noēsis®

Building the Commercial Solar Business Case Step by Step

INTRO

Small to Mid-sized Commercial Solar Is (Finally) Here

Make no mistake; solar has arrived. The precipitous drop in the cost of solar panels and the Power Purchase Agreement [PPA] have transformed the residential solar market and made rooftop solar power generation accessible to hundreds of thousands of homeowners. Companies like Sunrun and SolarCity have quickly capitalized on this demand for leased residential solar systems that require no cash up front and no ongoing maintenance costs.

The commercial solar market has also gained considerable traction for larger, multi-million dollar systems, but the market for the smaller commercial projects is still largely undeveloped. This market, however, is big, with Greentech Media estimating that there are over 4 million commercial buildings in the United States alone that are 10,000 square feet or less. One of the biggest obstacles for the small to mid-sized commercial solar projects has been the lack of project financing, which had mostly consisted of financing requiring tax equity investment being lent only for multi-million dollar projects to the most creditworthy of borrowers. (Tax equity is capital provided for a solar project where the lender utilizes the investment tax credits.)

Fortunately, solar financing for commercial projects is changing. As equipment costs decline and the project economics improve, an increasing number of lenders are willing to fund commercial solar projects, many of whom can't or don't want to take advantage of the tax credits themselves. This has resulted in more straightforward financing, such as basic equipment leases, available for small to mid-sized solar projects.

THE ECONOMICS OF SOLAR:

Does Solar Make Sense for Your Business?

So, with financing more accessible for small to mid-sized commercial solar projects, is solar right for your business? As it turns out, it's not so simple. Determining the business case for installing solar on your building is not as easy as subtracting the cost of the solar panels and the cost of financing from your utility bill savings. The business case – and in fact the economic viability of your commercial solar project – requires a further understanding of your business and local utility rates and programs.

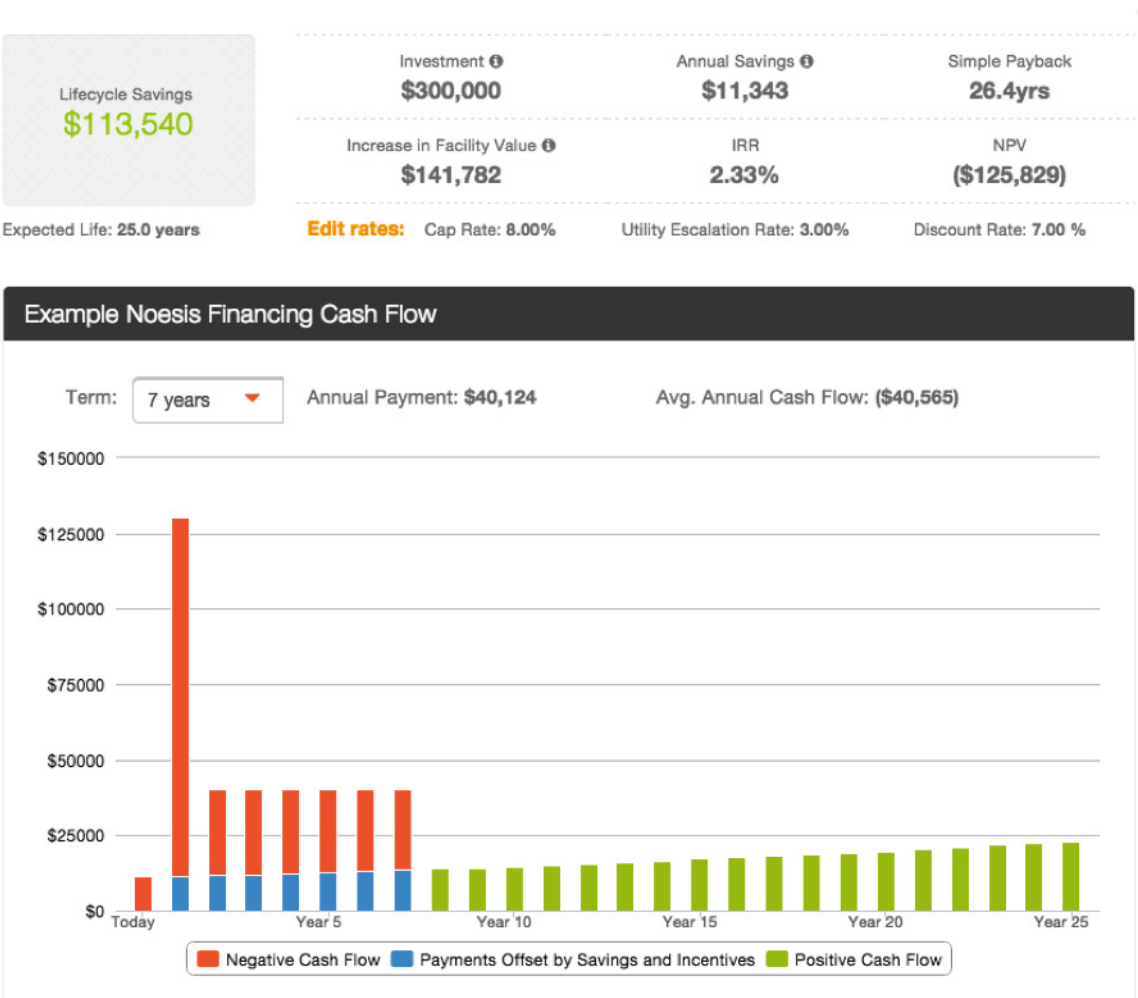
With recent decreases in costs, purchasing a solar array often makes sound economic sense. However, to fully understand the economics of your solar project, you must understand the impact of the following three factors:

1. Your Tax Appetite
2. Local Utility Rates
3. Local Solar Incentives

To illustrate, let's walk through a project and see how each of these three factors affects the economics of the project. As we go through this example, you'll see how a solar project can change from being economically uninteresting to being a clear winner.

For our example, we'll use a 90 kW system with a total cost of $300,000, and utility rates equal to $0.07/kWh. Because most small to mid-sized commercial projects are only feasible if they're financed, we'll assume that the project in our example is financed using a simple equipment lease with 30% down and a 7-year term, and we'll assume an average utility escalation rate of 3%.

The initial cash flow analysis is presented below (output using the Noesis platform).



Year	Savings	Tax Benefits/ Incentives	Payments	Down Payment	Payments Offset by Savings and Incentives	Cash Flow
1	$11,343		$40,124	$90,000	$11,343	($118,780)
2	$11,683		$40,124		$11,683	($28,441)
3	$12,033		$40,124		$12,033	($28,091)
4	$12,394		$40,124		$12,394	($27,730)
5	$12,766		$40,124		$12,766	($27,358)
6	$13,149		$40,124		$13,149	($26,975)
7	$13,544		$40,124		$13,544	($26,580)
8	$13,950		$1		$1	$13,949
9	$14,368					$14,368
10	$14,799					$14,799
11	$15,243					$15,243
12	$15,701					$15,701
13	$16,172					$16,172
14	$16,657					$16,657
15	$17,157					$17,157

The small red bar labeled ‘Today’ is the energy that will be produced by the solar system that turns into savings. After this, the red bars represent the portion of payments that are not offset by savings (primarily financing costs), while the blue bars represent the portion of payments offset by savings (budget neutral expenses). After year seven, the green bars represent the savings for the building owner. In year one, the large red bar represents the 30% down payment and the first year’s payment.

With a total cost of $300,00, the project has a 2.33% IRR and a simple payback of 26.4 years. Clearly, this is a project most building owners would not pursue.

So, how can the economics improve?

1. Your Tax Appetite

There are two main tax benefits that can improve solar project economics:

1. The Federal Investment Tax Credit (ITC)
2. The Modified Accelerated Cost Recovery System (MACRS, a.k.a. accelerated depreciation).

These two benefits can combine to reduce the net investment of a solar system up to 60%. The key is, the customer must have the tax appetite to take advantage of these benefits.

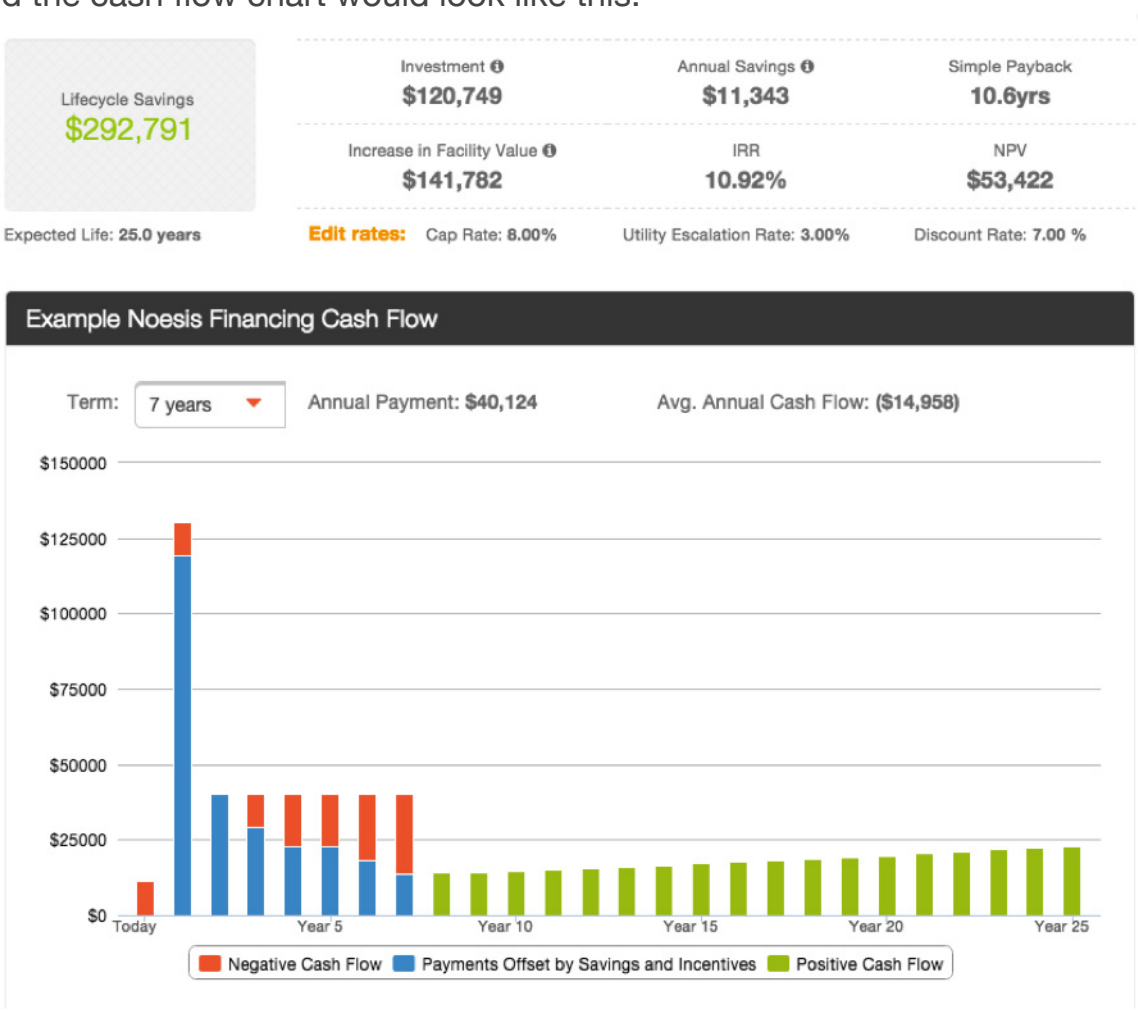
What does ‘tax appetite’ mean? It means that the business has corporate taxes that can be reduced by tax credits and deductions, i.e. lowering the business’ tax liability.

The Federal ITC is a credit and not based on a customer’s marginal tax rate. The MACRS benefit is a deduction that will be affected by the marginal tax rate, has a basis of 85% of total project cost, and is taken over 6 years. If we assume the customer has a marginal federal tax rate of 35% for this project, the values for the Federal ITC and MACRS look like this:

A	Gross Cost	$300,000	given
B	Tax Rate	35%	given
C	Federal ITC	$90,000	A x 30%
D.0	Total MACRS Value	$89,250	A x 85% x B

D.1	Year	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	**Total**
D.2	MACRS Schedule	20%	32%	19%	12%	12%	6%	**100%**
D.3	Annual MACRS Value	$17,850	$28,560	$17,136	$10,282	$10,282	$5,141	**$89,250**

Taking this information and putting it into the Noesis cash flow model, the economics of the project and the cash flow chart would look like this:



As you can see in the graph above, the down payment is offset by the benefit of the ITC and annual out of pocket expenses are reduced with the MACRS benefit. Overall the value of the tax benefits has increased the Internal Rate of Return (IRR) of the project by almost 5x to 10.92%.

Year	Savings	Tax Benefits/ Incentives	Payments	Down Payment	Payments Offset by Savings and Incentives	Cash Flow
1	$11,343	$107,850	$40,124	$90,000	$119,193	($10,930)
2	$11,683	$28,560	$40,124		$40,124	$119
3	$12,033	$17,136	$40,124		$29,169	($10,955)
4	$12,394	$10,282	$40,124		$22,676	($17,448)
5	$12,766	$10,282	$40,124		$23,048	($17,076)
6	$13,149	$5,141	$40,124		$18,290	($21,834)
7	$13,544		$40,124		$13,544	($26,580)
8	$13,950		$1		$1	$13,949
9	$14,368					$14,368
10	$14,799					$14,799
11	$15,243					$15,243
12	$15,701					$15,701
13	$16,172					$16,172
14	$16,657					$16,657
15	$17,157					$17,157

With a payback of 10 years, the project's economics are getting better, but still not a project that many would consider doing based solely on the investment analysis.

2. Local Utility Rates

The second most important factor is the local utility rate. Rates across the country vary significantly. This also includes the type of tariff that's available for solar projects in a particular area. While some utilities may have higher rates, the available solar tariffs can prove to be a detriment to the economics of the projects.

For this example let's assume the customer can take advantage of a favorable solar tariff that includes a reduction in demand charges. In some areas, this can lead to a blended benefit of up to $0.19/kWh. If we assume for this example that tariff is available, the project cash flows now look like this (next page):

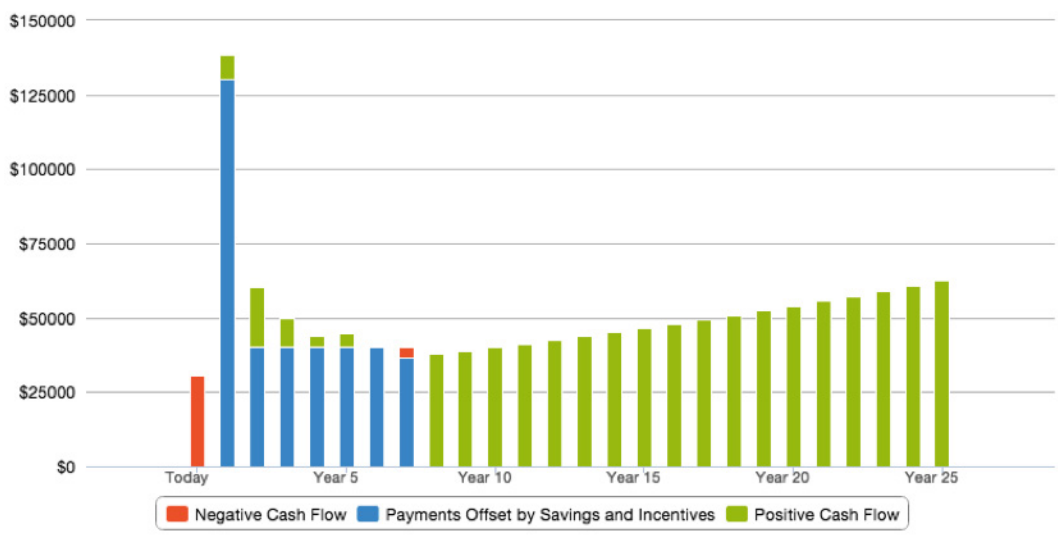
Lifecycle Savings	Investment	Annual Savings	Simple Payback
$1,001,717	$120,749	$30,787	3.9yrs
	Increase in Facility Value	IRR	NPV
	$384,836	28.39%	$352,001

Expected Life: **25.0 years**

Edit rates: Cap Rate: **8.00%** Utility Escalation Rate: **3.00%** Discount Rate: **7.00 %**

Example Noesis Financing Cash Flow

Term: 7 years Annual Payment: **$40,124** Avg. Annual Cash Flow: **$6,327**



Year	Savings	Tax Benefits/ Incentives	Payments	Down Payment	Payments Offset by Savings and Incentives	Cash Flow
1	$30,787	$107,850	$40,124	$90,000	$130,123	$8,514
2	$31,710	$28,560	$40,124		$40,124	$20,147
3	$32,662	$17,136	$40,124		$40,124	$9,674
4	$33,642	$10,282	$40,124		$40,124	$3,800
5	$34,651	$10,282	$40,124		$40,124	$4,809
6	$35,690	$5,141	$40,124		$40,124	$707
7	$36,761		$40,124		$36,761	($3,363)
8	$37,864		$1		$1	$37,863
9	$39,000					$39,000
10	$40,170					$40,170
11	$41,375					$41,375
12	$42,616					$42,616
13	$43,895					$43,895
14	$45,212					$45,212
15	$46,568					$46,568

Now, the project economics are compelling. The favorable tariff further increased the IRR of this project 3x more to 28% and a payback of 3.9 years. The project, which once seemed to make little economic sense, now looks extremely attractive.

Utility Incentives

Lastly, local grants and utility incentives play a very important role in improving the economics of a solar project. Many areas offer significant incentives that can help reduce the overall cost of the project, and often the incentives do not reduce the cost basis for the tax benefits. These can often help a 'good' project become a 'great' project.

Some areas have incentives that equal up to 50% of the cost of the system. In this example, let's be conservative and assume the local utility pays an incentive equal to 10% of the cost of the system and that the developer takes assignment of the incentive, which reduces payments.

Taking all the tax benefits and utility incentives into account, the final financed amount and net investment to the borrower would look like this:

A	Gross Cost	$300,000	given
B	Tax Rate	35.00%	given
C	Utility Incentive	$30,000	given
D	Federal ITC (down payment)	$90,000	A x 30%
E	Tax Liability	$10,500	B x C
F	Federal ITC less Tax Liability	$79,500	D - E
G	Total MACRS Value	$89,250	A x 85% x B
H	Value of Alll Benefits	$198,750	C + D + G
I	Financed Amount	$180,000	A - C - D
J	Borrower Investment	$101,250	A – H

When you combine all the incentives into the cash flow model, the economics of the project look like this (next page):

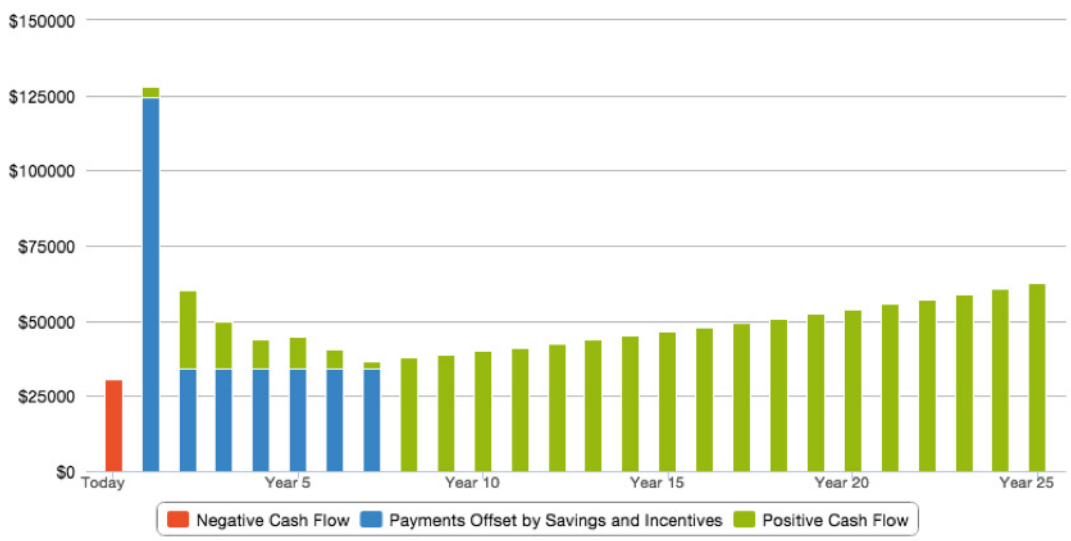
Lifecycle Savings	Investment	Annual Savings	Simple Payback
$1,021,217	$101,249	$30,787	3.3yrs
	Increase in Facility Value	IRR	NPV
	$384,836	33.36%	$371,501

Expected Life: **25.0 years**

Edit rates: Cap Rate: **8.00%** Utility Escalation Rate: **3.00%** Discount Rate: **7.00 %**

Example Noesis Financing Cash Flow

Term: 7 years Annual Payment: **$34,392** Avg. Annual Cash Flow: **$10,559**



Year	Savings	Tax Benefits/ Incentives	Payments	Down Payment	Payments Offset by Savings and Incentives	Cash Flow
1	$30,787	$97,350	$34,392	$89,999	$124,391	$3,746
2	$31,710	$28,560	$34,392		$34,392	$25,878
3	$32,662	$17,136	$34,392		$34,392	$15,406
4	$33,642	$10,282	$34,392		$34,392	$9,532
5	$34,651	$10,282	$34,392		$34,392	$10,541
6	$35,690	$5,141	$34,392		$34,392	$6,439
7	$36,761		$34,392		$34,392	$2,369
8	$37,864		$1		$1	$37,863
9	$39,000					$39,000
10	$40,170					$40,170
11	$41,375					$41,375
12	$42,616					$42,616
13	$43,895					$43,895
14	$45,212					$45,212
15	$46,568					$46,568

CONCLUSION

As you can see from these examples, solar can make a sound investment, but it often depends on your tax appetite, the utility rates and local incentives and programs. It's critical to understand how each contributes to the business case, as often seemingly unfeasible projects are actually highly attractive investments.

How Noesis Helps Accelerate the Solar Sales Process

Noesis provides simple and straightforward financing for commercial solar projects, finally allowing building owners to increase their investment in solar systems. With Noesis, commercial solar financing has never been easier or more accessible.

Noesis Solar Performance Agreement (SPA) finances commercial solar projects through basic capital leases and financing agreements that are designed to keep the project cash flow neutral through the loan period. Ideal for projects less than $1mm that are not good fits for PPAs or PACE financing, Noesis SPA is simple to understand and can be arranged and funded in days.

Want to learn more? **Contact us here.**

About the Author: Achai Broner

Achai is an energy efficiency professional with 15-years of experience in the field. With an engineering background and an MBA, he specializes in making the business case for energy efficiency projects through financing. Achai is the Director of Energy Projects at Noesis, and works with partners to prepare their projects to present to borrowers and lenders. He is a member of the Association of Energy Engineers and a Certified Measurement and Verification Professional (CMVP).