

# #1 Question Lurking Within Every Inquiry About Photovoltaics:

## How Much does a Photovoltaic System Cost?

The #1 answer needs to first start out by answering a question with a question:

## Compared to WHAT?????????

**How can anyone assess that Apples might cost more Oranges without first knowing the cost of Oranges?**

While most people know what their monthly electric bill is, almost no one has calculated their lifetime costs.

Photovoltaics are a once-per-lifetime investment.

In order to assess costs, lifetime-apples-to-lifetime-oranges, we need to understand how much we'll pay the utility over our lifetime.

From the top row of the table below, identify the amount which most closely matches your average electric bill.

Follow the column down as many years as you've been paying - and down further to as many years you expect to continue to pay.

The number in the box represents the cumulative expense from year to year.

The typical home is reported to consume 30 kWh's/day which at current rates amounts to \$135/month.

At this rate, a young family starting out in their mid 20's and planning to live a full life into their 90's will have paid the utility over \$373,000.

### "Experts" say:

*Solar is too expensive.*

*Solar can't compete with oil, coal and natural gas.*

*Solar may be a sign of personal virtue, but it is not a sufficient basis for a sound, comprehensive energy policy.*

With \$373K lifetime costs, do you feel **YOUR** family energy policy is *sound and comprehensive*?

With this data now in hand, you are in an informed position to accurately absorb and assess the costs associated with **OWNING** your energy as opposed to *renting* it monthly from the utility.

Table data based on We Energies 2013 Residential rate of \$.13816/kWh, facilities charge of \$.30/day. Rate increases calculated at 3% per year.

Doubt that rates will increase 3% utilizing a finite resource amidst a growing demand? Since the mid 80's, Wepco rates have in fact risen 247%.

Still not convinced: Looking backwards 70 years, the \$1619/yr expense incurred in 2013 would have been just \$122 in 1943. (13.3 x).

The table below looks forward 70 years, calculating that a \$1619 expense in 2013 will cost \$12,226 in 2083. (7.6 x).

Point made: By historical standards, the 3% rate increase projected within this table is extremely conservative - 57% of historical reality.

**Cumulative Lifetime Utility Electric Costs**

If your Monthly Electric Bill is >		\$51	\$93	\$135	\$177	\$219	\$261	\$303	\$345	\$387	\$429	\$471	\$513
Yr	Utility Customer Age	10 kWh/Day Cummm Yr to Yr	20 kWh/Day Cummm Yr to Yr	30 kWh/Day Cummm Yr to Yr	40 kWh/Day Cummm Yr to Yr	50 kWh/Day Cummm Yr to Yr	60 kWh/Day Cummm Yr to Yr	70 kWh/Day Cummm Yr to Yr	80 kWh/Day Cummm Yr to Yr	90 kWh/Day Cummm Yr to Yr	100 kWh/Day Cummm Yr to Yr	110 kWh/Day Cummm Yr to Yr	120 kWh/Day Cummm Yr to Yr
1	26	\$612	\$1,115	<b>\$1,619</b>	\$2,123	\$2,626	\$3,130	\$3,634	\$4,138	\$4,641	\$5,145	\$5,649	\$6,152
5	30	\$3,248	\$5,922	\$8,596	\$11,270	\$13,944	\$16,619	\$19,293	\$21,967	\$24,641	\$27,316	\$29,990	\$32,664
10	35	\$7,012	\$12,787	\$18,561	\$24,336	\$30,110	\$35,884	\$41,659	\$47,433	\$53,207	\$58,982	\$64,756	\$70,530
15	40	\$11,377	\$20,745	\$30,114	\$39,482	\$48,850	\$58,218	\$67,587	\$76,955	\$86,323	\$95,691	\$105,060	\$114,428
20	45	\$16,437	\$29,971	\$43,506	\$57,040	\$70,575	\$84,110	\$97,644	\$111,179	\$124,713	\$138,248	\$151,783	\$165,317
25	50	\$22,302	\$40,667	\$59,031	\$77,396	\$95,760	\$114,125	\$132,489	\$150,854	\$169,218	\$187,583	\$205,947	\$224,312
30	55	\$29,102	\$53,066	\$77,029	\$100,993	\$124,957	\$148,921	\$172,884	\$196,848	\$220,812	\$244,776	\$268,739	\$292,703
35	60	\$36,985	\$67,439	\$97,894	\$128,349	\$158,804	\$189,258	\$219,713	\$250,168	\$280,623	\$311,077	\$341,532	\$371,987
40	65	\$46,123	\$84,103	\$122,082	\$160,062	\$198,041	\$236,021	\$274,001	\$311,980	\$349,960	\$387,939	\$425,919	\$463,899
45	70	\$56,717	\$103,420	\$150,123	\$196,826	\$243,529	\$290,232	\$336,935	\$383,638	\$430,341	\$477,044	\$523,747	\$570,450
50	75	\$68,998	\$125,814	\$182,629	\$239,445	\$296,261	\$353,077	\$409,893	\$466,708	\$523,524	\$580,340	\$637,156	\$693,971
55	80	\$83,235	\$151,774	\$220,314	\$288,853	\$357,392	\$425,931	\$494,471	\$563,010	\$631,549	\$700,088	\$768,628	\$837,167
60	85	\$99,740	\$181,870	\$264,000	\$346,130	\$428,260	\$510,390	\$592,520	\$674,650	\$756,780	\$838,910	\$921,040	\$1,003,170
65	90	\$118,873	\$216,759	\$314,644	\$412,530	\$510,415	\$608,300	\$706,186	\$804,071	\$901,957	\$999,842	\$1,097,727	\$1,195,613
70	95	\$141,054	\$257,205	<b>\$373,355</b>	\$489,505	\$605,655	\$721,806	\$837,956	\$954,106	\$1,070,256	\$1,186,406	\$1,302,557	\$1,418,707

# Typical Lifetime Cumulative Electric Utility Cost - Age 25 - 95 ... **\$373,355**

Write your Lifetime Cumulative Electric Utility Cost Here ... \$ \_\_\_\_\_  
 (Refer to the table on the previous page.)

Our first PV system was purchased in 1992, too long ago to have relevance to the current market.

What follows are the present day costs for our second PV system, purchased in 2010.

History - Photovoltaic \$/watt: **1992 \$7.00**    **2010 \$2.44**    **2013 \$0.70 - \$1.00**

Component	Purpose	Description	Cost - 2013
Photovoltaic Panels	Converts Sunshine to DC (direct current) electricity	8200 Watts	\$5740
Inverter	Converts DC to AC Synchronizes & interacts with utility	7000 watt 240VAC	\$3000
PV Rack	Mounts Panels to Structure	256 ft of mounting rails, hardware	\$2100
Balance of System	Connect components disconnects, misc.	Wire, conduit, disconnects, hardware, shipping etc.	\$1000
<b>Total Materials</b>			<b>\$11,840</b>

## Notes

PV pricing of \$0.70/watt based on an actual sale price from Go Green Solar which literally popped into my mailbox as I was writing this page. Non-sale pricing has typically been closer to \$1/watt. Bargain shoppers will find the bargains. U.S.A made panels cost more but you get what you pay for. Helios is made right here in Milwaukee with high quality panels priced at roughly \$1.25/watt.

Costs are for materials only. All installation labor was performed by me. I have no first hand data to provide labor estimates in the event you decide to have a system installed. Note that in 2010, the costs for the panels were 3 times the going rate in 2013\*.

This is to suggest that, for the same money that we paid for self-installation of our system, you may come close to achieving the same overall cost even if you pay for professional installation. Individuals that possess basic construction skills, moderate electrical skills AND are willing to spend the time necessary studying the NEC and back-issues of Home Power Magazine can successfully install a system. If you have a nervous local inspector, you may not be successful, or, you may have to document each and every decision with it's corresponding NEC chapter and verse. A professional installer will get the job done in 1/3 the time, probably with less material costs, give confidence to the inspector AND if there are any Focus On Energy-type incentives still available, might be the only option. Do your homework.

\*Why have panel prices fallen so drastically? One word: CHINA. Our 2010 panels were literally the last of the USA-made Evergreen panels. With the Chinese government subsidizing their factories, the USA producers had the floor pulled out from under them. Anyone willing/able to unplug the AM radio from their cranium easily recognized why the likes of Solyndra and Evergreen failed.

AM radio and Fox News tell us that solar is a scam, solar is impractical, solar can't compete, the "U.S. isn't as sunny as Germany".

The actual "scam" is what shows up every month in your mailbox.  
 Do your own math. Do your own thinking.  
 It's a game-changer...and they know it.



	Typical	Yours
Enter your cumulative lifetime utility cost here.	\$373,355	_____
Enter the PV system material costs here.	\$11,840	_____
Enter your lifetime savings here.	<b>\$361,515</b>	_____

Know of any good retirement funds that can convert 12K into that kind of return?  
 Can you think of better things to spend \$360K on rather than train cars of coal from Wyoming?