

Energy Efficiency plus Solar System Proposal

March 21, 2018

Prepared For:

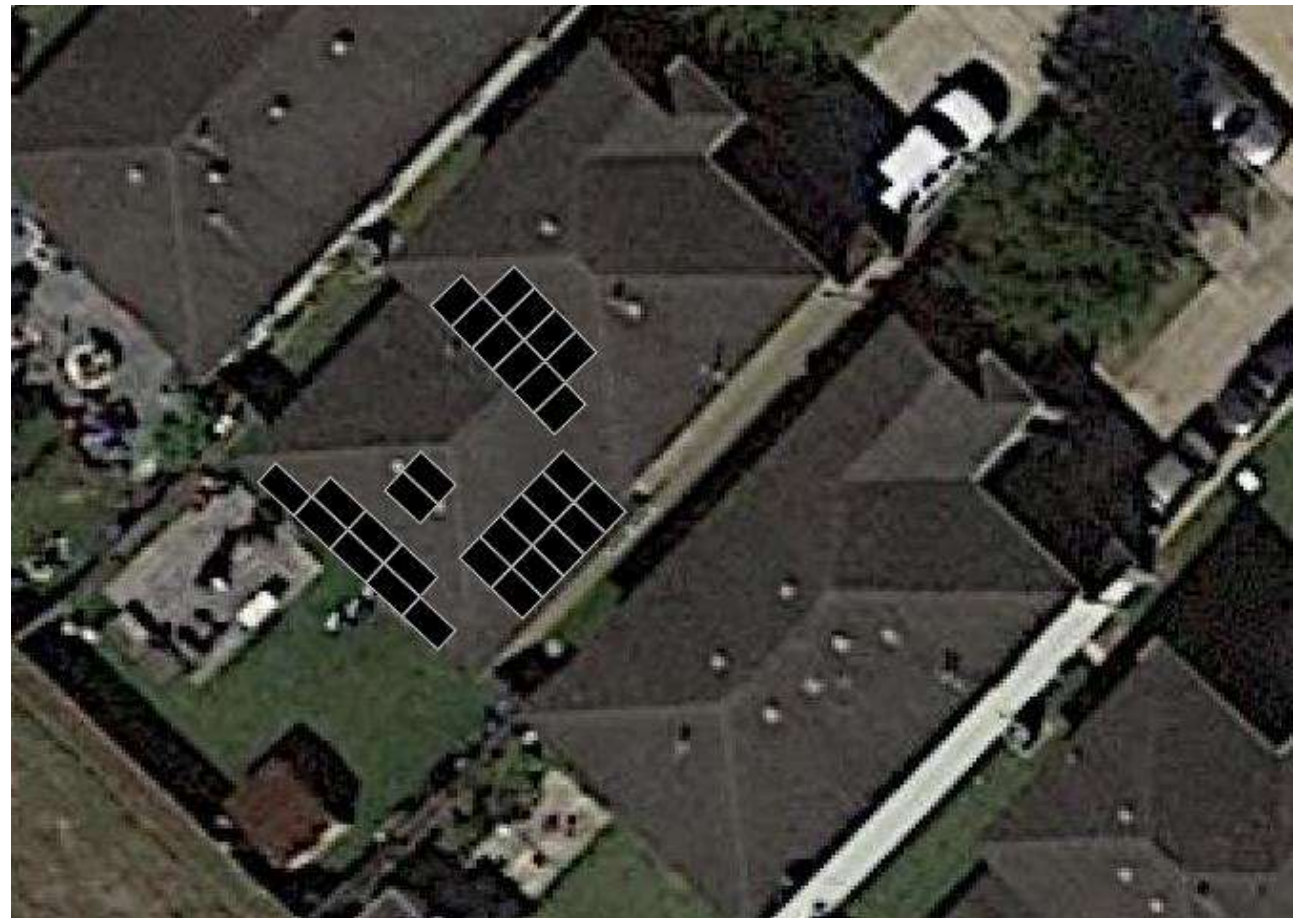
Faith Ettehadieh

Phone: (281) 900-5829

Email: faithse@ymail.com

Project Site:

1214 Curtis Crossing
Missouri City, TX 77489



Introduction

Dear Mr/Mrs Ettehadieh,

Sweetwater Energy Services is honored to submit this proposal for a combination of efficiency measures to reduce your energy needs paired with a solar electric energy system to generate the electricity you use. Our "reduce before you produce" approach provides you with the best return on your investment. The proposed systems will significantly reduce your reliance on electricity from the utility and provide a financially attractive investment that's good to our environment. Instead of buying all your electricity from your utility, you will be generating your own clean energy.

We leveraged the most advanced technology and best practices within the industry to provide the analysis within this proposal.

Sweetwater Energy Services is committed to a quality installation and to ensuring your complete satisfaction. The next step is signing the necessary agreements so we can begin the engineering and permitting processes. This proposal is valid for 30 days.

Why NOW is the best time to go solar!

- Mature Technology
- Exceptional Incentives and Finance Options
- Environmental Benefits
- Simple... We handle all the work.



Licensed Solar Contractor. Design, Sales, Installation, Service.

I'll be your personal representative through the installation process, and your complete satisfaction is my only goal. Please don't hesitate to contact me with any questions you may have about this proposal or the process ahead. Sincerely,

Thomas Rendon

Phone: (361) 349-2274

E-mail: thomas@sweetwaterenergyservices.com

Home Improvement License #: 3568

Efficiency Plus Solar, "Reduce then Produce"

1) Reduce with Energy Efficiency

Selected efficiency measures provide a great return on investment while reducing the amount of solar energy you need to produce, thereby requiring a smaller solar system. Sweetwater Energy Services will implement the following measures to improve the efficiency of your home:

Radiant Barrier

Open Cell Foam

Energy Service	Load Affected	Annual Savings	Savings %
Electric	Total Load	5616.4 kWh	20.0 %

Smart Thermostat

EcoBee

Energy Service	Load Affected	Annual Savings	Savings %
Electric	Total Load	702.1 kWh	2.5 %

Solar Attic Fan

Energy Service	Load Affected	Annual Savings	Savings %
Electric	Total Load	421.3 kWh	1.5 %

The proposed efficiency measures will *save about 24.0 % of your current annual electricity purchases*, and about *N/A of your current non-electric energy purchases*.

2) Produce with Solar Electric System

Sweetwater Energy Services will install a complete, turn-key solar electric system at your site. All engineering, materials, and installation labor are included. Sweetwater Energy Services will coordinate and procure all necessary building permits, and administer the system's interconnection to the utility grid.

Primary System Components

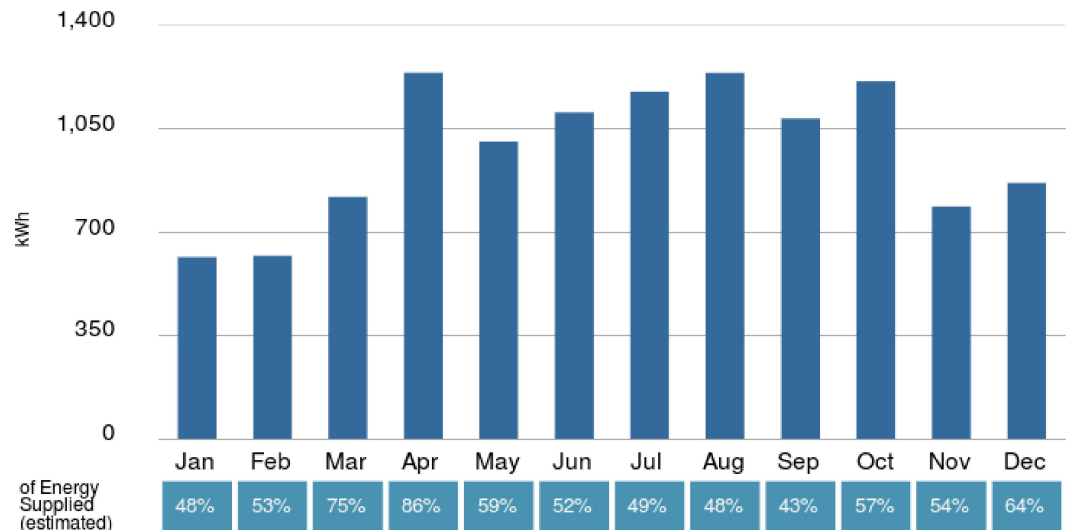
- 30 Jinko Solar JKM300M-60-V PV Module
- 1 SolarEdge Technologies SE7600A-US (240V) Inverter
- 30 SolarEdge Technologies OP300-MV-Z DC Optimizer

Rated Size of Proposed System

Nameplate: 9.000 DC kW (STC)
AC Rating: 8.094 AC kW (CEC)

Est. System Output (First Year): 11,832 kWh

Solar Electricity Generated (estimated)



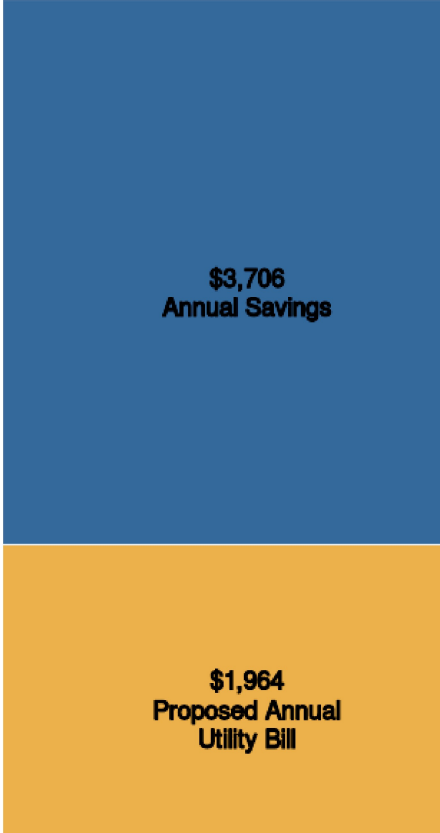
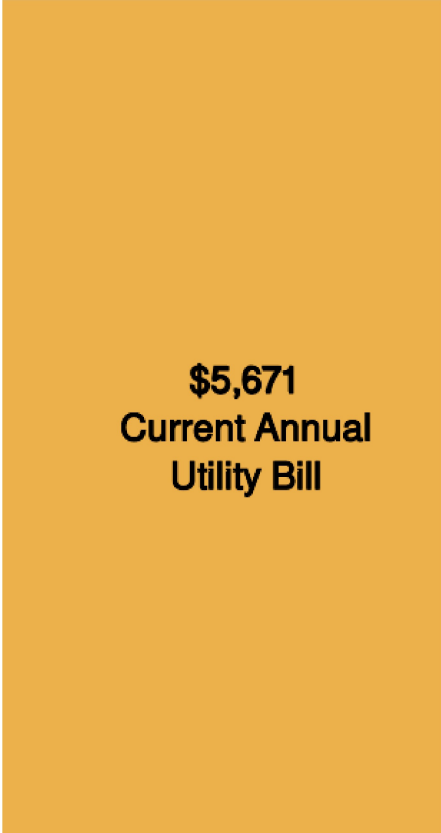
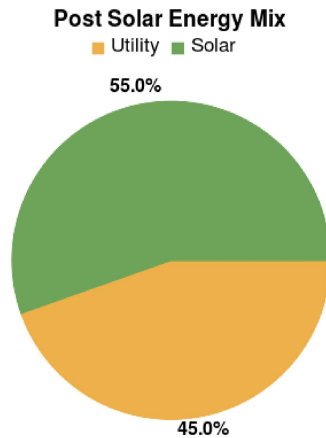
Annual Energy Bill Savings

The proposed energy efficiency measures reduce the energy you purchase from the utility. Your solar electric system will provide you with energy that you would have otherwise purchased from the utility. The avoided cost of electricity is the primary financial benefit of the proposed measures. We use the most advanced software available to model the proposed PV system's output and the expected electric bills after the efficiency measures and solar system is installed.

The graph at right compares your current annual energy costs with the estimated annual energy costs following implementation of the proposed project.

Electric: You will go from purchasing 28,068 kWh a year from CenterPoint Energy Houston Electric, LLC to only purchasing about 9,500 kWh

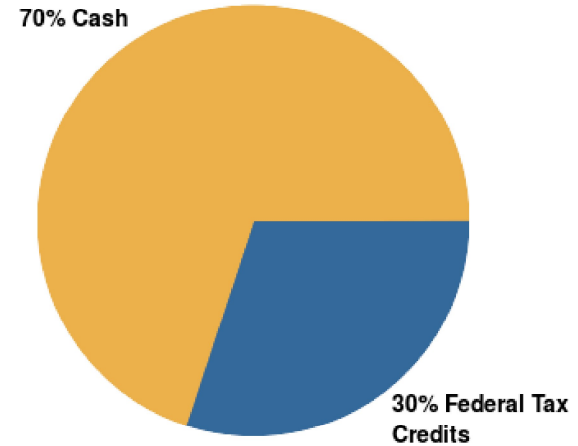
Non-Electric: You will go from purchasing - a year from - to only purchasing about 0



Project Costs

Sub-Total:	\$28,350.00
Discount:	-\$524.00
Incentives Collected by Contractor:	-\$0.00
Sales Tax:	\$0.00
Permit Fees:	\$0.00
<hr/>	
Contract Price:	\$27,826.00
Incentives Collected by Customer in First Year*:	-\$8,347.80
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Net Customer Price:	\$19,478.20

Year One Project Funding



Finance Option: Pay Cash
 Down Payment: -
 Monthly Payment: -

Finance Period: -
 Interest Rate: -

The "Contract Price" is the amount due and payable by you, the customer. If available, Sweetwater Energy Services will file for and collect incentives that reduce the contract price. Note that incentive amount(s) shown, if any, are based on currently known availability. Actual amounts could be more or less, based on availability at time of application submittals. Please note this is a preliminary estimate and may be altered due to changes in system design or financial assumptions.

* - May include tax credits, rebates, and performance based incentives, less applicable tax liabilities.

Future Savings - A Compelling Investment

Efficient energy systems are a safe, and highly effective investment. To quantify the value, we conducted an analysis of the life-cycle costs and benefits associated with the proposed project.

The graph at right compares your future annual energy costs with and without the proposed efficiency measures and solar system. Most of your savings result from savings on electricity bills. The savings grow year over year as you avoid utility purchases that increase in cost every year at the assumed rate of 3.4 %, while your solar energy never rises in price.

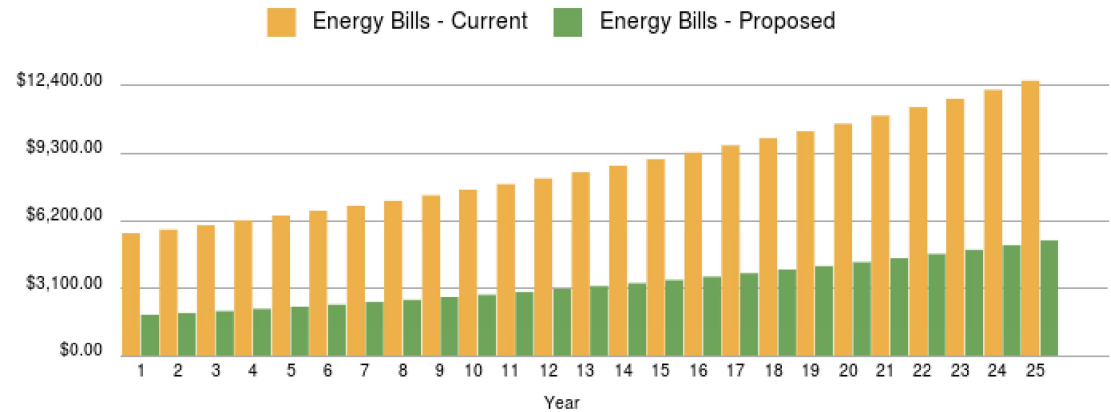
Levelized Cost of Energy

If you sum all costs associated with energy purchases over the PV system's lifetime, and divide by the amount of energy you consume, you get the average, or "levelized" cost per unit of energy used.

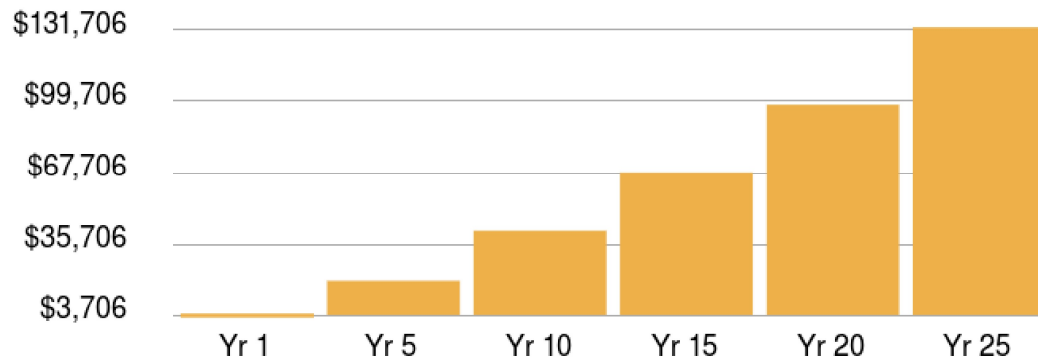
Cost from utility: \$0.29 / kWh

Cost of efficiency measures + solar + utility: \$0.16 / kWh

Annual Energy Cost Comparison



Cumulative Utility Bill Savings



As the graph at left shows, the cumulative savings can be significant over the system's 25 yrs lifetime.

These savings drive significant financial returns on your investment:

Internal Rate of Return (IRR): 20.20 %

Net Present Value: \$53,585.02

Payback (cumulative cashflow): 5.0 yrs

NOTE: IRR and payback are not applicable if no upfront investment is made.

Environmental Benefits

Efficiency measures paired with solar electric systems provide significant environmental benefits over their lifetimes. Depending on location and system specifics, the energy produced by a solar electric system during its first 0.5 - 1.5 years will fully offset the energy used to produce and install that system. The energy produced by the system over its remaining 30 year lifespan will offset the negative effects of fossil fuel energy. The examples below illustrate some comparisons:



The proposed project will eliminate as much greenhouse gas emissions as not burning 8,768 coal lbs / yr.



The proposed project will eliminate as much atmospheric carbon as is sequestered by 6.69 forested acres / yr.



The proposed project will eliminate as much greenhouse gas emissions as not driving 19,428 vehicle miles / yr.

Sources:

- <http://cleantechnica.com/2013/12/26/solar-energy-payback-time-charts/>
- <http://www.epa.gov/cleanenergy/energy-resources/calculator.html#results>

Cashflow Details

Cash Flow Summary	Estimated Utility Bill w/o Project	Estimated Utility Bill with Project	Customer Payments ¹	Estimated O&M Expenses	Incentives (Received after Purchase) ²	Estimated Net Savings	Estimated Cumulative Savings
Upfront			(\$27,826)			(\$27,826)	(\$27,826)
Year 1	(\$5,671)	(\$1,964)		(\$14)	\$8,348	\$12,040	(\$15,786)
Year 2	(\$5,863)	(\$2,050)		(\$14)		\$3,799	(\$11,987)
Year 3	(\$6,063)	(\$2,140)		(\$15)		\$3,908	(\$8,079)
Year 4	(\$6,269)	(\$2,233)		(\$15)		\$4,021	(\$4,059)
Year 5	(\$6,482)	(\$2,330)		(\$16)		\$4,137	\$78
Year 6	(\$6,702)	(\$2,430)		(\$16)		\$4,256	\$4,334
Year 7	(\$6,930)	(\$2,535)		(\$17)		\$4,378	\$8,712
Year 8	(\$7,166)	(\$2,644)		(\$17)		\$4,505	\$13,217
Year 9	(\$7,409)	(\$2,757)		(\$18)		\$4,634	\$17,851
Year 10	(\$7,661)	(\$2,875)		(\$18)		\$4,768	\$22,619
Year 11	(\$7,922)	(\$2,998)		(\$19)		\$4,905	\$27,525
Year 12	(\$8,191)	(\$3,125)		(\$19)		\$5,047	\$32,571
Year 13	(\$8,470)	(\$3,258)		(\$20)		\$5,192	\$37,764
Year 14	(\$8,758)	(\$3,395)		(\$20)		\$5,342	\$43,105
Year 15	(\$9,055)	(\$3,539)		(\$21)		\$5,496	\$48,601
Year 16	(\$9,363)	(\$3,688)		(\$22)		\$5,654	\$54,255
Year 17	(\$9,682)	(\$3,842)		(\$22)		\$5,817	\$60,072
Year 18	(\$10,011)	(\$4,003)		(\$23)		\$5,985	\$66,057
Year 19	(\$10,351)	(\$4,170)		(\$24)		\$6,157	\$72,214
Year 20	(\$10,703)	(\$4,344)		(\$24)		\$6,335	\$78,549
Year 21	(\$11,067)	(\$4,525)		(\$25)		\$6,517	\$85,066
Year 22	(\$11,443)	(\$4,713)		(\$26)		\$6,705	\$91,771
Year 23	(\$11,832)	(\$4,908)		(\$27)		\$6,898	\$98,669
Year 24	(\$12,235)	(\$5,110)		(\$27)		\$7,097	\$105,766
Year 25	(\$12,651)	(\$5,321)		(\$28)		\$7,301	\$113,068

¹ Includes upfront purchase payments to seller less applicable rebates, and ongoing finance payments, if applicable.

² May include state and/or federal tax credits, performance based incentives, and/or renewable energy credits (RECs)

Assumptions and Definitions

<p>Analysis Period / System Lifetime: 25 yrs</p> <p>Electric Utility: CenterPoint Energy Houston Electric, LLC</p> <p>Current Electric Rate Schedule: Residential (R)</p> <p>Proposed Electric Rate Schedule: Residential (R)</p> <p>Annual Electricity Inflation Rate: 3.4 %</p> <p>Utility rate savings: Post-tax dollars (because utility bills are paid with post-tax dollars)</p> <p>Discount Rate (for IRR and NPV): 5.0 %</p>	<p>Finance Instrument: Pay Cash</p> <p>Finance Rate (if applicable): -</p> <p>Finance Period (if applicable): -</p> <p>Annual Rate Escalator (if Lease or PPA): -</p> <p>Fed income tax applied to rebates? (if applicable): YES. Therefore, the basis for the Federal ITC is the full installation cost</p> <p>Federal Depreciation Method (if comm.): N/A</p> <p>State Depreciation Method (if comm.): N/A</p>
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Electric Utility Bill Estimate													
(kWh)	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual[†]
Electric Use Without Solar	1,689	1,548	1,450	1,903	2,235	2,803	3,164	3,409	3,341	2,799	1,937	1,790	28,068
Solar and Efficiency	1,026	997	1,174	1,701	1,546	1,784	1,939	2,062	1,892	1,887	1,259	1,302	18,568
Electric Use With Solar	663	551	276	202	689	1,019	1,225	1,347	1,449	912	678	488	9,500
(Cost)	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual[†]
Utility Bill without Solar*	\$348	\$319	\$291	\$381	\$446	\$558	\$629	\$677	\$683	\$573	\$398	\$368	\$5,671
Utility Bill with Solar*	\$140	\$117	\$60	\$45	\$141	\$206	\$247	\$271	\$299	\$190	\$143	\$104	\$1,964
Annual Credits	For excess generation, net metering and net surplus compensation (month of credit depends on interconnection date)												\$0
Utility Bill Savings	\$208	\$202	\$231	\$336	\$305	\$352	\$382	\$406	\$384	\$383	\$255	\$264	\$3,707

The table at left compares your current electric use and bills to your estimated utility bills with the proposed PV system. Monthly bills vary over the course of the year with your energy use and available sunlight.

* includes utility rate increase of 3.4 % † annual totals may not equal sum of monthly values due to rounding

NOTE: At times when your PV system produces more electricity than you use, the dollar value of the excess energy is credited to your account and settled

annually with the utility.

Payback period refers to the period of time required for the benefits of an investment to "repay" the sum of the original investment. If no upfront investment is made, there is nothing to payback, and thus irrelevant. Payback period is often used as an analysis metric because it is easy to apply and easy to understand, but it does not consider the value of benefits beyond the initial payback period. A PV system is a long term investment where value increases more and more each subsequent year as utility energy prices increase.

The **Internal Rate of Return (IRR)** of an investment is the interest rate at which the net present value of the total project's costs equals the net present value of the project's benefits. IRR is used to compare the profitability of multiple possible investments (or projects) of the same cost and duration. Think about investing an equivalent sum of money into another investment (for example, stocks or bonds) and comparing its anticipated annual return over the entire period. An important aspect of comparing the IRRs is to ensure that the cost of risks are properly evaluated in discounting future values. Avoiding energy costs with a PV System is a very secure investment. Because the internal rate of return is a rate quantity, it is an indicator of the efficiency, quality, or yield of an investment.

Increase in Property Value refers to the amount you can expect to recoup from the investment if you were to sell your property. This is important to know in cases where you plan to sell the property before owning it long enough to realize the payback (or full rate of return given an entire system lifetime). Studies show that home buyers are willing to pay more for homes with solar and energy efficiency features. The most recent study, and the one used to calculate the increase in property in this proposal, describes the increase in value as a function of a PV system's rated size in watts. This study and methodology can be found here: [An Analysis of the Effects of Residential Photovoltaic Energy Systems on Home Sales Prices in California](#), Lawrence Berkeley National Laboratory, April 2011.

Net Present Value (NPV) indicates how much value a project adds to the individual or firm. It is a standard method for using the time value of money to appraise long-term projects. In order to compare future monetary value to the present value, it is discounted by a certain rate. The rate used to discount future cash flows to the present value is a key variable of this process.

Tiered & Time of Use (TOU) electricity rate schedules - Many electricity rate schedules are billed using a progressive tiered rate structure. Each tier is a quantity of electricity. Solar electric systems are especially valuable in tiered rate structures because they eliminate the most expensive electricity from your monthly bill. Your solar electric system provides energy that you would have purchased from the utility. For customers who will be switching to a time-of-use rate structure, efforts to reduce peak usage can be especially cost effective.