

# Home Solar Value in 15 U.S. Cities: Key Assumptions and Data Analysis

How does the market value of solar panel systems change over time? EnergySage and Sandia National Labs conducted an analysis that estimates how much value solar panel systems retain five, ten, and 15 years from purchase. We analyzed values for 15 cities across the United States with the help of the PV Value<sup>®</sup> tool, an online calculator developed by Energy Sense Finance that real estate appraisers and other industry professionals use to develop the market value of solar energy systems.



## Solar PV Value Income Analysis

	New	Income value retained	5 years	10 years	15 years
1. San Francisco, CA	\$5.46	146%	\$4.89	\$4.03	\$3.56
2. Los Angeles, CA	\$5.17	136%	\$4.62	\$3.80	\$3.38
3. Las Vegas, NV	\$4.71	124%	\$4.35	\$3.70	\$3.41
4. New York, NY	\$4.08	108%	\$3.62	\$2.93	\$2.71
5. Newark, NJ	\$3.74	104%	\$3.32	\$2.68	\$2.52
6. Boston, MA	\$3.57	95%	\$3.15	\$2.54	\$2.41
7. Baltimore, MD	\$2.96	89%	\$2.66	\$2.17	\$2.17
8. Washington, D.C.	\$2.87	84%	\$2.64	\$2.20	\$2.24
9. Austin, TX	\$2.58	81%	\$2.24	\$1.74	\$1.80
10. Philadelphia, PA	\$2.80	80%	\$2.40	\$1.85	\$1.86
11. Portland, OR	\$2.23	57%	\$1.98	\$1.58	\$1.72
12. St. Paul, MN	\$2.01	50%	\$1.72	\$1.29	\$1.45
13. Charlotte, NC	\$1.62	44%	\$1.30	\$0.89	\$1.11
14. New Orleans, LA	\$1.35	36%	\$1.03	\$0.64	\$0.91
15. Seattle, WA	\$1.09	26%	\$0.90	\$0.62	\$0.95
	\$/Watt	Percent value retained vs. cost new	\$/Watt	\$/Watt	\$/Watt

## Key Assumptions and Data Analysis continued

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To determine a “retained income value,” we compared gross cost data from the EnergySage Solar Marketplace and the income value when the system is installed new as calculated by PV Value®. The table sorts the cities with the highest retained value. San Francisco ranks the highest, with an income value 46 percent higher than its purchase price. The cities are ranked in decreasing order of retained value when compared to gross cost new. For example, a PV system’s income value in Seattle is 74% less than the gross cost when installed new.

An appraiser would make the ultimate determination of value based on the market conditions, and use other approaches such as cost and sales comparison. However in the case of the top five cities, which have a retained income value above their gross cost, the appraiser will likely develop a value for the system that reflects the cost new, rather than the retained income value.

The PV value income analysis, which is based on future utility rates and escalation assumptions, years suggests that based on future utility rates and escalation assumptions, PV will still have some retained value in five, 10, and 15 years that could be capitalized into the market value of the home. As we don’t know what installed costs will be at that time, the true market value will ultimately be dependent on the real estate appraisers’ assessment of approaches that reflect the local market, including income, cost and/or comparables.

This analysis is meant to provide an idea of how solar PV system market value may change in different metro areas based on assumptions made with today’s information. However, these values should not be used as a true market value for any purpose. Only a licensed and competent real estate appraiser can develop the value of a PV system at the time of the home sale, where multiple factors are considered relating to the condition of the PV system and what the market can bear.

### Key Assumptions

- This analysis assumes the PV system is considered real property, owned by the homeowner and is not by a third party.
- Assumptions are based on an unshaded, properly working system with a fixed latitude tilt, 180° south azimuth angle, degradation rate of 0.5%/year, and derate factor of 0.8.
- Utility rate data were provided by EnergySage.
- O&M expenses estimated at \$0.75/Watt, discounted as explained in the [PV Value®](#) user manual. Future costs may be more or less.
- A risk free rate of 3.38 with 125 basis points (average of 50 to 200 bp spread) was used for a 4.63% discount rate. This is based off the FNM 30-year 60-day rate from October 6, 2015. In the future, the discount rate may be higher or lower, depending on interest rates, which can impact the income value of the PV system.
- The escalation rate is calculated using a compound annual growth rate, based on a 20-year period using statewide [Energy Information Administration \(EIA\)](#) retail electricity rate information. Utility rates are calculated using the escalator to establish an estimate for analysis conducted in October 2015, and 5, 10, and 15 years into the future.
- Inverter replacement may increase the estimated value in year 15 (as calculated in [PV Value®](#)) if the inverter had already been replaced under warranty.
- Uncertainty increases at each 5-year interval as the value is projected into the future.

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