

Economic Framework for Solar Energy Investment

Spending on Electricity

\$125 U.S. household electric expenditures 2002 (\$ Billion)
 \$248 U.S. total electric expenditures 2002 (\$ Billion)

KWH : Kilo Watt Hours

How we measure electric usage
 1,140 107 million U.S. household electric - Billion KWH
 3,867 Total electric generation - Billion KWH
 10,656 KWH per household per year

Electric Service Bill

\$0.06 Average electric generation cost per KWH
 \$0.11 Average household electric bill per KWH
 \$0.11 Average cost per KWH
 \$98 Average monthly bill
 \$1,172 Annual Electric Costs

Electric Generation Costs

KWH	Cost per KWH	per household
4,262	\$0.057	\$244 Peak 40%
6,394	\$0.050	\$322 Off-Peak 60%
10,656	\$0.053	\$566 Average Cost per KWH

Solar Energy System Cost

\$40,000 5 KW 5 Kilowatt system - about half average electric needs
 \$90,000 10 KW 10 Kilowatt system - greater than average electric needs

Solar Energy Production

10.6 Watts per Square Foot of Solar Panel
 515 5 KW System square footage on roof
 950 10 KW System square footage on roof
 5,439 5 KW Average Annual KWH Electric
 10,878 10 KW Average Annual KWH Electric

Financial Analysis for a mid sized 5 KW Solar Energy System in New Jersey

What is the economic benefit of a solar energy investment?

5,732 Solar Electric Generation for NJ
 = \$0.11 x 5,732 Dollar Value of Electric Generation
\$631 Solar Revenue Contribution

Solar electric production will vary by location, tilt, facing direction of roof and other factors

Model Assumptions

3% Energy Cost Increase
 5% Opportunity Cost of Capital
 3% Future Growth in Energy Costs

Years	Now	1	2	3	4	5	6	7+....
Solar Revenues		\$631	\$649	\$669	\$689	\$710	\$731	\$753
Direct Costs	(1,100)	-	-	-	-	-	-	-
Operating Expense	-	-	-	-	-	300	-	-
Fed Tax Benefit	2,000	-	-	-	-	-	-	-
State Rebate Benefit	10,200	-	-	-	-	-	-	-
Cash Flows	11,100	631	649	669	689	410	731	753
Solar Energy Investment	(40,000)							
Net Cash Flows	(28,900)	631	649	669	689	410	731	753
Present Value at 5%	(28,900)	600	451	387	332	165	245	

Sum of Cash Flows (26,720)

Value of Future Cash Flows \$ 37,644

Present Value of Continuing Value \$26,753

Total Value = Sum of Cash Flows + Present Value of Continuing Value
\$33

The value of the solar energy system increases dramatically as the cost of supplying conventional electric rises. As utilities switch to natural gas, with pricing more closely tied to oil prices, the expectation for future electric rate increases is more apparent.

With an annual electric rate increase of 3%, our mid-sized 5 Kilowatt solar system, produces a net negative cash flows of over \$10,000. Not a bad recovery for a system that cost \$40,000 and a \$2,000 federal tax credit. Some states offer incentives including rebates. Any rebate over \$10,168, the solar energy investment produces positive cash flows for your investment.

However, if rising energy prices force higher future utility rate increases, the solar energy system produces positive cash flows from its initial investment outlay.