at 9%

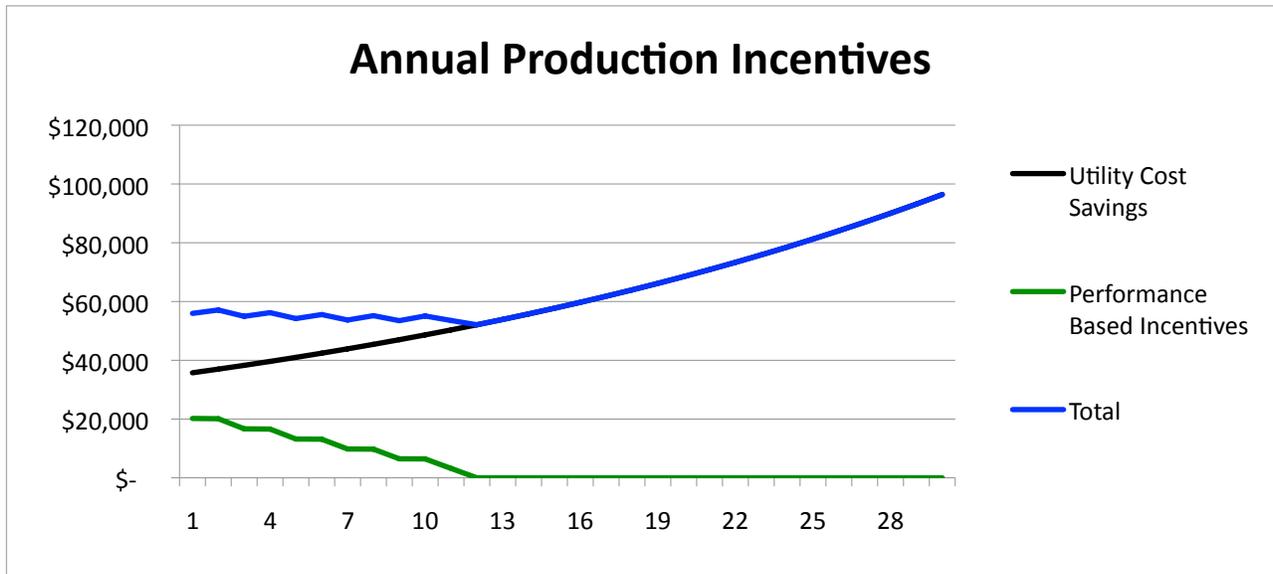
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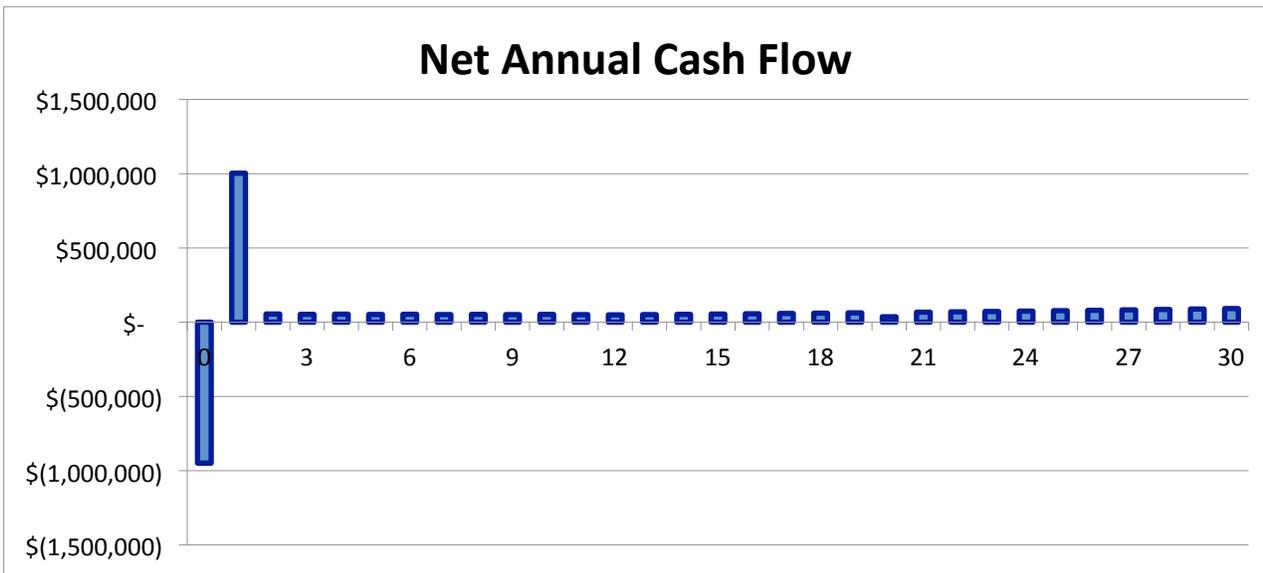


* Any Strategic impacts included in this analyses are shown on page 4. Having solar can be beneficial in attracting and retaining customers and employees. Third Sun can provide suggestions on how to quantify these benefits.

Return On Investment



This graph shows the cash flows resulting from solar PV production. Performance incentives include REC sales and any performance-based credits. The above is based on conservative assumptions and include performance degradation and annual utility cost escalation rate shown in the notes.



The graph above shows the net cash flow resulting from an investment in solar PV. Net cash flow includes avoided utility costs, SREC sales, annual O&M allowance, and inverter replacement in mid-life.



Operations and Maintenance

Solar PV systems require very little maintenance or operational attention. Apart from a few periodic inspections required by manufacturer's warranties, one only needs to monitor system output and keep vegetation from growing and casting shade on the modules. Everything else is automatic. In the Midwest, wind and rain are typically sufficient for keeping modules clean. Solar arrays located in particularly sooty areas may benefit from additional cleaning.

Expected system life	30 + Years	Solar module power warranty	25 Years
Inverter replacement at year	15 Years	Module workmanship warranty	10 Years
System operation	Fully Automatic	Inverter warranty	10 Years
		Installation warranty	10 Years
Suggested annual budget allowance for O&M:		\$	1,899

Annual Operations & Maintenance (O&M) cost shown does not include inverter replacement. System owners may be able to consider inverter replacement as a capital expense.

O & M cost is based on industry average experience and is representative only. Actual O & M costs will vary.



Notes and Assumptions:

The solar cost shown here is for discussion purposes only and is meant to illustrate the relevant economics surrounding your solar project. Please contact Third Sun for a firm quote.

Third Sun Solar handles ALL aspects of every solar job for you. Cost estimate shown includes:

- Complete PV system design, equipment, materials, installation and commissioning
- Professional engineering, permitting, utility interconnection and typical warranty-mandated roof protection
- Internet-based performance-monitoring system. SREC compliant revenue-grade metering.

Cost Estimate does Not include:

- Prevailing Wage
- Performance Bond

Please refer to a Third Sun Solar quote for actual scope and terms of your project.

Analysis assumes receipt of Performance Based Incentives (PBI) or sale of Solar Renewable Energy Credits (SRECs) if available. Values assumed for PBI or SREC reflect current program rules and market conditions and assumptions regarding future valuations.

Grants are regionally and customer specific and may or may not apply to your system. If a grant is applicable, Third Sun Solar will prepare and submit grant application on your behalf.

Depreciation savings assumes the following: Effective Tax Rate: 0.0% Cash flow reinvestment rate: 9.00%

Depreciation Savings approximated for representation only. Actual values will depend on your particular tax status and details.

Simplified cost of energy equals the Net Cost divided by the Lifetime Energy Production

NPV shown above may not fully account for tax activities.

Utility savings assumes the following:

Utility :	AEP with CRES	Utility Rate Structure:	GS-2 w CRES
Assumed effective utility rate (\$/kWh)	\$ 0.085	Utility cost escalation rate:	4.00%

PV system output varies continuously with solar irradiance. The ability of PV systems to offset utility demand charges depends on the timing and nature of the peak demand. For simple conservative analysis we assume PV output will not reduce demand charges. Hence, the effective utility rate shown above includes only those tariffs, taxes and fees that are based on "per kWh" usage. Monthly fixed costs and charges associated with "per kW" demand fees are not included. With more detailed information on your utility usage patterns we can use statistical modeling to estimate PV impact on demand charges. Contact Third Sun for details.

Tax effects of utility savings are included in IRR and NPV calculation, but are not shown in annual utility savings figure on p. 3.

Energy production estimates are based on the National Renewable Energy Lab (NREL) 30-year database of historic average sunlight for the location. 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 the warranty period. Your system will likely continue producing energy beyond 30 years with a gradual decline in annual output.

Third Sun cannot offer tax advice. Consult your tax professional for complete tax implications.