Cost Analysis of Modern Residential Solar Installations

Alex Adams, B.S. Construction Management
California Polytechnic State University
San Luis Obispo, California

This paper is a detailed cost analysis of standard photovoltaic panels and Tesla's solar tiles. This analysis is specifically for the San Luis Obispo area, and focuses on comparing and contrasting new and old styles of residential solar for the average single family dwelling. This is important because there will become more consumers of solar in this area as the price becomes more favorable, and as sustainable practices become the norm. This trend is set to continue because of the movement to combat climate change. Solar energy fits into this movement because it is a source of energy that is emissions free, and seamlessly ties into our national electric grid to slow the use of other harmful energy sources such as natural gas and coal. This cost analysis focuses on the initial cost to the home owner, the total life of each system, government subsidies and tax benefits of owning solar, and relevant finance and interest rates. The paper focuses on four main scenarios confronting a home owner considering installing solar on their home. The cost analysis is based on the assumption that it is a guide for the median home owner with the average electric bill, average available roof area, and average roof shading. Finally, this paper is a definitive guide for potential solar consumers, and details the challenges, risks, and outcomes of buying and installing solar in a residential setting.

Key Words: Solar Energy, Photovoltaic Panels, Tesla Solar Tiles, Residential Construction

Introduction

For the past few decades, solar power has become more available to consumers and regions for use. It has become economical to buy and install. The reason for this is that ever since climate scientists agreed on human accelerated climate change, people have become aware of the threats that climate change has on our environment and our way of life. This has triggered a movement to combat climate change, by trying to find new sources of green energy. These new sources of energy, besides solar, include wind, tidal, and geothermal. All of these sources are green and emission free, but they have their limitations. The major energy of our green future is solar powered. One of the best ways to contribute to this battle is to add solar to your own home, but not only will it help save the environment, it may help save you money as well. In the past there was really only one option, and that was the photovoltaic panel, or PV panel for short. Now, there is a new product on the market by Tesla that plans on changing the way solar looks.

This product is called the Tesla Solar Roof. It consists of small sheets of solar cells embedded into glass tiles. These tiles are made to look as though they are traditional clay or slate roofing tiles. The solar roof is made of two different types of tiles: solar and non-solar. This gives the home owner the ability to choose the most efficient ratio of solar to non-solar tiles for their specific home. These tiles will look identical from the street, and will give the Tesla product a clear cosmetic advantage over the traditional PV systems. The tiles come with the best wind, hail, and fire ratings, and come with a thirty year warranty. Another advantage that the solar roof has, is that it comes with an optional Tesla Powerwall which is able to store excess power while energy in your home is not being used. This will give the consumers houses off the grid availability, which will allow the house to keep running even during a blackout. Unfortunately, the cost of this system does not include significant structural upgrades to the home, gutter or skylight replacement. Having to do structural upgrades is a concern because not all homes are rated for a structural load big enough to hold up heavy glass tiles, and adding extra beams to a home could add to the cost of the roof by thousands of dollars. This new product sets itself into place as the sleekest option on the market, but is it cost effective enough to outweigh its competitors?

Methodology

The objectives of this cost analysis are as follows:

- Describe my intended market audience.

- Research the market demand for these systems.
- Describe the economic benefits of residential solar products.
- Compare and contrast the Tesla Solar Roof, and Photovoltaic panels from the lowest cost source.
- Perform a present value analysis on various different scenarios.
- Report on lessons learned.

The methodology involved with this cost analysis is mainly quantitative. The information that is used for this cost analysis was gathered from online scholarly databases, publications, and prices from real solar installers for a hypothetical home. The information is used to analyze the positive and negative economic tendencies of the two products. Relevant variables are compiled, and manipulated to describe long term cost. The evaluation of cost alternatives is calculated using present worth analysis. Cash flow diagrams are prepared to easily show year to year present value for the lifetime of each system. The cash flow diagrams will be created using a pre-made excel sheet that actively tracks initial outlay/investment, discount rate, income/savings, and expenses.

Cost Analysis

As I stated earlier, my intended market audience for this cost analysis are the residents of San Luis Obispo County. It is important to specify this setting because when it comes to some of the variables used in the cost analysis, they will be fairly different compared to other counties in the state of California and considerably different compared to other states and countries. I would also like to specify that this paper is catered to current residents that want to own their solar tiles or panels out right. There are other methods of getting solar that do not involve paying in full for the system. These alternative plans include solar leasing, and power purchasing agreements. These alternatives will not be covered.

I will start this analysis by showing why there is a large market demand for solar energy in San Luis Obispo, and showing what current residents should expect when inquiring about solar for their home. According to the California Energy Commission, California leads all states in residential solar use, and San Luis Obispo County is the sixteenth ranked County in California. This puts San Luis Obispo right behind San Francisco County in residential solar use with 5.2 megawatts installed as of March 7, 2018. This shouldn't come as a surprise because of the county's sunny climate, large population of typically affluent residents, and the social encouragement to live a green lifestyle. This number shows that there is room for improvement, and that as solar continues to drop in price, more consumers will emerge. But there are a few more reasons for local residents to get excited about owning their own solar installation. There are economic benefits from the Federal Residential Renewable Energy Tax Credit, California Solar Initiative, and Net Energy Metering. These benefits were designed to encourage solar energy use, so that we could start to phase out our dependence on fossil fuels, and other types of energy generation that are either dangerous to ourselves or our environment.

The Federal Residential Renewable Energy Tax Credit started out as the Energy Policy Act of 2005, and evolved with the inclusions of the Energy Improvement and Extension Act of 2008, and the American Recovery and Investment Act of 2009. These acts allow a taxpayer to claim a thirty percent credit on expenses having to do with solar electric property, solar water heating systems, fuel cells, small wind energy, and geothermal heat pumps. In regards to solar electric property specifically, this act allowed taxpayers to receive credit for solar electric systems placed into service after the start of 2006. Recently, The Bipartisan Budget Act of 2018 introduced in February, 2018 sees a massive change to the policy. The change outlines the future of this tax credit for the next four years. 2018 and 2019 will remain the unchanged from with the thirty percent tax credit staying intact. From 2020 to the start of 2021 the tax credit will be lowered to twenty six percent, and in 2021 to the start of 2022 sees another decline in tax credit to twenty two percent. By 2022 the policy is planned to be revisited, and reevaluated once again. This could foreshadow the end of the federal tax credit all together, or see it lowered further beyond 2022. The change in the maximum allowable tax credit for solar systems is a response to the lowered cost of these systems in general. It may show that our government is confident that the prices to buy and install solar energy products will continue to decline in the coming years. It could also have to do with our current presidential administration's stance on renewables, and their commitment to energy resources such as coal and natural gas. What this means for consumers now, is that any time before the end of 2019 could be the best possible time to buy and install renewable energy equipment for the foreseeable future. This information is valuable for my market audience because this is the best time to start looking into solar energy for their homes. An important thing to note, is that if you do not pay 30% of your system cost in taxes, you will only be able to claim as much as you pay in taxes that year.

Another important government program for my market audience is the California Solar Initiative. In 2007 the Go Solar Campaign raised over $2.1 billion dollars to help incentivize residential and small commercial solar energy. Customers of local California utilities, such as PG&E, SCE, and SDG&E, would be reimbursed on their installations based off of expected performance based buy down. This program ended up counting approximately 1,900 megawatts worth of systems, and its payout of over $1.9 billion dollars in incentives. The program utilized a stepped approach to pay outs. Early in the program, when few systems had been installed, CSI was paying over $2.50 per watt that was scheduled to be installed. At the end of the program, after 1,400 megawatts worth of systems had been installed, CSI was only paying around $0.25 per watt. This was the tenth step in the program, with each step declining in payout rate. This incentivized early adopters, while the price of solar arrays were still high. Unfortunately for my market audience, this program was closed at the end of 2016. The end of this program could be a deterrent for home owners to consider investing in solar energy for their homes. There is a low chance that another program similar to this one will meet the consumers, but it may be needed to incentivize other homeowners that are not currently motivated to invest at the current price point.

The California Solar Initiative was considered a massive success, and helped make solar energy more affordable for thousands of families. The general market program described above was not the only program designed by the Go Solar Campaign. The campaign also featured programs like the CSI Thermal Program, which paid out similar rates to consumers that invested in solar hot water. Other programs designed were the Single Family Affordable Solar Homes program (SASH), and the Multifamily Affordable Solar Homes (MASH) program. These programs were designed to benefit low income residents, and developers investing in solar for their multifamily affordable housing projects. The last program designed by the Go Solar Campaign was a grant program called Research, Development, Demonstration, and Deployment of Solar Technologies. This was designed to gather greater public interest in solar energy by showing the cutting edge equipment, and researching new ways to lower system cost, and raise system efficiency. Now that CSI is officially over, you will have to look towards the local utilities provider for other rebate programs.

The local utilities provider in San Luis Obispo County is Pacific Gas and Electric (PG&E). PG&E have partnered up with the California Energy Commission to introduce the New Solar Homes Partnership (NSHP). This program was designed to encourage home builders, and consumers looking to build a custom home, to build a new home that utilizes solar energy and other green technologies. Specifically targeting clean, renewable energy, utility bill savings, predictable utility costs, and protection against rising electricity costs. So far, this program has paid out around $300 million dollars in rebates, with 93 thousand systems installed. That comes out to around $3,200 dollars per system in savings. After 2016, this program was promised to continue through at least 2021. Unfortunately, this particular rebate plan does not totally effect my target audience because not only would they have to build a whole new home, the home would have to utilize energy saving and eco-friendly products, like insulation, efficient lighting, low flow water products, and high quality windows and doors. Even if this does not directly influence my target audience, there are people in San Luis Obispo County that are looking into building their own home, and my cost analysis can still apply, but it will not take into account the price of a new home, or the cost of buying land.

Possibly the best thing that PG&E offers, is their competitive Net Energy Metering program. This program allows solar owners to have a two-way meter installed in their home. This meter will track and add up your electricity use just like any other meter, but it will also subtracted electricity use whenever your solar module is producing more electricity than your house is using. This only works if your solar panels are hooked into the electricity grid. If your PV installation is large enough, and produces more electricity than you use, at the end of the year, you will receive a check for the surplus amount of electricity generated times the twelve month average market rate for electricity in your area. Originally, customers could choose to be paid out month to month for their electricity generation, but since the California State Assembly Bill 920 was enacted, PG&E is legally allowed to pay out customers on a twelve month billing cycle. According to Energy Sage, a website run by the U.S. Department of Energy, the rate at which PG&E will bill customers back is around $0.03 per kilowatt hour. This rate is set by the California Public Utilities Commission.

Recently, PG&E has designed a new rate plan called Time of Use. This plan will allow your electricity rate in cost per kilowatt hour to fluctuate during different times of the day. This means that the rate at which you are charged for electricity is lower during the night, mornings, and weekends. The rate at which you will be charged during peak hours of week days, from 3 p.m. to 8p.m., will be higher. This plan is good for people that are generally not home in the afternoon, or can abstain from using electricity during peak hours. The caveat is that electricity sold back to PG&E during these times will be charged at these rates as well. In theory, if a Tesla Solar Tile customer were to store all of their energy made during the sunny hours of the day in a Tesla Powerwall, they could possibly figure out a way to transmit it back to PG&E during peak hours, to always get the higher rate. Unfortunately, I could not find any documents to fully support this theory, and that is why I will use the aforementioned $0.03 per kilowatt hour rate as my baseline. Another reason to stay with that baseline is because a study conducted by the National Bureau of Economic Research by Severin Borenstein says that because of the inefficiency of power plants being able to adapt to consumer solar use during peak hours, only "about 30% of the PV generation would be injected into the grid." This means about 70% of net energy gets utilized, and as more studies and data verify this, price per kilowatt hour could go down as a result.

Now that we have talked about government rebates, and utility buy back, we can get into the system specifications. I will start with the Tesla Solar Tiles and then move on to a typical PV panel installation. Since the Tesla product is new, there was a low amount of field data available for research, but there is still enough theoretical data to compare to the plethora of data concerning its competitor. Naturally, I started my research of the Tesla Solar Roof at the Tesla Website. The website offered a "Customization" option that allowed you to plug in numbers into boxes for zip code, square footage of your home, the roof size, and your current electric bill. Even though I do not own a home myself, I decided to give it a test run with numbers you would find concerning a typical home in San Luis Obispo. The home that I described was a single story, with 1,600 square feet of living space, and a roof of 2,000 square feet (accounting for a 3:12 slope). According to the United States Energy Information Administration, the average electric bill in California is around $94 (average price is 17.39 cents), but a home of 1,600 square feet, in most cases, will provide electricity for three or four people, which will increase the bill about 150% to $141. From these variables, Tesla was able to provide customized information about the hypothetical solar roof. Tesla recommends that the home has about 20% solar tiles, and 80% normal tiles. Because each tile has an exposure of 14"x 8.65", each tile covers about 0.84 square feet. That means a 2000 square foot roof would need at least, 2381 tiles. With 20% of these being solar tiles, that means that 477 of the tiles on the roof will create electricity. Greentech Media suggests that the maximum amount of electricity each tile can produce is 6 watts, so this roof would be considered a 2.8 kilowatt solar installation. The upfront cost of this system including the power wall, and including the federal tax credit is $29,260.

In a paper called "Here comes the sun; Trying to make solar energy pay in the short run," the author, Keenan, calculates how much a system in Massachusetts would save per month. Even though Keenan lives in another state, the way savings are calculated are similar. Since we already know the system size, and our average electric bill, to find the average kilowatt hours of electricity produced per month, we need to know some weather data. According to weatherspark.com, there is about 12 hours of sunlight per day year round in San Luis Obispo. In the summer there is more, and in the winter there is less, but on average there is about twelve. They also say that there are no clouds about 70% of the time, so on average there is 8.5 hours of sun per day. Now, to get the average kilowatt hours of electricity produced per month, you multiply the system size by the hours of sun per day, by thirty days in a month. When you do this for our Tesla Solar Roof, you get a system that approximately makes 714 kilowatt hours per month. Compare this to the amount of electricity used per month in this home ($141 per month / $0.1739 per kilowatt hour = 811 kilowatt hours per month), and we find that this solar roof will supply about 88% of the home's electricity needs. The system will save the home owners $124 per month and about $1490 a year. I decided not to use some the numbers that Tesla came up with for me for a few reasons. First, I was unable to verify how they compiled their information. Second, some of it seemingly contradicted what I had previously researched. And third, I would like the source information from the Tesla estimate and the PV estimate to be the same.

For the traditional PV panels, I received three quotes from solar subcontractors in the San Luis Obispo area. The three companies were Solarponics Incorporated, Photon Brothers, and Sun Works. The low bidder on the hypothetical project with the same specs were Solarponics. They gave me a competitive price at $3.00 a watt. The overall system costs of $9,900, but with the federal ITC, the upfront cost is lowered to $6,930. The system that they designed for me includes standard panels made by REC Americas. They proscribed a system with 10 panels with a 330 watt per panel efficiency. That makes it a 3.30 kilowatt system. Using the same formula from before, we conclude that this system will create 842 kilowatt hours of electricity per month, and it will save the home owners $146 per month and about $1752 per year. Unfortunately for this model, it suffers from rapid output decline. After the first year, it is projected to decline 3%, and 0.7% subsequent years after.

Now that we have specifications for both systems being compared, all we need now are loan rates and interest rates. Most American home owners do not have enough savings in their bank accounts to pay the upfront costs of either systems outright. This is where bank loans come into play. The type of loan that solar buyers will be after is a home loan. According to bankrate.com, a competitive home loan for someone with good credit is a flat rate loan of 4.0% for 15 years, and no money down. They also provided the current interest rate at 2.0%. With these rates in place, I can now calculate the expenses per year. The expenses will be shared equally over the 15 years of the loan. See below on how to calculate the loan payments per year.

N = 15 years x 12 months per year = 180 months
I = 0.045 / 12 months per year = 0.00375
Discount Rate = [(1 + 0.00375) ^180 – 1] / [0.00375 (1 + 0.00375) ^180] = 130.72
Payments per year = (Total System Cost after 30% tax credit / 130.72) (12 months per year)

To compare the two systems, I have broken them down into six different scenarios. These scenarios are situations that a typical home owner will find themselves in when looking to make the switch to solar energy. The first scenario involves buying the Tesla Solar Tiles and the Power Wall at the same time. The second scenario involves only buying the Solar Tiles. Remember that for the first two scenarios, the Tesla product is an entire roofing system that takes into account roofing your home with the solar and non-solar tiles. Breaking the first two scenarios up was an important distinction to make because the upfront cost of the Power Wall is over $7,000, and is not completely necessary for the success of the system. The third scenario involves buying only PV panels from Solarponics. The fourth scenario involves buying the PV panels from Solarponics, and buying a new roof for them to go on. It was important to break up these two scenarios because not everyone needs a new roof, and to best compare the conventional to the Tesla product I have to assume that the consumer needs a new roof. For scenario four, I used a website called roofpedia.com to estimate the cost of a new roof to be around $10,000. For scenarios five and six, I will be scaling down the system size of the PV panel scenarios to a system size the same as the Tesla scenarios.

Scenario 1

Solar Tiles + Power Wall

INITIAL OUTLAY/INVESTMENT | $0.00
DISCOUNT RATE | 2%

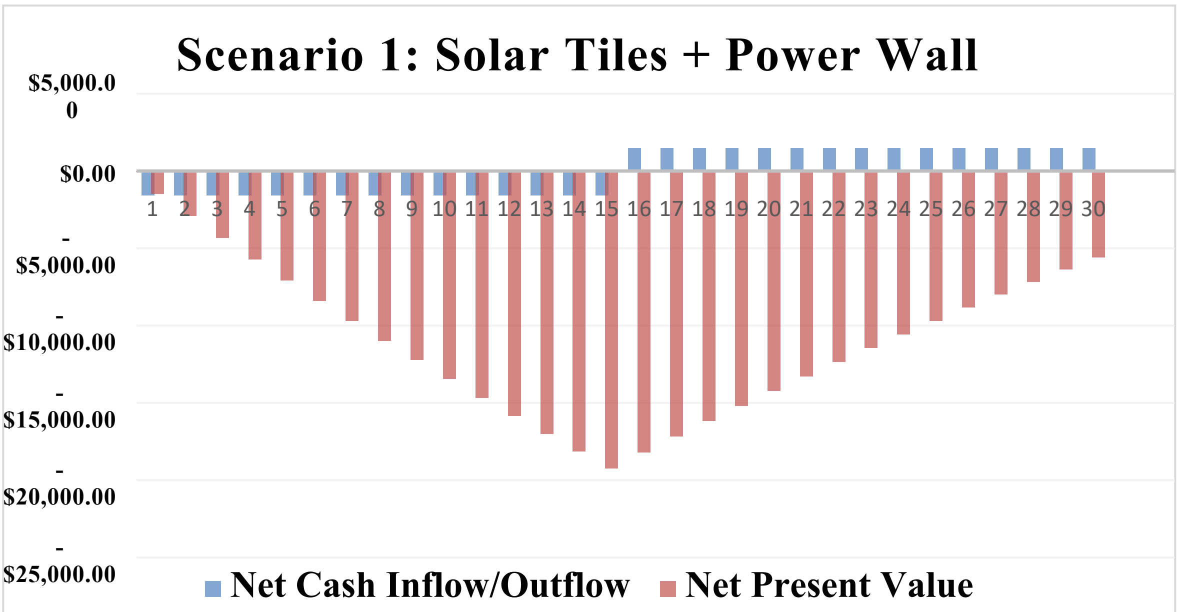
	INCOME	EXPENSES				DISCOUNTED CASH FLOW			
Year	Cash Inflow	Fixed Cost	Variable Cost	Cash Outflow	Net Cash Inflow/Outflow	Present Value of Cash flow	Cumulative Present Value of Cash Inflow	Present Value	Net Present Value
1	$1,490.00	$3,048.00		$3,048.00	-$1,558.00	-$1,527.45	-$1,527.45	-$1,527.45	-$1,468.14
2	$1,490.00	$3,048.00		$3,048.00	-$1,558.00	-$1,497.50	-$3,024.95	-$3,024.95	-$2,907.49
3	$1,490.00	$3,048.00		$3,048.00	-$1,558.00	-$1,468.14	-$4,493.09	-$4,493.09	-$4,318.62
4	$1,490.00	$3,048.00		$3,048.00	-$1,558.00	-$1,439.35	-$5,932.44	-$5,932.44	-$5,702.08
5	$1,490.00	$3,048.00		$3,048.00	-$1,558.00	-$1,411.13	-$7,343.57	-$7,343.57	-$7,058.41
6	$1,490.00	$3,048.00		$3,048.00	-$1,558.00	-$1,383.46	-$8,727.03	-$8,727.03	-$8,388.15
7	$1,490.00	$3,048.00		$3,048.00	-$1,558.00	-$1,356.33	-$10,083.36	-$10,083.36	-$9,691.81
8	$1,490.00	$3,048.00		$3,048.00	-$1,558.00	-$1,329.74	-$11,413.10	-$11,413.10	-$10,969.92
9	$1,490.00	$3,048.00		$3,048.00	-$1,558.00	-$1,303.66	-$12,716.76	-$12,716.76	-$12,222.96
10	$1,490.00	$3,048.00		$3,048.00	-$1,558.00	-$1,278.10	-$13,994.87	-$13,994.87	-$13,451.43
11	$1,490.00	$3,048.00		$3,048.00	-$1,558.00	-$1,253.04	-$15,247.91	-$15,247.91	-$14,655.81
12	$1,490.00	$3,048.00		$3,048.00	-$1,558.00	-$1,228.47	-$16,476.38	-$16,476.38	-$15,836.58
13	$1,490.00	$3,048.00		$3,048.00	-$1,558.00	-$1,204.38	-$17,680.77	-$17,680.77	-$16,994.20
14	$1,490.00	$3,048.00		$3,048.00	-$1,558.00	-$1,180.77	-$18,861.54	-$18,861.54	-$18,129.12
15	$1,490.00	$3,048.00		$3,048.00	-$1,558.00	-$1,157.62	-$20,019.15	-$20,019.15	-$19,241.78
16	$1,490.00			$0.00	$1,490.00	$1,085.38	-$18,933.77	-$18,933.77	-$18,198.55
17	$1,490.00			$0.00	$1,490.00	$1,064.10	-$17,869.67	-$17,869.67	-$17,175.77
18	$1,490.00			$0.00	$1,490.00	$1,043.24	-$16,826.43	-$16,826.43	-$16,173.04
19	$1,490.00			$0.00	$1,490.00	$1,022.78	-$15,803.65	-$15,803.65	-$15,189.97
20	$1,490.00			$0.00	$1,490.00	$1,002.73	-$14,800.92	-$14,800.92	-$14,226.18
21	$1,490.00			$0.00	$1,490.00	$983.07	-$13,817.85	-$13,817.85	-$13,281.29
22	$1,490.00			$0.00	$1,490.00	$963.79	-$12,854.06	-$12,854.06	-$12,354.92
23	$1,490.00			$0.00	$1,490.00	$944.89	-$11,909.17	-$11,909.17	-$11,446.72
24	$1,490.00			$0.00	$1,490.00	$926.37	-$10,982.81	-$10,982.81	-$10,556.33
25	$1,490.00			$0.00	$1,490.00	$908.20	-$10,074.61	-$10,074.61	-$9,683.40

The table above is an example of which financial excel sheet I used when doing this cost analysis. This table happens to be of scenario one, Solar Tiles and Power Wall. Each scenario used the same initial investment and discount rate, but the income and expenses is where the scenarios differed. Scenario one and two had the same income per year, and so did scenario three and four. This is because income in this situation is another word for savings per year on electricity costs. All scenarios have different fixed costs. The fixed costs represent the estimated cost per year in loan payments. These loan payments were estimated from the upfront costs minus the federal tax rebate.

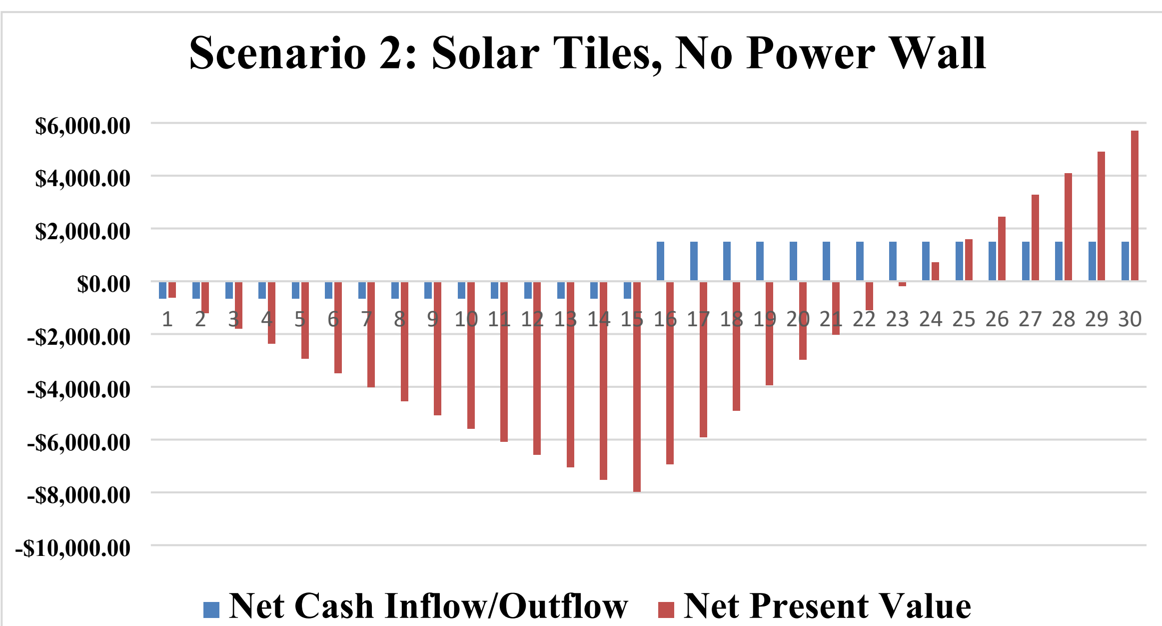
After I constructed the tables for each scenario, I made cash flow graphs for each one that combined Net Cash Inflow/Outflow, and Net Present Value. Net Cash flow is important because it shows the potential consumer how much money they will be taking in, or paying back over the course of the life of the system. NPV is important because it shows how well your money does over time while taking into account interest rates and inflation. You can see these graphs below, and look at how each scenario plays out over time.

NPV is the cumulative present value of the cash inflows – cumulative present value of the cash outflows
NPV is calculated using the excel formula:

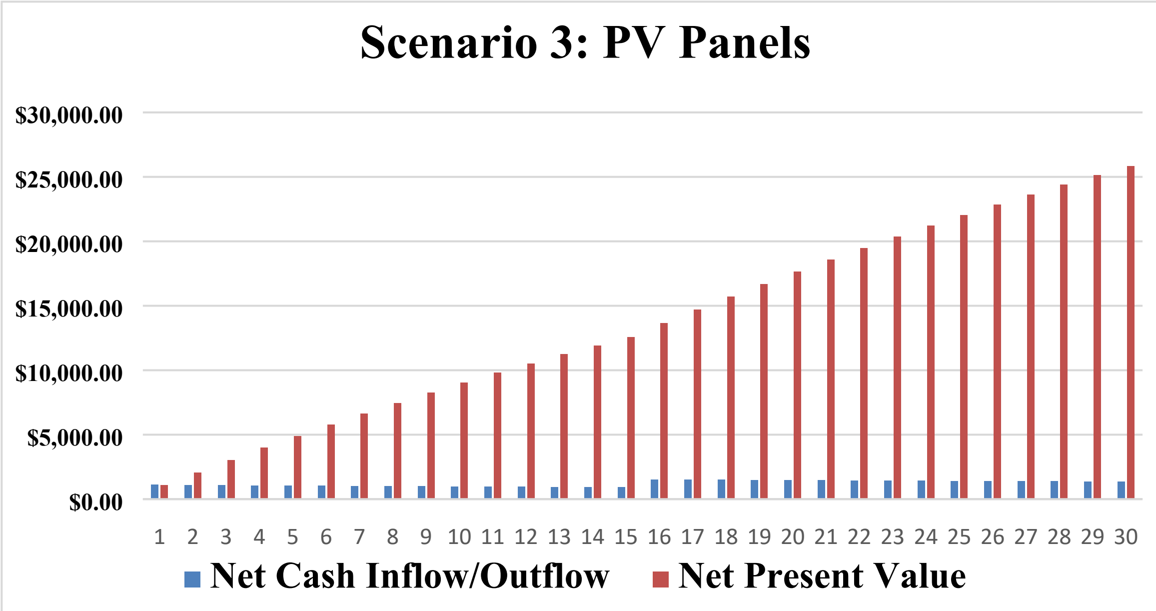
=NPV(DiscountRate,-InitialInvestment,[@[Cumulative Present Value of Cash Inflow]])



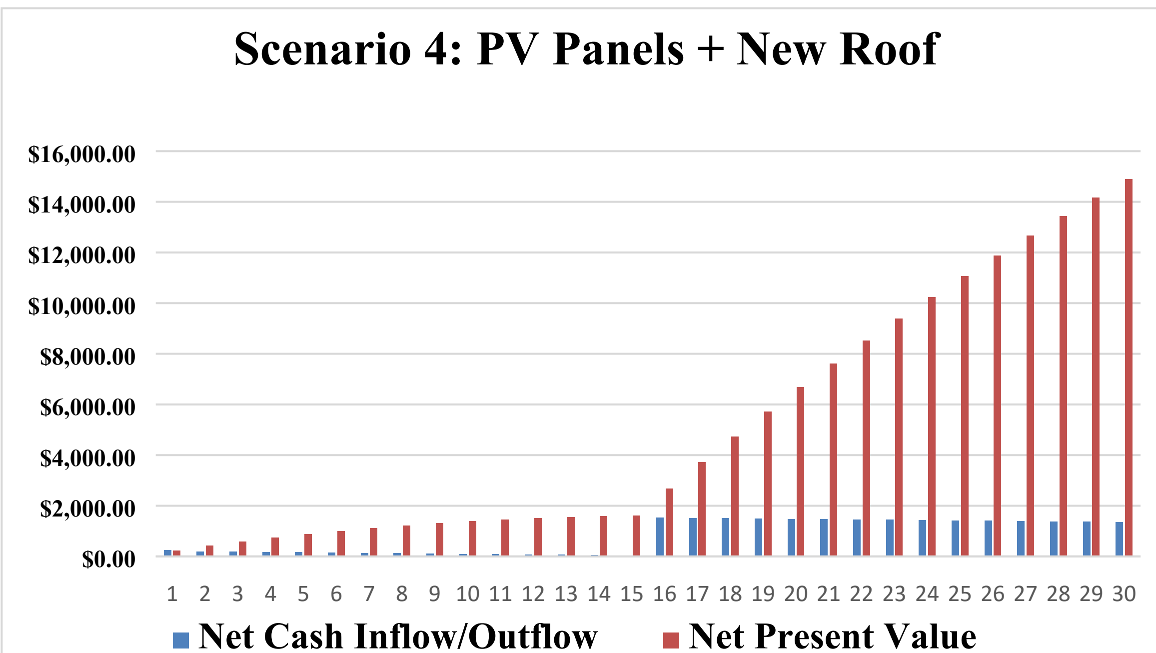
Scenario 1:
NPV = -$5,568 System Size = 2.8 kilowatts Total System Cost = $29,260



Scenario 2:
NPV = $5,694 System Size = 2.8 kilowatts Total System Cost = $24,080

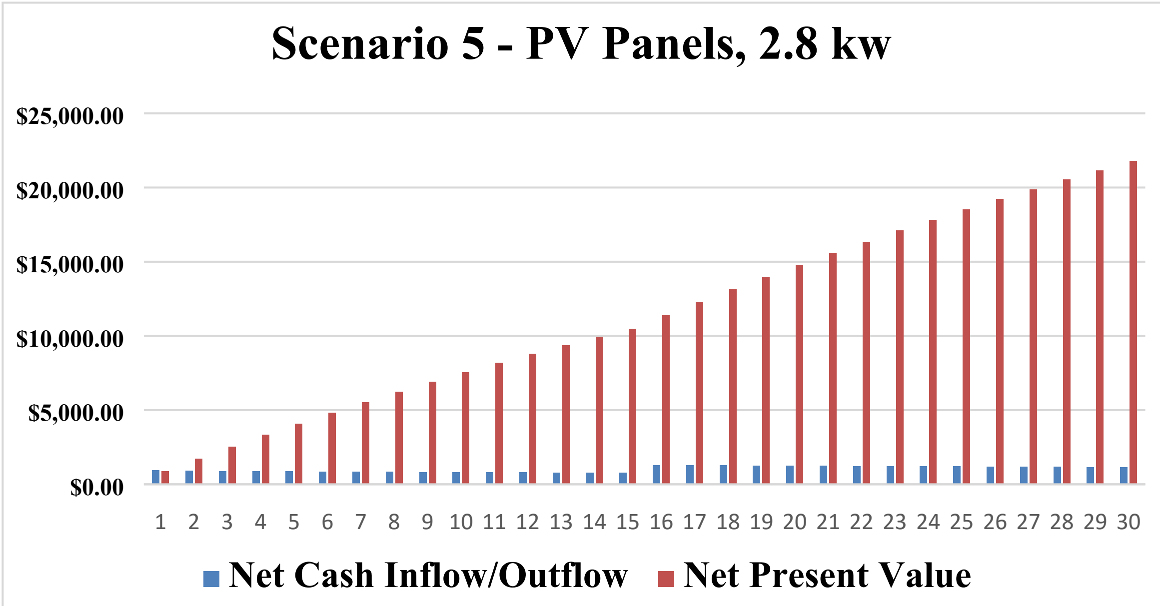


Scenario 3:
NPV = $25,849 System Size = 3.3 kilowatts Total System Cost = $6,930

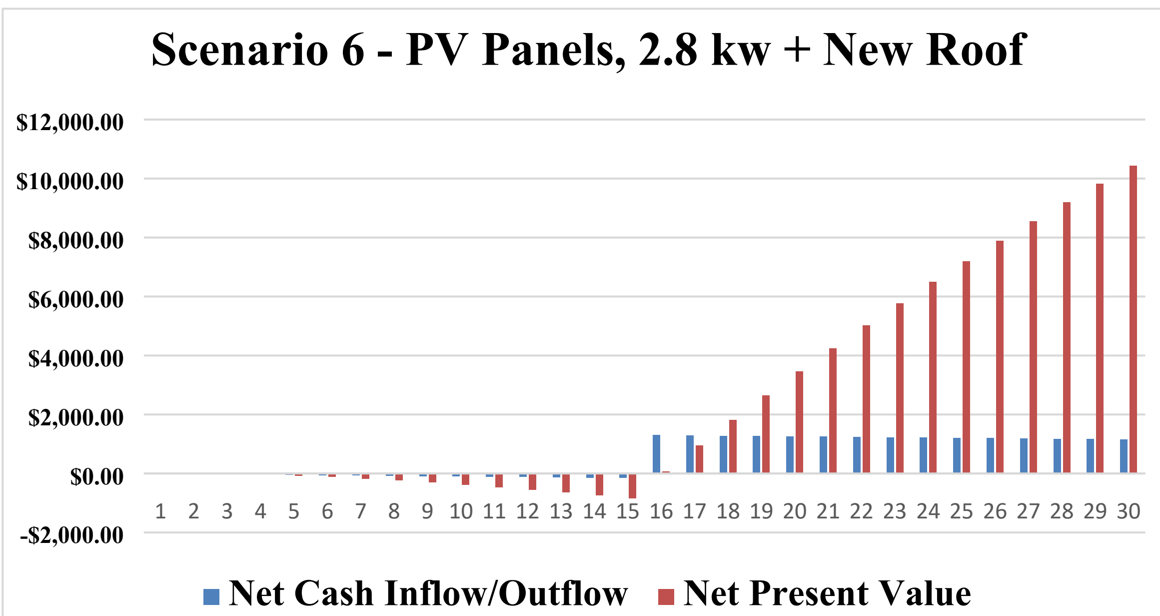


Scenario 4:
NPV = $14,886 System Size = 3.3 kilowatts Total System Cost = $16,930

For my last two scenarios, I would like to see how the NPV is effected if I normalize the system size. I will do this by slightly changing scenarios three and four. For scenarios three and four, the NPV was calculated using a system size of 3.3 kilowatts. For scenarios five and six, I lowered the system size down to 2.8 kilowatts. I did this by taking the price per watt of the PV panels ($3.00 per watt) and multiplied it by 2,800 watts to get a system cost of $8,400. Next, I multiplied the system cost by 0.7 to account for the 30% federal tax credit which got me a total system cost after tax of $5,880. For scenario 5, I then found the relevant loan payment to be $539.80 a year by dividing the total system cost after tax by the discount rate found earlier (130.716) and multiplying by 12 months a year. For scenario 6 I had to add a step by adding the price of a roof to the total system cost after tax to get $15,880, then doing the same steps as before, I get $1,457.82 a year in loan payments.



Scenario 5:
NPV = $21,778 System Size = 2.8 kilowatts Total System Cost = $5,880



Scenario 6:
NPV = $10,440 System Size = 2.8 kilowatts Total System Cost = $15,880

Conclusion

While looking at the graphs above, it is hard not to notice the glaring lack of return of scenario 1. With the NPV at 30 years being -$5,568, anyone can see this being a poor investment. Compared to its sister scenario, scenario 2, we notice that the NPV at 30 years is $5,694. This is in direct correlation to not installing a power wall with the solar tiles. At this point I can conclude that the power wall is not a worthy investment for a home owner in San Luis Obispo. Scenario 1 is really only viable for someone in a country with less reliable electricity. The two scenarios that are most important for this research, are scenario 2 and 4. These are the most relatable because they both involve buying a new roof, and new solar. As we can see, scenario 4 is a better investment by over $9,000. Scenario 3 was added to this cost analysis because it was to show the consumer that if they did not need a new roof, the new Tesla product was not the one for them. When I performed scenario 5 and 6, it showed that when you lower your system size, it will lower your return on investment. It is important to utilize roof space efficiently to use a system that is perfect for your home. It also showed that when the system sizes are equal, the Tesla and the PV Panels are closer together in return. In conclusion, The Tesla Product shows that it under performs against a conventional PV system. This could be helped by having a lower system cost, higher solar panel efficiency, lower loan rates, and a higher price of electricity. As time passes, we could see the Tesla product's upfront cost go down, but it is important to remember that government tax credits will soon diminish, and the consumer will soon have to pay the brunt of upfront cost by themselves.

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