



Subject: **Initial Solar Feasibility Study
Santa Cruz County Libraries**

Prepared for: **Santa Cruz County Libraries Reviewed**

1. Aptos Library, 7695 Soquel Drive, Aptos
2. Boulder Creek Library, 13390 West Park Ave., Boulder Creek
3. Branciforte Library, 230 Gault Street, Santa Cruz
4. Capitola Library, 2005 Wharf Road, Capitola
5. Downtown Santa Cruz Library, 224 Church Street, Santa Cruz
6. Felton Library, 6299 Gushee Street, Felton
7. Garfield Library, 705 Woodrow Avenue, Santa Cruz
8. La Selva Beach Library, 316 Estrella Avenue, La Selva Beach
9. Live Oak Library, 2380 Portola Drive, Santa Cruz
10. Scotts Valley Library, 251 Kings Village Road, Scotts Valley

Prepared by: **Allterra Solar**
207-B McPherson Street
Santa Cruz, CA 95060

831.425.2608
www.allterasolar.com



November 30, 2017

Ms. Kira Henefin
Santa Cruz Public Libraries
Santa Cruz, CA

Subject: Results of Initial Solar Photovoltaic (PV) Feasibility Study for Santa Cruz County Public Library Buildings

Dear Ms. Henefin,

Allterra Solar (Allterra) is submitting this summary report of the results of our solar feasibility study completed for ten public library sites in Santa Cruz County (County). This feasibility study was developed using industry standards for design, cost, and financial analyses, along with information and utility data provided by the County.

Evaluation Summary

Allterra completed an initial solar feasibility study and financial analysis for the ten sites. Allterra’s evaluation included the following:

Sites Evaluated:

Our feasibility study included the following sites:

1. Aptos Library, 7695 Soquel Drive, Aptos
2. Boulder Creek Library, 13390 West Park Ave., Boulder Creek
3. Branciforte Library, 230 Gault Street, Santa Cruz
4. Capitola Library, 2005 Wharf Road, Capitola
5. Downtown Santa Cruz Library, 224 Church Street, Santa Cruz
6. Felton Library, 6299 Gushee Street, Felton
7. Garfield Library, 705 Woodrow Avenue, Santa Cruz
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9. Live Oak Library, 2380 Portola Drive, Santa Cruz
10. Scotts Valley Library, 251 Kings Village Road, Scotts Valley

Evaluation Scope:

Solar array locations were selected and system designs were completed in order to determine system size and power production. Designs were based on remote site surveys completed using Google Maps.

Utility Rate Evaluations: PG&E account data was evaluated for solar potential. Please note that limited PG&E data was provided (PG&E rate details and annual consumption), therefore our energy and financial analyses results are estimated.

Financial Analysis: The financial analysis variables used to determine Net Present Value (NPV) included:

- Discount Rate = 6%
- General Inflation Rate = 3%
- Electricity Inflation Rate = 3%
- Evaluation Timeframe = 25 years
- No tax incentives were applied

General Assumptions: This is an initial evaluation for a cash purchase of a solar PV system. Finance options are available upon request.

Solar Module Type: Manufacturer | LG Electronics
Model | LG350Q1C-A5 or LG335N1C-A5 (based on site)

Inverter Type: Manufacturers | SolarEdge or Enphase Energy (based on site)

Installation Warranty: Standard 10-year workmanship warranty in accordance with the CSLB.

Web Monitoring: Inverter web-based monitoring is provided with the solar PV systems. Internet service must be available at the building in order for the web monitoring to operate. Another option is cellular based monitoring plans.

Roofing Allowances: This evaluation did not include roof integrity studies. Roof quality evaluations should be completed prior to project commencement.

Pricing Consideration: The sites have not been inspected first hand and the pricing is estimated. We included “prevailing wage” for the pricing.

FEASIBILITY STUDY RESULTS

Allterra has completed initial designs and energy analyses for each site. Overall, solar has the potential to significantly reduce the amount PG&E electricity the libraries consume, while reducing carbon emission by approximately 380 tons per year. From an electricity cost savings standpoint, solar could reduce the libraries overall costs by approximately \$144,000 year 1 and over \$6 million over the next 25 years.

Detailed evaluations for each of the ten sites is presented in the attachments. Also, a summary data table shows all the key data for each site.

CONCLUSIONS AND RECOMMENDATIONS

The following is a summary of our conclusions and recommendations based on the results of the Feasibility Study.

- An important note is that we had limited PG&E data when running our feasibility study. For the next phase, we recommend that detailed rate information and interval data (.xml files) be used when finalizing system sizing and return on investment analyses.
- There is the potential to install up to 482 KW of solar on all the library roofs combined. Three of the projects are considered small (5.4 KW to 11.2 KW), six projects are medium (21.1 KW to 64.7 KW), and one is large (Downtown Santa Cruz Library at 230 KW).
- Solar can offset the majority of the electricity consumption for all the buildings, with six projects at 90%-100% energy offset.
- The levelized cost of solar electricity ranges from \$0.13/kwh to \$0.17/kwh which is much less than what the libraries are purchasing PG&E electricity at currently, over \$0.21/kwh.
- With solar, the public libraries can reduce electricity costs by almost \$6.5 million and reduce CO2 emissions by more than 765,000 pounds per year (380 tons/year).
- We recommend evaluating different financing mechanisms, such as a Prepaid Power Purchase Agreements (PPA), for these projects to compare to a straight "cash" purchase. A strategy might be to pay cash for the smaller projects and finance the larger ones.

In the attachments, you will find a Summary Table and individual models for each site. Once you have had a chance to review everything please let me know what questions you have so that I can address them. We appreciate the opportunity to work with you. I can be reached at (831) 425-2608 or james@allterasolar.com.

Sincerely,
Allterra Solar



James Allen
CEO

Enclosures

Table 1: Summary Table
Individual Models and Analyses for Each Site

Table 1 - Summary Table for Solar Feasibility Study
Santa Cruz County Libraries

County of Santa Cruz Libraries	System Size (KW)	Power Output (kwh/Year 1)	Energy Offset (%)	Year 1 Savings (\$)	Estimated 25-Yr Savings (\$)	Investment (\$)	Levelized \$/kwh	C02 Reductions (lbs/year 1)
1. Aptos Library	36.2	53,479	98%	\$ 8,484	\$ 309,327	\$ 143,126	\$ 0.13	59,148
2. Boulder Creek Library	21.8	29,902	64%	\$ 4,988	\$ 181,876	\$ 93,632	\$ 0.16	33,072
3. Branciforte Library	36.1	51,426	100%	\$ 8,473	\$ 407,488	\$ 142,182	\$ 0.15	56,877
4. Capitola Library	21.1	28,454	71%	\$ 4,638	\$ 169,090	\$ 89,693	\$ 0.16	31,470
5. Downtown Santa Cruz Library	230.7	324,045	67%	\$ 71,169	\$ 3,433,457	\$ 738,176	\$ 0.12	358,394
6. Felton Library	5.4	7,482	99%	\$ 1,668	\$ 85,329	\$ 25,065	\$ 0.17	8,275
7. Garfield Library	11.2	15,083	94%	\$ 3,391	\$ 173,468	\$ 50,000	\$ 0.17	16,682
8. La Selva Beach Library	7.0	10,575	91%	\$ 2,384	\$ 83,518	\$ 30,830	\$ 0.15	11,696
9. Live Oak Library	48.6	70,626	58%	\$ 16,822	\$ 839,994	\$ 189,750	\$ 0.14	78,112
10. Scotts Valley Library	64.7	100,690	98%	\$ 22,175	\$ 766,165	\$ 251,900	\$ 0.13	111,363
Totals	482.6	691,762	--	\$ 144,192	\$ 6,449,712	\$1,754,354	--	765,089

System Details

Solar PV System | Your Custom Design

Our team prepared a solar design for your business. Design specifications are shown below. All systems include monitoring.

System Size:	36.180 DC kW (STC)
Number of Panels:	108
Solar Panel Type:	LG Electronics LG335N1C-A5
Inverter Type:	2 SolarEdge Technologies SE14.4KUS

Solar Power Production | How much electricity will my system generate?

Solar will generate electricity and PG&E will credit your account based on how many kilowatt-hours (kwh) the system produces. Solar power production estimates are shown below.

Year 1 Production: **53,479 kWh** PG&E Usage Offset: **98 %**

Solar Electricity Generated (estimated)



PG&E Bill Offset | What will my PG&E bill be after the solar is up and running?

Solar will provide most of the power for your facility and reduce your PG&E bill. Our estimates are shown below.

Last Year's PG&E Bill	Next Year's PG&E Bill
\$11,769	\$3,285

PG&E Bill Offset:	72 %
Year 1 Savings:	\$8,484
25-Year Savings:	\$309,327

Your Current Cost Per kWh: **\$0.21 / kWh**



Return On Investment

Solar Proposal | How much does the system cost?

Allterra always keeps an eye out for new technology so you can be sure you are getting the best equipment at a competitive price. The system cost includes all permitting, solar equipment, warranties, monitoring, and labor for design and installation. Allterra installs a turnkey solar PV system and provides all the logistical support needed to get your solar power plant up and running.

Total Amount	\$143,126.00	<hr/> Average Price for Solar Electricity \$0.13 / kWh <hr/>
Less Federal Tax Credit:	(\$0.00)	
Less MACRs Depreciation (year 1):	(\$0.00)	
Net Project Price (year 1)	\$143,126.00	

Return On Investment | There are lots of reasons to go solar.



Your Financial Benefits

Internal Rate of Return (IRR):	6.11 %
Payback Period (Years):	13.9 yrs
25-yr Project Savings:	\$166,201
Net Present Value (NPV):	\$95,913.50



You will offset these harmful greenhouse gases

CO ₂ Reductions	59147.77 lbs/yr
NO _x Reductions	20.27 lbs/yr
SO ₂ Reductions	9.68 lbs/yr

Commercial Cash Flow Table – Cash Purchase

This table of estimated cash flows includes any tax effects, rate and cost inflation and other time-related cash-flow factors as detailed in Assumptions and Definitions.

Cash Flow Summary	Estimated Utility Bill w/o Project	Estimated Utility Bill with Project	Customer Payments ¹	Estimated Net Savings	Estimated Cumulative Savings
Upfront			(\$143,126)	(\$143,126)	(\$143,126)
Year 1	(\$11,769)	(\$3,285)		\$8,484	(\$134,642)
Year 2	(\$12,122)	(\$3,383)		\$8,739	(\$125,903)
Year 3	(\$12,486)	(\$3,485)		\$9,001	(\$116,902)
Year 4	(\$12,860)	(\$3,589)		\$9,271	(\$107,631)
Year 5	(\$13,246)	(\$3,697)		\$9,549	(\$98,082)
Year 6	(\$13,644)	(\$3,808)		\$9,836	(\$88,246)
Year 7	(\$14,053)	(\$3,922)		\$10,131	(\$78,116)
Year 8	(\$14,474)	(\$4,040)		\$10,435	(\$67,681)
Year 9	(\$14,909)	(\$4,161)		\$10,748	(\$56,934)
Year 10	(\$15,356)	(\$4,286)		\$11,070	(\$45,864)
Year 11	(\$15,817)	(\$4,415)		\$11,402	(\$34,462)
Year 12	(\$16,291)	(\$4,547)		\$11,744	(\$22,718)
Year 13	(\$16,780)	(\$4,683)		\$12,096	(\$10,621)
Year 14	(\$17,283)	(\$4,824)		\$12,459	\$1,838
Year 15	(\$17,802)	(\$4,969)		\$12,833	\$14,671
Year 16	(\$18,336)	(\$5,118)		\$13,218	\$27,889
Year 17	(\$18,886)	(\$5,271)		\$13,615	\$41,504
Year 18	(\$19,452)	(\$5,429)		\$14,023	\$55,527
Year 19	(\$20,036)	(\$5,592)		\$14,444	\$69,971
Year 20	(\$20,637)	(\$5,760)		\$14,877	\$84,848
Year 21	(\$21,256)	(\$5,933)		\$15,323	\$100,171
Year 22	(\$21,894)	(\$6,111)		\$15,783	\$115,954
Year 23	(\$22,551)	(\$6,294)		\$16,257	\$132,211
Year 24	(\$23,227)	(\$6,483)		\$16,744	\$148,955
Year 25	(\$23,924)	(\$6,677)		\$17,247	\$166,201

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

Annual Electricity Inflation Rate: 3.0 %

Discount Rate: 2.0 %

Annual Electricity Inflation Rate is the assumed rate (%) of electricity cost inflation per year and is based on the historical averages for PG&E.

The Discount Rate lowers the value of future cashflows.

Home Value Increase refers to the amount you can expect to recoup from the investment if you were able to sell your property and is based on the following study: An Analysis of the Effects of Residential Photovoltaic Energy Systems on Home Sales Prices in California, Lawrence Berkeley National Laboratory, April 2011.

The Internal Rate of Return of an investment is the interest rate at which the net present value of the project's cost equals the net present value of the project's benefits.

Payback Period refers to the period of time required for the benefits of an investment to "repay" the sum of the original investment.

Preliminary PV Array Layout



Sales Consultant



James Allen

Phone: (831) 334-0696

Email: james@allterraenv.com

Proposal Date: November 28, 2017|Santa Cruz City - Aptos Library

Project|SN#8397, Solution A

This proposal is valid for 30 days from the proposal date.

Preliminary System Bill of Materials

Manufacturer	Product	Description	Qty	Unit
SolarEdge Technologies	SE14.4KUS	Three-phase 208V string inverter	2.00	each
SolarEdge Technologies	P700	Module Add-On for 2 x 72 cell modules and three phase SE inverters. For Commercial Installations for North America.	54.00	each
LG Electronics	LG335N1C-A5	335W 60 cell Monocrystalline module with Cello technology	108.00	each
Allterra Solar	Labor & BOS	All labor & balance of materials	1	-



Allterra Solar | 207-B McPherson Street | Santa Cruz, CA 95060
 Phone: (831) 425-2608 | Fax: (831) 425-2609 | www.allterasolar.com

System Details

Solar PV System | Your Custom Design

Our team prepared a solar design for your business. Design specifications are shown below. All systems include monitoring.

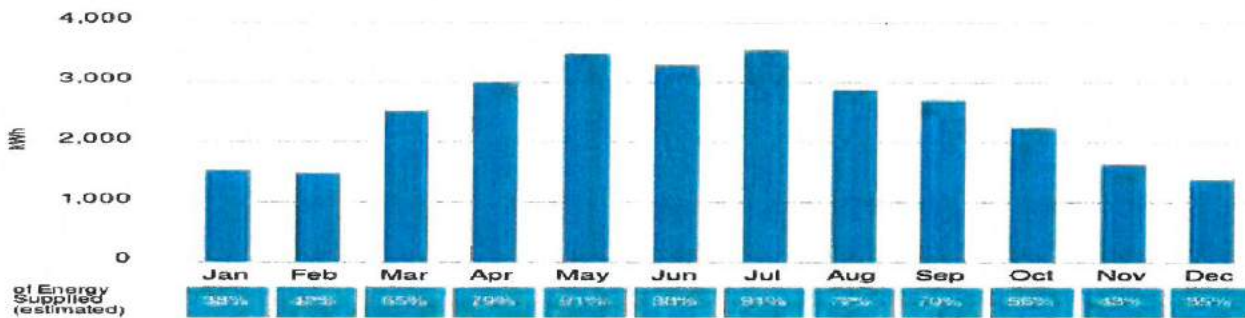
System Size:	21.775 DC kW (STC)
Number of Panels:	65
Solar Panel Type:	LG Electronics LG335N1C-A5
Inverter Type:	1 SMA America STP24000TL-US-10 (480V)

Solar Power Production | How much electricity will my system generate?

Solar will generate electricity and PG&E will credit your account based on how many kilowatt-hours (kWh) the system produces. Solar power production estimates are shown below.

Year 1 Production: **29,902 kWh** PG&E Usage Offset: **64 %**

Solar Electricity Generated (estimated)



PG&E Bill Offset | What will my PG&E bill be after the solar is up and running?

Solar will provide most of the power for your facility and reduce your PG&E bill. Our estimates are shown below.

Last Year's PG&E Bill	Next Year's PG&E Bill
\$10,259	\$5,271

PG&E Bill Offset:	49 %
Year 1 Savings:	\$4,988
25-Year Savings:	\$181,876

Your Current Cost Per kWh: **\$0.22 / kWh**



Return On Investment

Solar Proposal | How much does the system cost?

Allterra always keeps an eye out for new technology so you can be sure you are getting the best equipment at a competitive price. The system cost includes all permitting, solar equipment, warranties, monitoring, and labor for design and installation. Allterra installs a turnkey solar PV system and provides all the logistical support needed to get your solar power plant up and running.

Total Amount	\$93,632.00	<hr/> Average Price for Solar Electricity \$0.16 / kWh <hr/>
Less Federal Tax Credit:	(\$0.00)	
Less MACRS Depreciation (year 1):	(\$0.00)	
Net Project Price (year 1)	\$93,632.00	

Return On Investment | There are lots of reasons to go solar.

Financial ROI

Your Financial Benefits

Internal Rate of Return (IRR):	5.15 %
Payback Period (Years):	15.1 yrs
25-yr Project Savings:	\$88,244
Net Present Value (NPV):	\$46,916.96

Environmental ROI

You will offset these harmful greenhouse gases

CO ₂ Reductions	33071.61 lbs/yr
NO _x Reductions	11.33 lbs/yr
SO ₂ Reductions	5.41 lbs/yr

Commercial Cash Flow Table – Cash Purchase

This table of estimated cash flows includes any tax effects, rate and cost inflation and other time-related cash-flow factors as detailed in Assumptions and Definitions.

Cash Flow Summary	Estimated Utility Bill w/o Project	Estimated Utility Bill with Project	Customer Payments ¹	Estimated Net Savings	Estimated Cumulative Savings
Upfront			(\$93,632)	(\$93,632)	(\$93,632)
Year 1	(\$10,259)	(\$5,271)		\$4,989	(\$88,644)
Year 2	(\$10,567)	(\$5,429)		\$5,138	(\$83,505)
Year 3	(\$10,884)	(\$5,592)		\$5,292	(\$78,213)
Year 4	(\$11,210)	(\$5,759)		\$5,451	(\$72,762)
Year 5	(\$11,547)	(\$5,932)		\$5,615	(\$67,147)
Year 6	(\$11,893)	(\$6,110)		\$5,783	(\$61,364)
Year 7	(\$12,250)	(\$6,293)		\$5,957	(\$55,408)
Year 8	(\$12,617)	(\$6,482)		\$6,135	(\$49,273)
Year 9	(\$12,996)	(\$6,677)		\$6,319	(\$42,953)
Year 10	(\$13,386)	(\$6,877)		\$6,509	(\$36,444)
Year 11	(\$13,787)	(\$7,083)		\$6,704	(\$29,740)
Year 12	(\$14,201)	(\$7,296)		\$6,905	(\$22,835)
Year 13	(\$14,627)	(\$7,515)		\$7,112	(\$15,723)
Year 14	(\$15,066)	(\$7,740)		\$7,326	(\$8,397)
Year 15	(\$15,518)	(\$7,972)		\$7,546	(\$851)
Year 16	(\$15,983)	(\$8,211)		\$7,772	\$6,920
Year 17	(\$16,463)	(\$8,458)		\$8,005	\$14,925
Year 18	(\$16,957)	(\$8,712)		\$8,245	\$23,171
Year 19	(\$17,465)	(\$8,973)		\$8,493	\$31,663
Year 20	(\$17,989)	(\$9,242)		\$8,747	\$40,411
Year 21	(\$18,529)	(\$9,519)		\$9,010	\$49,420
Year 22	(\$19,085)	(\$9,805)		\$9,280	\$58,700
Year 23	(\$19,658)	(\$10,099)		\$9,559	\$68,259
Year 24	(\$20,247)	(\$10,402)		\$9,845	\$78,104
Year 25	(\$20,855)	(\$10,714)		\$10,141	\$88,244

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

Annual Electricity Inflation Rate: 3.0 %

Discount Rate: 2.0 %

Annual Electricity Inflation Rate is the assumed rate (%) of electricity cost inflation per year and is based on the historical averages for PG&E

The Discount Rate lowers the value of future cashflows.

Home Value Increase refers to the amount you can expect to recoup from the investment if you were able to sell your property and is based on the following study: An Analysis of the Effects of Residential Photovoltaic Energy Systems on Home Sales Prices in California, Lawrence Berkeley National Laboratory, April 2011.

The Internal Rate of Return of an investment is the interest rate at which the net present value of the project's cost equals the net present value of the project's benefits. Payback Period refers to the period of time required for the benefits of an investment to "repay" the sum of the original investment.

Preliminary PV Array Layout



Sales Consultant



James Allen

Phone: (831) 334-0696

Email: james@allterraenv.com

Proposal Date: November 28, 2017|Santa Cruz City - Boulder Creek Library Project|SN#8398, Solution A

This proposal is valid for 30 days from the proposal date.

Preliminary System Bill of Materials

Manufacturer	Product	Description	Qty	Unit
LG Electronics	LG335N1C-A5	335W 60 cell Monocrystalline module with Cello technology	65.00	each
SMA America	STP24000TL-US-10 (480V)	24kW, 480Vac 3-phase, Sunny Tripower Transformerless Utility-Interactive Inverter	1.00	each
Allterra Solar	Labor & BOS	All labor & balance of materials	1	-



System Details

Solar PV System | Your Custom Design

Our team prepared a solar design for your business. Design specifications are shown below. All systems include monitoring.

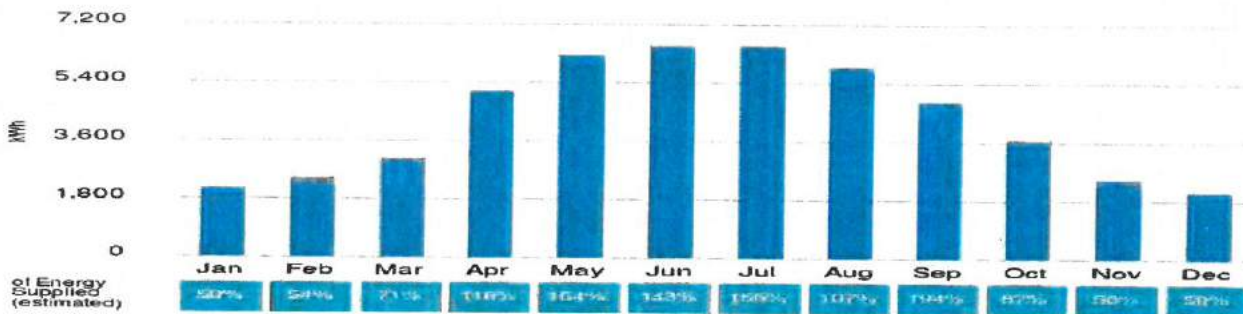
System Size:	36.050 DC kW (STC)
Number of Panels:	103
Solar Panel Type:	LG Electronics LG350Q1C-A5
Inverter Type:	4 SolarEdge Technologies SE14.4KUS

Solar Power Production | How much electricity will my system generate?

Solar will generate electricity and PG&E will credit your account based on how many kilowatt-hours (kwh) the system produces. Solar power production estimates are shown below.

Year 1 Production: **51,426 kWh** PG&E Usage Offset: **100 %**

Solar Electricity Generated (estimated)



PG&E Bill Offset | What will my PG&E bill be after the solar is up and running?

Solar will provide most of the power for your facility and reduce your PG&E bill. Our estimates are shown below.

Last Year's PG&E Bill	Next Year's PG&E Bill
\$13,802	\$5,329

PG&E Bill Offset:	61 %
Year 1 Savings:	\$8,473
25-Year Savings:	\$407,488

Your Current Cost Per kWh: **\$0.27 / kWh**



Return On Investment

Solar Proposal | How much does the system cost?

Allterra always keeps an eye out for new technology so you can be sure you are getting the best equipment at a competitive price. The system cost includes all permitting, solar equipment, warranties, monitoring, and labor for design and installation. Allterra installs a turnkey solar PV system and provides all the logistical support needed to get your solar power plant up and running.

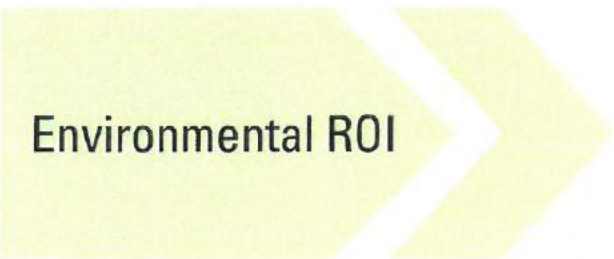
Total Amount	\$142,182.00	Average Price for Solar Electricity \$0.15 / kWh
Less Federal Tax Credit:	(\$0.00)	
Less MACRs Depreciation (year 1):	(\$0.00)	
Net Project Price (year 1)	\$142,182.00	

Return On Investment | There are lots of reasons to go solar.



Your Financial Benefits

Internal Rate of Return (IRR):	8.09 %
Payback Period (Years):	12.5 yrs
25-yr Project Savings:	\$265,306
Net Present Value (NPV):	\$166,550.94



You will offset these harmful greenhouse gases

CO ₂ Reductions	56877.16 lbs/yr
NO _x Reductions	19.49 lbs/yr
SO ₂ Reductions	9.31 lbs/yr

Commercial Cash Flow Table – Cash Purchase

This table of estimated cash flows includes any tax effects, rate and cost inflation and other time-related cash-flow factors as detailed in Assumptions and Definitions.

Cash Flow Summary	Estimated Utility Bill w/o Project	Estimated Utility Bill with Project	Customer Payments ¹	Estimated Net Savings	Estimated Cumulative Savings
Upfront			(\$142,182)	(\$142,182)	(\$142,182)
Year 1	(\$13,802)	(\$5,329)		\$8,473	(\$133,709)
Year 2	(\$14,561)	(\$5,660)		\$8,901	(\$124,808)
Year 3	(\$15,362)	(\$6,011)		\$9,351	(\$115,457)
Year 4	(\$16,207)	(\$6,383)		\$9,824	(\$105,632)
Year 5	(\$17,099)	(\$6,778)		\$10,321	(\$95,312)
Year 6	(\$18,039)	(\$7,196)		\$10,843	(\$84,469)
Year 7	(\$19,031)	(\$7,640)		\$11,391	(\$73,078)
Year 8	(\$20,078)	(\$8,111)		\$11,967	(\$61,111)
Year 9	(\$21,182)	(\$8,610)		\$12,572	(\$48,540)
Year 10	(\$22,347)	(\$9,140)		\$13,207	(\$35,333)
Year 11	(\$23,576)	(\$9,701)		\$13,875	(\$21,458)
Year 12	(\$24,873)	(\$10,297)		\$14,576	(\$6,881)
Year 13	(\$26,241)	(\$10,928)		\$15,313	\$6,432
Year 14	(\$27,684)	(\$11,597)		\$16,087	\$24,519
Year 15	(\$29,207)	(\$12,306)		\$16,900	\$41,420
Year 16	(\$30,813)	(\$13,058)		\$17,755	\$59,174
Year 17	(\$32,508)	(\$13,856)		\$18,652	\$77,827
Year 18	(\$34,296)	(\$14,701)		\$19,595	\$97,422
Year 19	(\$36,182)	(\$15,597)		\$20,586	\$118,007
Year 20	(\$38,172)	(\$16,546)		\$21,626	\$139,633
Year 21	(\$40,272)	(\$17,553)		\$22,719	\$162,352
Year 22	(\$42,487)	(\$18,619)		\$23,867	\$186,219
Year 23	(\$44,823)	(\$19,750)		\$25,074	\$211,293
Year 24	(\$47,289)	(\$20,948)		\$26,341	\$237,634
Year 25	(\$49,890)	(\$22,217)		\$27,672	\$265,306

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

Annual Electricity Inflation Rate: 5.5 %

Discount Rate: 2.0 %

Annual Electricity Inflation Rate is the assumed rate (%) of electricity cost inflation per year and is based on the historical averages for PG&E.

The Discount Rate lowers the value of future cashflows.

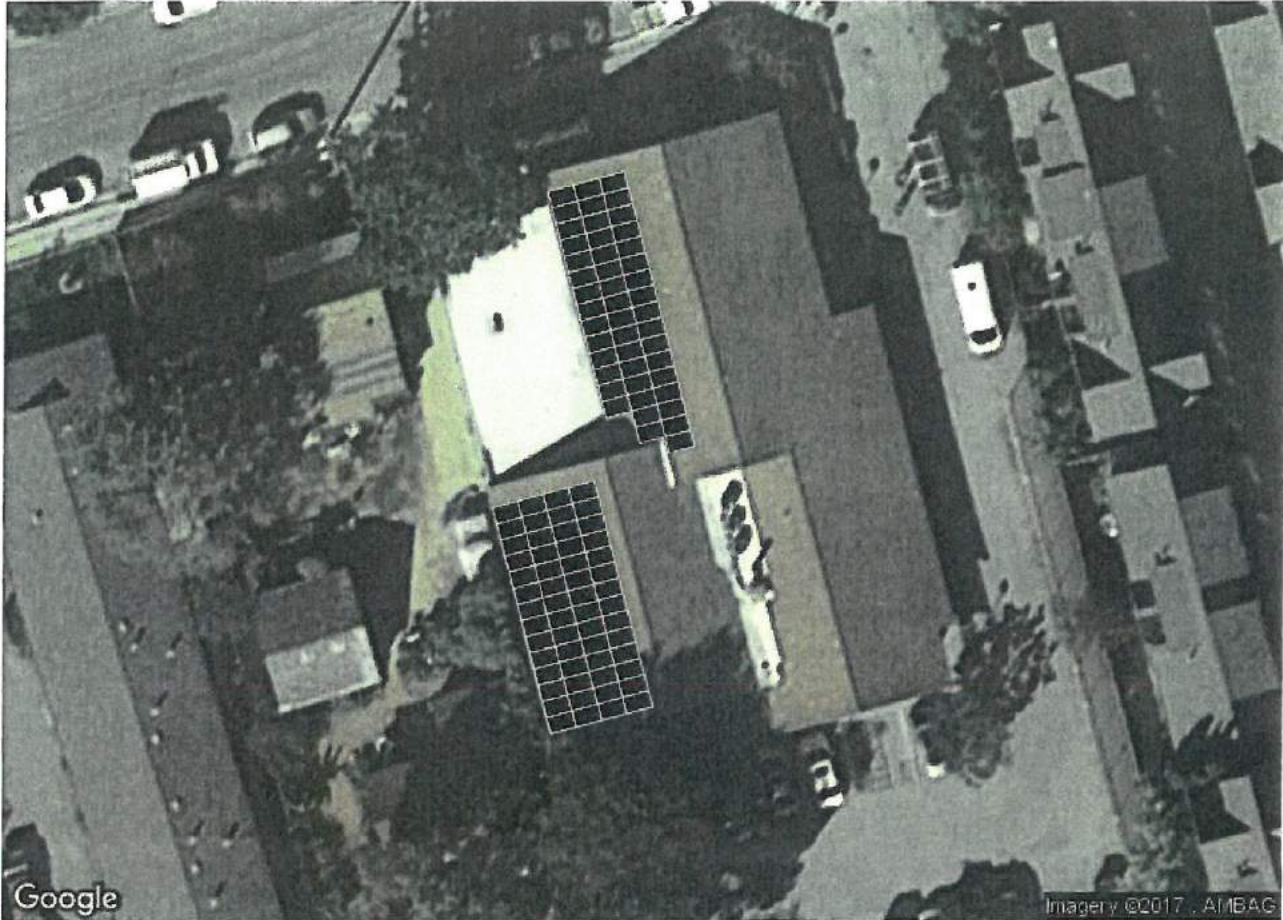
Home Value Increase refers to the amount you can expect to recoup from the investment if you were able to sell your property and is based on the following study: An Analysis of the Effects of Residential Photovoltaic Energy Systems on Home Sales Prices in California, Lawrence Berkeley National Laboratory, April 2011.

The Internal Rate of Return of an investment is the interest rate at which the net present value of the project's cost equals the net present value of the project's benefits.

Payback Period refers to the period of time required for the benefits of an investment to "repay" the sum of the original investment.



Preliminary PV Array Layout



Sales Consultant



Jet Quenemoen

Phone: (831) 331-9994

Email: jet@allterasolar.com

Proposal Date: November 28, 2017|Santa Cruz City - Branciforte Library Project|SN#7539, Solution C

This proposal is valid for 30 days from the proposal date.

Preliminary System Bill of Materials

Manufacturer	Product	Description	Qty	Unit
LG Electronics	LG350Q1C-A5	350W 60 Cell Monocrystalline Module, 1000V Max System Voltage	103.00	each
SolarEdge Technologies	SE14.4KUS	Three-phase 208V string inverter	4.00	each
SolarEdge Technologies	P700	Module Add-On for 2 x 72 cell modules and three phase SE inverters. For Commercial Installations for North America.	52.00	each
Allterra Solar	Labor & BOS	All labor & balance of materials	1	-



System Details

Solar PV System | Your Custom Design

Our team prepared a solar design for your business. Design specifications are shown below. All systems include monitoring.

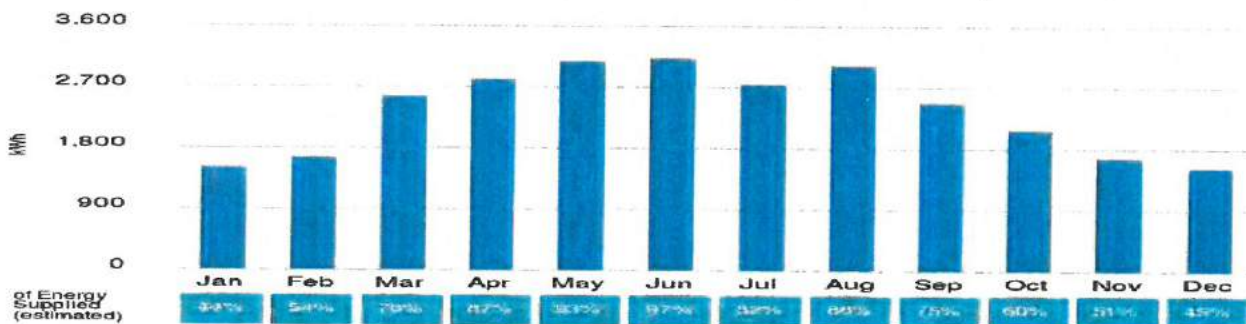
System Size:	21.105 DC kW (STC)
Number of Panels:	63
Solar Panel Type:	LG Electronics LG335N1C-A5
Inverter Type:	1 SMA America STP24000TL-US-10 (480V)

Solar Power Production | How much electricity will my system generate?

Solar will generate electricity and PG&E will credit your account based on how many kilowatt-hours (kWh) the system produces. Solar power production estimates are shown below.

Year 1 Production: **28,454 kWh** PG&E Usage Offset: **71 %**

Solar Electricity Generated (estimated)



PG&E Bill Offset | What will my PG&E bill be after the solar is up and running?

Solar will provide most of the power for your facility and reduce your PG&E bill. Our estimates are shown below.

Last Year's PG&E Bill	Next Year's PG&E Bill	PG&E Bill Offset:	51 %
\$9,090	\$4,452	Year 1 Savings:	\$4,638
		25-Year Savings:	\$169,090

Your Current Cost Per kWh: **\$0.23 / kWh**



Return On Investment

Solar Proposal | How much does the system cost?

Allterra always keeps an eye out for new technology so you can be sure you are getting the best equipment at a competitive price. The system cost includes all permitting, solar equipment, warranties, monitoring, and labor for design and installation. Allterra installs a turnkey solar PV system and provides all the logistical support needed to get your solar power plant up and running.

Total Amount	\$89,693.00	Average Price for Solar Electricity \$0.16 / kWh
Less Federal Tax Credit:	(\$0.00)	
Less MACRS Depreciation (year 1):	(\$0.00)	
Net Project Price (year 1)	\$89,693.00	

Return On Investment | There are lots of reasons to go solar.

Financial ROI

Your Financial Benefits

Internal Rate of Return (IRR):	4.88 %
Payback Period (Years):	15.5 yrs
25-yr Project Savings:	\$79,397
Net Present Value (NPV):	\$40,974.63

Environmental ROI

You will offset these harmful greenhouse gases

CO ₂ Reductions	31470.12 lbs/yr
NO _x Reductions	10.78 lbs/yr
SO ₂ Reductions	5.15 lbs/yr

Commercial Cash Flow Table – Cash Purchase

This table of estimated cash flows includes any tax effects, rate and cost inflation and other time-related cash-flow factors as detailed in Assumptions and Definitions.

Cash Flow Summary	Estimated Utility Bill w/o Project	Estimated Utility Bill with Project	Customer Payments ¹	Estimated Net Savings	Estimated Cumulative Savings
Upfront			(\$89,693)	(\$89,693)	(\$89,693)
Year 1	(\$9,090)	(\$4,452)		\$4,638	(\$85,055)
Year 2	(\$9,362)	(\$4,585)		\$4,777	(\$80,278)
Year 3	(\$9,643)	(\$4,723)		\$4,920	(\$75,358)
Year 4	(\$9,933)	(\$4,865)		\$5,068	(\$70,290)
Year 5	(\$10,231)	(\$5,011)		\$5,220	(\$65,070)
Year 6	(\$10,537)	(\$5,161)		\$5,376	(\$59,694)
Year 7	(\$10,854)	(\$5,316)		\$5,538	(\$54,156)
Year 8	(\$11,179)	(\$5,475)		\$5,704	(\$48,452)
Year 9	(\$11,515)	(\$5,639)		\$5,875	(\$42,577)
Year 10	(\$11,860)	(\$5,809)		\$6,051	(\$36,526)
Year 11	(\$12,216)	(\$5,983)		\$6,233	(\$30,293)
Year 12	(\$12,582)	(\$6,162)		\$6,420	(\$23,873)
Year 13	(\$12,960)	(\$6,347)		\$6,612	(\$17,261)
Year 14	(\$13,348)	(\$6,538)		\$6,811	(\$10,450)
Year 15	(\$13,749)	(\$6,734)		\$7,015	(\$3,435)
Year 16	(\$14,161)	(\$6,936)		\$7,225	\$3,790
Year 17	(\$14,586)	(\$7,144)		\$7,442	\$11,232
Year 18	(\$15,024)	(\$7,358)		\$7,665	\$18,898
Year 19	(\$15,474)	(\$7,579)		\$7,895	\$26,793
Year 20	(\$15,939)	(\$7,806)		\$8,132	\$34,926
Year 21	(\$16,417)	(\$8,041)		\$8,376	\$43,302
Year 22	(\$16,909)	(\$8,282)		\$8,628	\$51,930
Year 23	(\$17,417)	(\$8,530)		\$8,886	\$60,816
Year 24	(\$17,939)	(\$8,786)		\$9,153	\$69,969
Year 25	(\$18,477)	(\$9,050)		\$9,428	\$79,397

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

Annual Electricity Inflation Rate: 3.0 %

Discount Rate: 2.0 %

Annual Electricity Inflation Rate is the assumed rate (%) of electricity cost inflation per year and is based on the historical averages for PG&E.

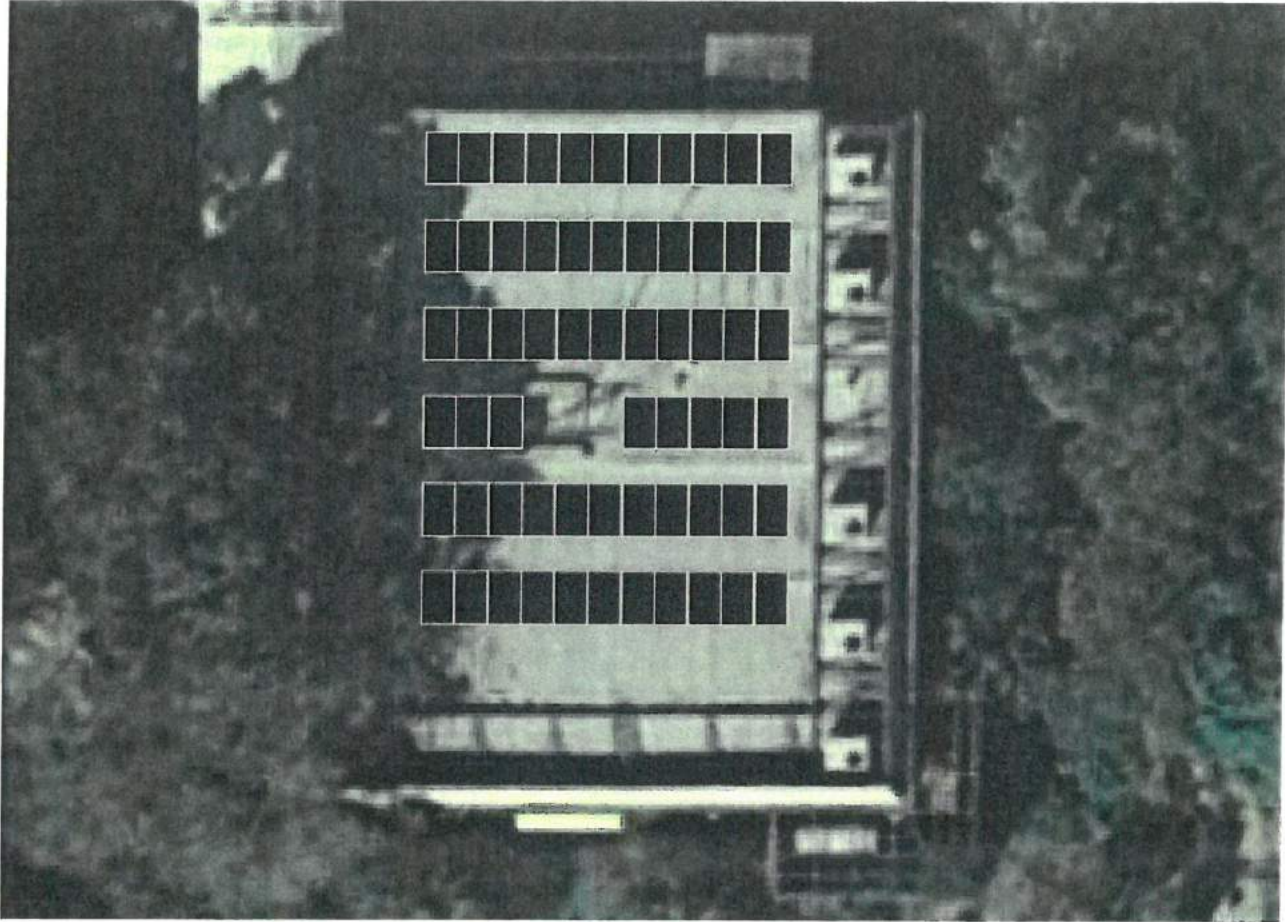
The Discount Rate lowers the value of future cashflows.

Home Value Increase refers to the amount you can expect to recoup from the investment if you were able to sell your property and is based on the following study: An Analysis of the Effects of Residential Photovoltaic Energy Systems on Home Sales Prices in California, Lawrence Berkeley National Laboratory, April 2011.

The Internal Rate of Return of an investment is the interest rate at which the net present value of the project's cost equals the net present value of the project's benefits. Payback Period refers to the period of time required for the benefits of an investment to "repay" the sum of the original investment.



Preliminary PV Array Layout



Sales Consultant



James Allen

Phone: (831) 334-0696

Email: james@allterraenv.com

Proposal Date: November 28, 2017|Santa Cruz City - Capitola Library Project|SN#8399, Solution A

This proposal is valid for 30 days from the proposal date.

Preliminary System Bill of Materials

Manufacturer	Product	Description	Qty	Unit
LG Electronics	LG335N1C-A5	335W 60 cell Monocrystalline module with Cello technology	63.00	each
SMA America	STP24000TL-US-10 (480V)	24kW, 480Vac 3-phase, Sunny Tripower Transformerless Utility-Interactive Inverter	1.00	each
Allterra Solar	Labor & BOS	All labor & balance of materials	1	-



System Details

Solar PV System | Your Custom Design

Our team prepared a solar design for your business. Design specifications are shown below. All systems include monitoring.

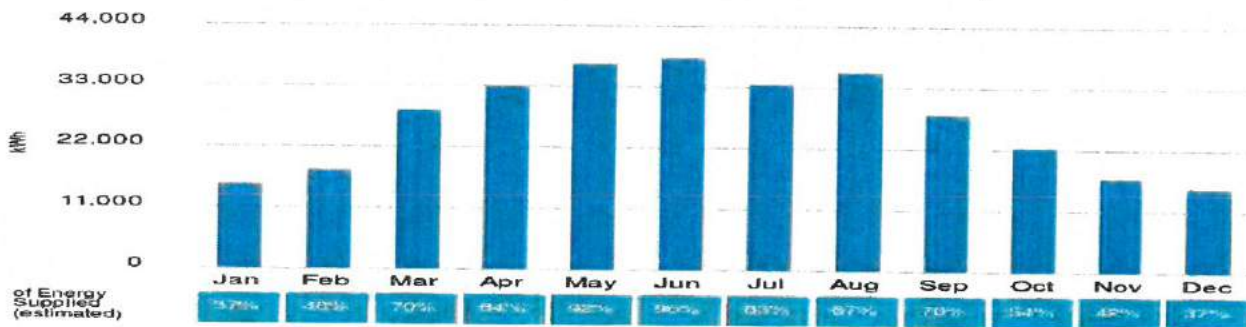
System Size: 230.680 DC kW (STC)
 Number of Panels: 632
 Solar Panel Type: LG Electronics LG365Q1C-A5
 Inverter Type: 8 SolarEdge Technologies SE14.4KUS

Solar Power Production | How much electricity will my system generate?

Solar will generate electricity and PG&E will credit your account based on how many kilowatt-hours (kWh) the system produces. Solar power production estimates are shown below.

Year 1 Production: **324,045 kWh** PG&E Usage Offset: **67 %**

Solar Electricity Generated (estimated)



PG&E Bill Offset | What will my PG&E bill be after the solar is up and running?

Solar will provide most of the power for your facility and reduce your PG&E bill. Our estimates are shown below.

Last Year's PG&E Bill	Next Year's PG&E Bill	PG&E Bill Offset:	73 %
\$97,106	\$25,937	Year 1 Savings:	\$71,169
		25-Year Savings:	\$3,433,457

Your Current Cost Per kWh: **\$0.20 / kWh**



Return On Investment

Solar Proposal | How much does the system cost?

Allterra always keeps an eye out for new technology so you can be sure you are getting the best equipment at a competitive price. The system cost includes all permitting, solar equipment, warranties, monitoring, and labor for design and installation. Allterra installs a turnkey solar PV system and provides all the logistical support needed to get your solar power plant up and running.

Total Amount	\$738,176.00	<hr/> Average Price for Solar Electricity \$0.12 / kWh <hr/>
Less Federal Tax Credit:	(\$0.00)	
Less MACRs Depreciation (year 1):	(\$0.00)	
Net Project Price (year 1)	\$738,176.00	

Return On Investment | There are lots of reasons to go solar.



Your Financial Benefits

Internal Rate of Return (IRR):	13.23 %
Payback Period (Years):	8.5 yrs
25-yr Project Savings:	\$2,695,281
Net Present Value (NPV):	\$1,862,620.26



You will offset these harmful greenhouse gases

CO ₂ Reductions	358393.77 lbs/yr
NO _x Reductions	122.81 lbs/yr
SO ₂ Reductions	58.65 lbs/yr

Commercial Cash Flow Table – Cash Purchase

This table of estimated cash flows includes any tax effects, rate and cost inflation and other time-related cash-flow factors as detailed in Assumptions and Definitions.

Cash Flow Summary	Estimated Utility Bill w/o Project	Estimated Utility Bill with Project	Customer Payments ¹	Estimated Net Savings	Estimated Cumulative Savings
Upfront			(\$738,176)	(\$738,176)	(\$738,176)
Year 1	(\$97,106)	(\$25,937)		\$71,169	(\$667,007)
Year 2	(\$102,447)	(\$27,664)		\$74,783	(\$592,224)
Year 3	(\$108,082)	(\$29,501)		\$78,581	(\$513,644)
Year 4	(\$114,026)	(\$31,456)		\$82,570	(\$431,074)
Year 5	(\$120,298)	(\$33,534)		\$86,764	(\$344,310)
Year 6	(\$126,914)	(\$35,745)		\$91,169	(\$253,141)
Year 7	(\$133,894)	(\$38,096)		\$95,798	(\$157,342)
Year 8	(\$141,258)	(\$40,595)		\$100,663	(\$56,679)
Year 9	(\$149,027)	(\$43,252)		\$105,775	\$49,095
Year 10	(\$157,224)	(\$46,078)		\$111,146	\$160,242
Year 11	(\$165,872)	(\$49,081)		\$116,791	\$277,033
Year 12	(\$174,995)	(\$52,273)		\$122,722	\$399,755
Year 13	(\$184,620)	(\$55,666)		\$128,954	\$528,709
Year 14	(\$194,774)	(\$59,271)		\$135,503	\$664,212
Year 15	(\$205,486)	(\$63,103)		\$142,383	\$806,595
Year 16	(\$216,788)	(\$67,174)		\$149,614	\$956,208
Year 17	(\$228,711)	(\$71,500)		\$157,211	\$1,113,419
Year 18	(\$241,291)	(\$76,097)		\$165,195	\$1,278,614
Year 19	(\$254,562)	(\$80,979)		\$173,583	\$1,452,197
Year 20	(\$268,562)	(\$86,165)		\$182,397	\$1,634,593
Year 21	(\$283,333)	(\$91,674)		\$191,659	\$1,826,252
Year 22	(\$298,916)	(\$97,525)		\$201,391	\$2,027,644
Year 23	(\$315,357)	(\$103,739)		\$211,618	\$2,239,262
Year 24	(\$332,702)	(\$110,338)		\$222,364	\$2,461,626
Year 25	(\$351,000)	(\$117,345)		\$233,655	\$2,695,281

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

Annual Electricity Inflation Rate: 5.5 %

Discount Rate: 2.0 %

Annual Electricity Inflation Rate is the assumed rate (%) of electricity cost inflation per year and is based on the historical averages for PG&E.

The Discount Rate lowers the value of future cashflows.

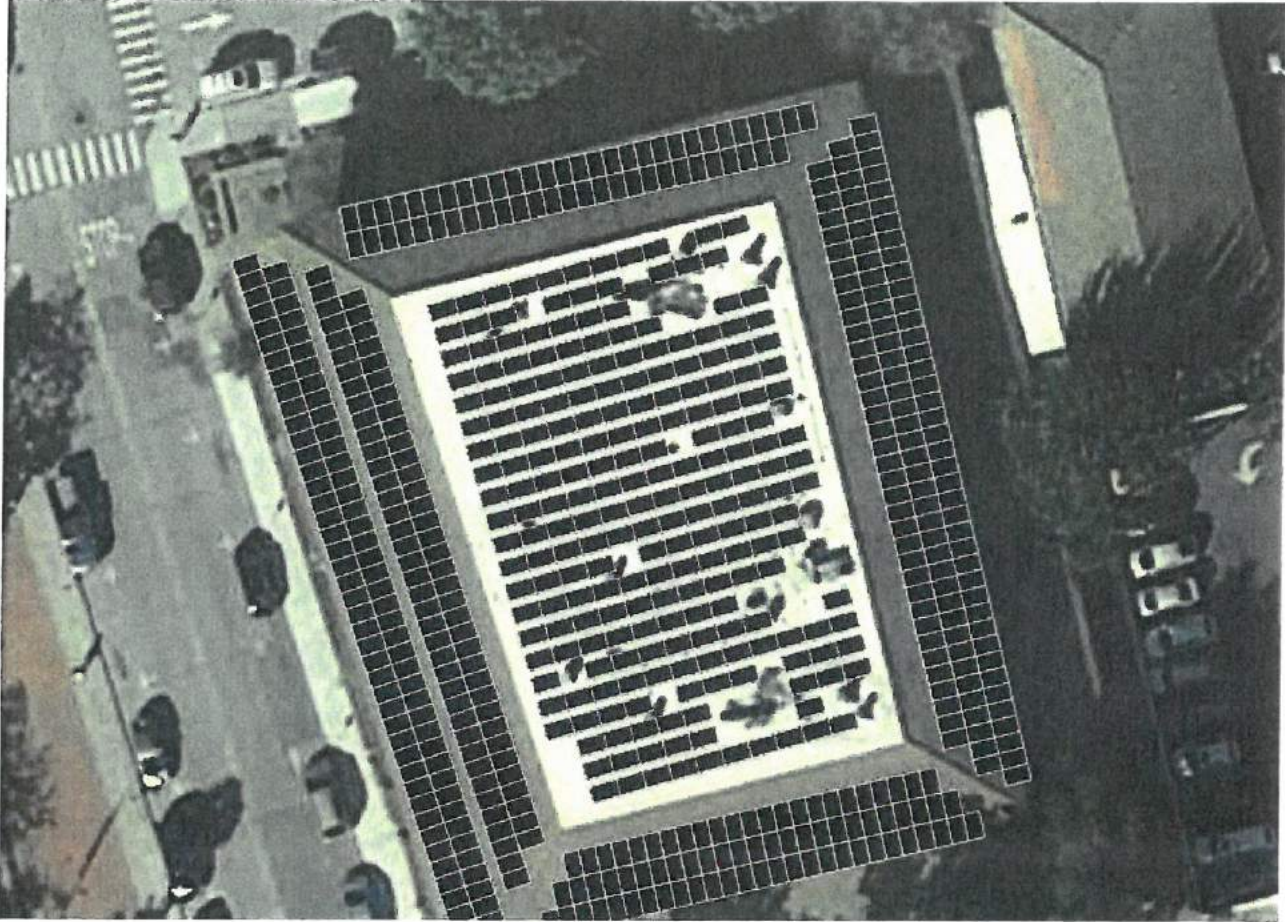
Home Value Increase refers to the amount you can expect to recoup from the investment if you were able to sell your property and is based on the following study: An Analysis of the Effects of Residential Photovoltaic Energy Systems on Home Sales Prices in California, Lawrence Berkeley National Laboratory, April 2011.

The Internal Rate of Return of an investment is the interest rate at which the net present value of the project's cost equals the net present value of the project's benefits.

Payback Period refers to the period of time required for the benefits of an investment to "repay" the sum of the original investment.



Preliminary PV Array Layout



Sales Consultant



James Allen

Phone: (831) 334-0696

Email: james@allterraenv.com

Proposal Date: October 26, 2017|Santa Cruz City - Downtown Library Project|SN#8400, Solution A

This proposal is valid for 30 days from the proposal date.

Preliminary System Bill of Materials

Manufacturer	Product	Description	Qty	Unit
LG Electronics	LG365Q1C-A5	365W 60 Cell Monocrystalline Module, 1000V Max System Voltage	632.00	each
SolarEdge Technologies	SE14.4KUS	Three-phase 208V string inverter	8.00	each
SolarEdge Technologies	P700	Module Add-On for 2 x 72 cell modules and three phase SE inverters. For Commercial Installations for North America.	316.00	each
Allterra Solar	Labor & BOS	All labor & balance of materials	1	-



System Details

Solar PV System | Your Custom Design

Our team prepared a solar design for your business. Design specifications are shown below. All systems include monitoring.

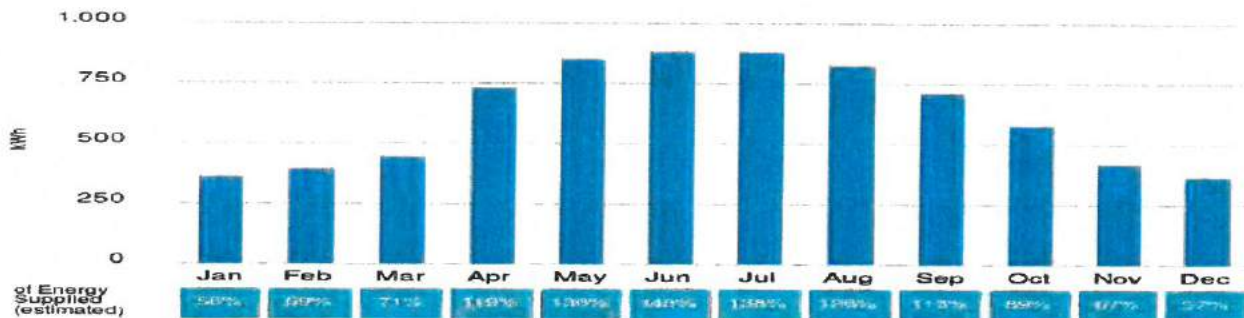
System Size:	5.360 DC kW (STC)
Number of Panels:	16
Solar Panel Type:	LG Electronics LG335N1C-A5
Inverter Type:	16 Enphase Energy IQ6PLUS-72-2-US (240Vac)

Solar Power Production | How much electricity will my system generate?

Solar will generate electricity and PG&E will credit your account based on how many kilowatt-hours (kwh) the system produces. Solar power production estimates are shown below.

Year 1 Production: **7,482 kWh** PG&E Usage Offset: **99 %**

Solar Electricity Generated (estimated)



PG&E Bill Offset | What will my PG&E bill be after the solar is up and running?

Solar will provide most of the power for your facility and reduce your PG&E bill. Our estimates are shown below.

Last Year's PG&E Bill	Next Year's PG&E Bill	PG&E Bill Offset:	87 %
\$1,908	\$240	Year 1 Savings:	\$1,668
		25-Year Savings:	\$85,329

Your Current Cost Per kWh: **\$0.25 / kWh**



Return On Investment

Solar Proposal | How much does the system cost?

Allterra always keeps an eye out for new technology so you can be sure you are getting the best equipment at a competitive price. The system cost includes all permitting, solar equipment, warranties, monitoring, and labor for design and installation. Allterra installs a turnkey solar PV system and provides all the logistical support needed to get your solar power plant up and running.

Total Amount	\$25,065.20	Average Price for Solar Electricity \$0.17 / kWh
Less Federal Tax Credit:	(\$0.00)	
Less MACRs Depreciation (year 1):	(\$0.00)	
Net Project Price (year 1)	\$25,065.20	

Return On Investment | There are lots of reasons to go solar.



Your Financial Benefits

Internal Rate of Return (IRR):	9.57 %
Payback Period (Years):	11.3 yrs
25-yr Project Savings:	\$60,264
Net Present Value (NPV):	\$39,318.38



You will offset these harmful greenhouse gases

CO ₂ Reductions	8275.09 lbs/yr
NO _x Reductions	2.84 lbs/yr
SO ₂ Reductions	1.35 lbs/yr

Commercial Cash Flow Table – Cash Purchase

This table of estimated cash flows includes any tax effects, rate and cost inflation and other time-related cash-flow factors as detailed in Assumptions and Definitions.

Cash Flow Summary	Estimated Utility Bill w/o Project	Estimated Utility Bill with Project	Customer Payments ¹	Estimated Net Savings	Estimated Cumulative Savings
Upfront			(\$25,065)	(\$25,065)	(\$25,065)
Year 1	(\$1,908)	(\$240)		\$1,668	(\$23,397)
Year 2	(\$2,013)	(\$253)		\$1,760	(\$21,637)
Year 3	(\$2,124)	(\$267)		\$1,857	(\$19,781)
Year 4	(\$2,240)	(\$282)		\$1,959	(\$17,822)
Year 5	(\$2,364)	(\$297)		\$2,067	(\$15,755)
Year 6	(\$2,494)	(\$313)		\$2,180	(\$13,575)
Year 7	(\$2,631)	(\$331)		\$2,300	(\$11,275)
Year 8	(\$2,775)	(\$349)		\$2,427	(\$8,848)
Year 9	(\$2,928)	(\$368)		\$2,560	(\$6,288)
Year 10	(\$3,089)	(\$388)		\$2,701	(\$3,587)
Year 11	(\$3,259)	(\$410)		\$2,849	(\$738)
Year 12	(\$3,438)	(\$432)		\$3,006	\$2,268
Year 13	(\$3,627)	(\$456)		\$3,171	\$5,440
Year 14	(\$3,827)	(\$481)		\$3,346	\$8,785
Year 15	(\$4,037)	(\$508)		\$3,530	\$12,315
Year 16	(\$4,259)	(\$535)		\$3,724	\$16,039
Year 17	(\$4,494)	(\$565)		\$3,929	\$19,968
Year 18	(\$4,741)	(\$596)		\$4,145	\$24,113
Year 19	(\$5,002)	(\$629)		\$4,373	\$28,486
Year 20	(\$5,277)	(\$663)		\$4,613	\$33,100
Year 21	(\$5,567)	(\$700)		\$4,867	\$37,967
Year 22	(\$5,873)	(\$738)		\$5,135	\$43,102
Year 23	(\$6,196)	(\$779)		\$5,417	\$48,519
Year 24	(\$6,537)	(\$822)		\$5,715	\$54,234
Year 25	(\$6,897)	(\$867)		\$6,030	\$60,264

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

Annual Electricity Inflation Rate: 5.5 %

Discount Rate: 2.0 %

Annual Electricity Inflation Rate is the assumed rate (%) of electricity cost inflation per year and is based on the historical averages for PG&E.

The Discount Rate lowers the value of future cashflows.

Home Value Increase refers to the amount you can expect to recoup from the investment if you were able to sell your property and is based on the following study: An Analysis of the Effects of Residential Photovoltaic Energy Systems on Home Sales Prices in California, Lawrence Berkeley National Laboratory, April 2011.

The Internal Rate of Return of an investment is the interest rate at which the net present value of the project's cost equals the net present value of the project's benefits.

Payback Period refers to the period of time required for the benefits of an investment to "repay" the sum of the original investment.



Preliminary PV Array Layout



Sales Consultant



James Allen

Phone: (831) 334-0696

Email: james@allterraenv.com

Proposal Date: November 29, 2017|Santa Cruz City - Felton Library

Project|SN#8401, Solution A

This proposal is valid for 30 days from the proposal date.

Preliminary System Bill of Materials

Manufacturer	Product	Description	Qty	Unit
Enphase Energy	IQ6PLUS-72-2-US (240Vac)	290VA 240Vac microinverter for 60 and 72 cell modules	16.00	each
LG Electronics	LG335N1C-A5	335W 60 cell Monocrystalline module with Cello technology	16.00	each
Allterra Solar	Labor & BOS	All labor & balance of materials	1	-



System Details

Solar PV System | Your Custom Design

Our team prepared a solar design for your business. Design specifications are shown below. All systems include monitoring.

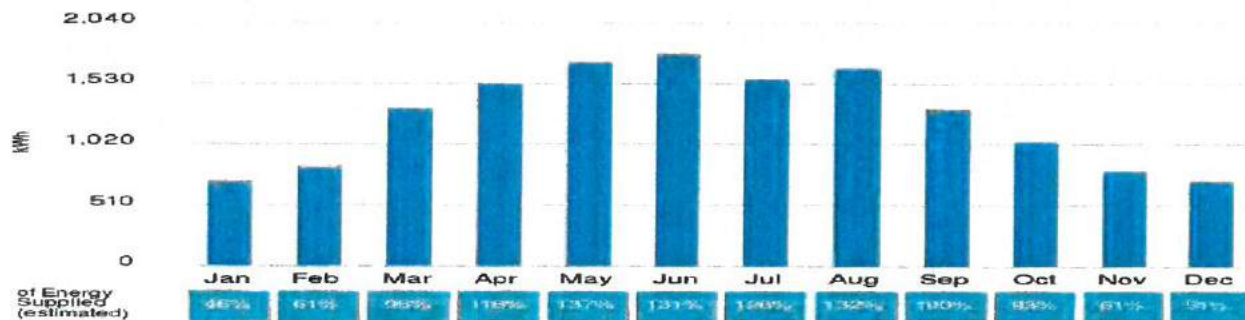
System Size:	11.200 DC kW (STC)
Number of Panels:	32
Solar Panel Type:	LG Electronics LG350Q1C-A5
Inverter Type:	32 Enphase Energy IQ6PLUS-72-2-US (240Vac)

Solar Power Production | How much electricity will my system generate?

Solar will generate electricity and PG&E will credit your account based on how many kilowatt-hours (kWh) the system produces. Solar power production estimates are shown below.

Year 1 Production: **15,083 kWh** PG&E Usage Offset: **94 %**

Solar Electricity Generated (estimated)



PG&E Bill Offset | What will my PG&E bill be after the solar is up and running?

Solar will provide most of the power for your facility and reduce your PG&E bill. Our estimates are shown below.

Last Year's PG&E Bill	Next Year's PG&E Bill
\$3,734	\$343

PG&E Bill Offset:	91 %
Year 1 Savings:	\$3,391
25-Year Savings:	\$173,468

Your Current Cost Per kWh: **\$0.23 / kWh**



Return On Investment

Solar Proposal | How much does the system cost?

Allterra always keeps an eye out for new technology so you can be sure you are getting the best equipment at a competitive price. The system cost includes all permitting, solar equipment, warranties, monitoring, and labor for design and installation. Allterra installs a turnkey solar PV system and provides all the logistical support needed to get your solar power plant up and running.

Total Amount	\$50,000.00	Average Price for Solar Electricity \$0.17 / kWh
Less Federal Tax Credit:	(\$0.00)	
Less MACRs Depreciation (year 1):	(\$0.00)	
Net Project Price (year 1)	\$50,000.00	

Return On Investment | There are lots of reasons to go solar.

Financial ROI

Your Financial Benefits

Internal Rate of Return (IRR):	9.76 %
Payback Period (Years):	11.1 yrs
25-yr Project Savings:	\$123,468
Net Present Value (NPV):	\$80,886.76

Environmental ROI

You will offset these harmful greenhouse gases

CO ₂ Reductions	16681.80 lbs/yr
NO _x Reductions	5.72 lbs/yr
SO ₂ Reductions	2.73 lbs/yr

Commercial Cash Flow Table – Cash Purchase

This table of estimated cash flows includes any tax effects, rate and cost inflation and other time-related cash-flow factors as detailed in Assumptions and Definitions.

Cash Flow Summary	Estimated Utility Bill w/o Project	Estimated Utility Bill with Project	Customer Payments ¹	Estimated Net Savings	Estimated Cumulative Savings
Upfront			(\$50,000)	(\$50,000)	(\$50,000)
Year 1	(\$3,734)	(\$343)		\$3,391	(\$46,609)
Year 2	(\$3,940)	(\$362)		\$3,578	(\$43,031)
Year 3	(\$4,156)	(\$382)		\$3,774	(\$39,257)
Year 4	(\$4,385)	(\$403)		\$3,982	(\$35,275)
Year 5	(\$4,626)	(\$425)		\$4,201	(\$31,074)
Year 6	(\$4,881)	(\$448)		\$4,432	(\$26,641)
Year 7	(\$5,149)	(\$473)		\$4,676	(\$21,965)
Year 8	(\$5,432)	(\$499)		\$4,933	(\$17,032)
Year 9	(\$5,731)	(\$527)		\$5,204	(\$11,828)
Year 10	(\$6,046)	(\$556)		\$5,491	(\$6,337)
Year 11	(\$6,379)	(\$586)		\$5,793	(\$545)
Year 12	(\$6,730)	(\$618)		\$6,111	\$5,566
Year 13	(\$7,100)	(\$652)		\$6,447	\$12,014
Year 14	(\$7,490)	(\$688)		\$6,802	\$18,816
Year 15	(\$7,902)	(\$726)		\$7,176	\$25,992
Year 16	(\$8,337)	(\$766)		\$7,571	\$33,563
Year 17	(\$8,795)	(\$808)		\$7,987	\$41,550
Year 18	(\$9,279)	(\$853)		\$8,426	\$49,976
Year 19	(\$9,789)	(\$899)		\$8,890	\$58,866
Year 20	(\$10,328)	(\$949)		\$9,379	\$68,245
Year 21	(\$10,896)	(\$1,001)		\$9,895	\$78,139
Year 22	(\$11,495)	(\$1,056)		\$10,439	\$88,578
Year 23	(\$12,127)	(\$1,114)		\$11,013	\$99,591
Year 24	(\$12,794)	(\$1,176)		\$11,619	\$111,210
Year 25	(\$13,498)	(\$1,240)		\$12,258	\$123,468

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

Annual Electricity Inflation Rate: 5.5 %

Discount Rate: 2.0 %

Annual Electricity Inflation Rate is the assumed rate (%) of electricity cost inflation per year and is based on the historical averages for PG&E.

The Discount Rate lowers the value of future cashflows.

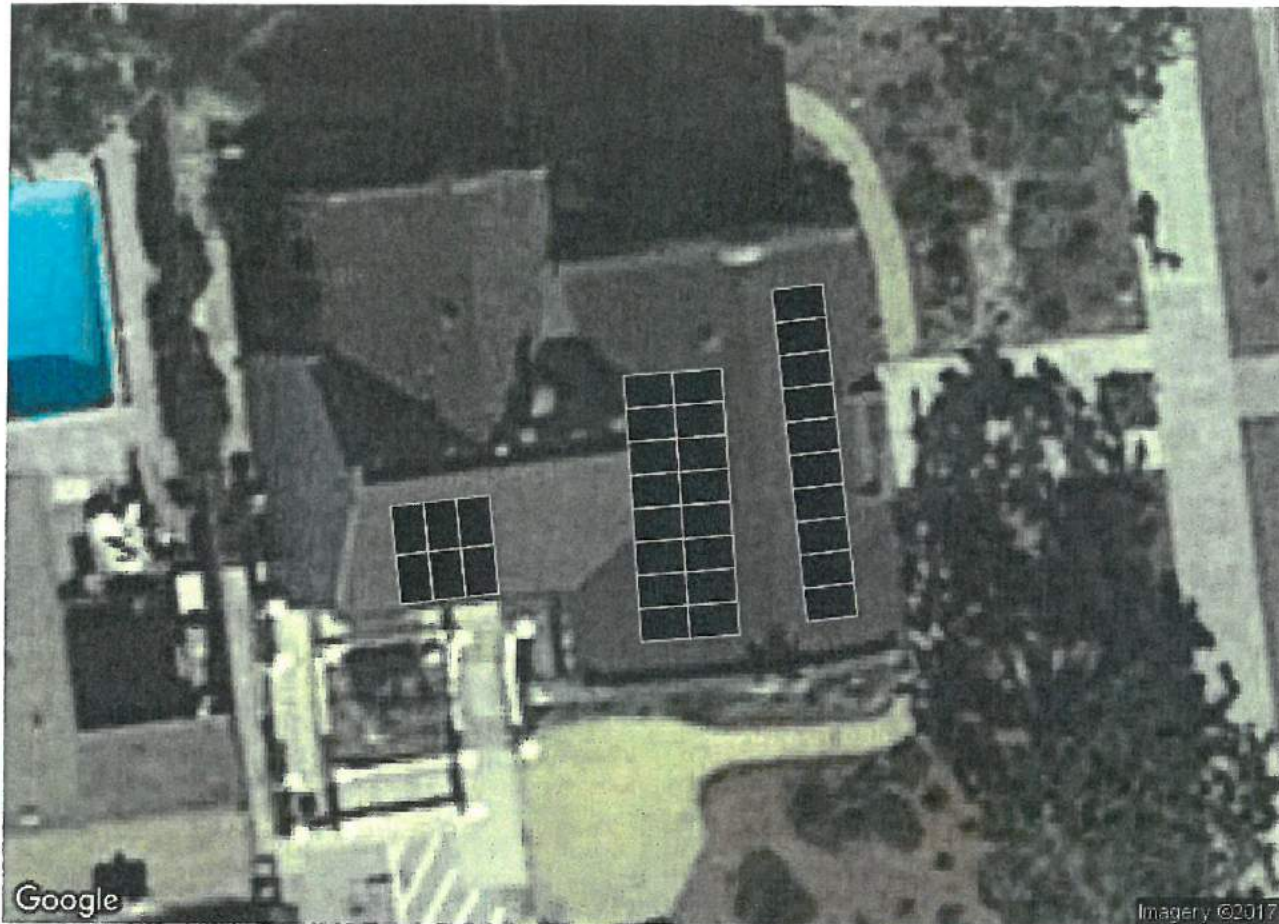
Home Value Increase refers to the amount you can expect to recoup from the investment if you were able to sell your property and is based on the following study: An Analysis of the Effects of Residential Photovoltaic Energy Systems on Home Sales Prices in California, Lawrence Berkeley National Laboratory, April 2011.

The Internal Rate of Return of an investment is the interest rate at which the net present value of the project's cost equals the net present value of the project's benefits.

Payback Period refers to the period of time required for the benefits of an investment to "repay" the sum of the original investment.



Preliminary PV Array Layout



Sales Consultant



Jet Quenemoen

Phone: (831) 331-9994

Email: jet@allterasolar.com

Proposal Date: November 28, 2017|Santa Cruz City - Garfield Library

Project|SN#7538, Solution D

This proposal is valid for 30 days from the proposal date.

Preliminary System Bill of Materials

Manufacturer	Product	Description	Qty	Unit
LG Electronics	LG350Q1C-A5	350W 60 Cell Monocrystalline Module, 1000V Max System Voltage	32.00	each
Enphase Energy	IQ6PLUS-72-2-US (240Vac)	290VA 240Vac microinverter for 60 and 72 cell modules	32.00	each
Allterra Solar	Labor & BOS	All labor & balance of materials	1	-
Enphase	Module Level	Enphase web-based, module-level monitoring.	1.00	each
Allterra Solar	Upgrade Service	Upgraded service & main panel	1.00	each



System Details

Solar PV System | Your Custom Design

Our team prepared a solar design for your business. Design specifications are shown below. All systems include monitoring.

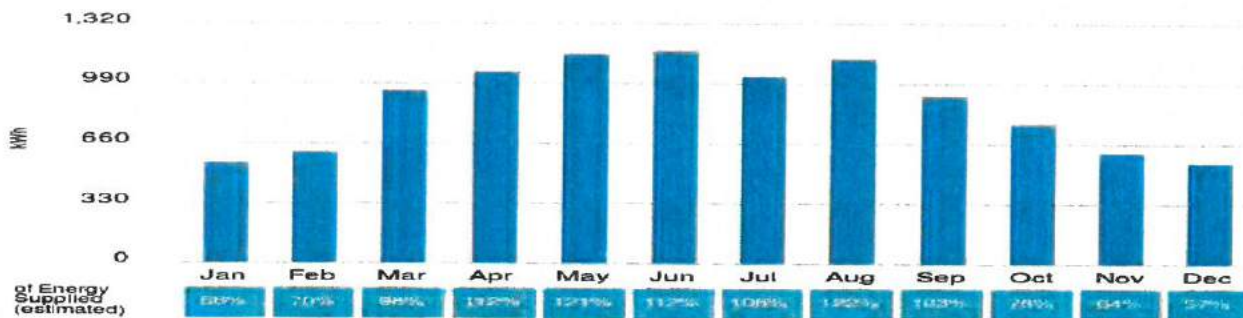
System Size:	7.035 DC kW (STC)
Number of Panels:	21
Solar Panel Type:	LG Electronics LG335N1C-A5
Inverter Type:	21 Enphase Energy IQ6PLUS-72-2-US (240Vac)

Solar Power Production | How much electricity will my system generate?

Solar will generate electricity and PG&E will credit your account based on how many kilowatt-hours (kWh) the system produces. Solar power production estimates are shown below.

Year 1 Production: **10,575 kWh** PG&E Usage Offset: **91 %**

Solar Electricity Generated (estimated)



PG&E Bill Offset | What will my PG&E bill be after the solar is up and running?

Solar will provide most of the power for your facility and reduce your PG&E bill. Our estimates are shown below.

Last Year's PG&E Bill	Next Year's PG&E Bill
\$2,791	\$407

PG&E Bill Offset:	85 %
Year 1 Savings:	\$2,384
25-Year Savings:	\$83,518

Your Current Cost Per kWh: **\$0.24 / kWh**



Return On Investment

Solar Proposal | How much does the system cost?

Allterra always keeps an eye out for new technology so you can be sure you are getting the best equipment at a competitive price. The system cost includes all permitting, solar equipment, warranties, monitoring, and labor for design and installation. Allterra installs a turnkey solar PV system and provides all the logistical support needed to get your solar power plant up and running.

Total Amount	\$30,829.70	Average Price for Solar Electricity \$0.15 / kWh
Less Federal Tax Credit:	(\$0.00)	
Less MACRs Depreciation (year 1):	(\$0.00)	
Net Project Price (year 1)	\$30,829.70	

Return On Investment | There are lots of reasons to go solar.

Financial ROI

Your Financial Benefits

Internal Rate of Return (IRR):	8.45 %
Payback Period (Years):	11.2 yrs
25-yr Project Savings:	\$52,689
Net Present Value (NPV):	\$33,904.65

Environmental ROI

You will offset these harmful greenhouse gases

CO ₂ Reductions	11695.95 lbs/yr
NO _x Reductions	4.01 lbs/yr
SO ₂ Reductions	1.91 lbs/yr

Commercial Cash Flow Table – Cash Purchase

This table of estimated cash flows includes any tax effects, rate and cost inflation and other time-related cash-flow factors as detailed in Assumptions and Definitions.

Cash Flow Summary	Estimated Utility Bill w/o Project	Estimated Utility Bill with Project	Customer Payments ¹	Estimated Net Savings	Estimated Cumulative Savings
Upfront			(\$30,830)	(\$30,830)	(\$30,830)
Year 1	(\$2,791)	(\$407)		\$2,384	(\$28,446)
Year 2	(\$2,875)	(\$427)		\$2,448	(\$25,998)
Year 3	(\$2,961)	(\$447)		\$2,514	(\$23,484)
Year 4	(\$3,050)	(\$468)		\$2,582	(\$20,903)
Year 5	(\$3,141)	(\$490)		\$2,651	(\$18,252)
Year 6	(\$3,236)	(\$513)		\$2,723	(\$15,529)
Year 7	(\$3,333)	(\$537)		\$2,796	(\$12,733)
Year 8	(\$3,433)	(\$561)		\$2,871	(\$9,862)
Year 9	(\$3,536)	(\$587)		\$2,949	(\$6,914)
Year 10	(\$3,642)	(\$613)		\$3,028	(\$3,885)
Year 11	(\$3,751)	(\$641)		\$3,110	(\$776)
Year 12	(\$3,863)	(\$670)		\$3,194	\$2,418
Year 13	(\$3,979)	(\$700)		\$3,280	\$5,698
Year 14	(\$4,099)	(\$730)		\$3,368	\$9,066
Year 15	(\$4,222)	(\$763)		\$3,459	\$12,525
Year 16	(\$4,348)	(\$796)		\$3,552	\$16,077
Year 17	(\$4,479)	(\$831)		\$3,648	\$19,725
Year 18	(\$4,613)	(\$866)		\$3,747	\$23,472
Year 19	(\$4,751)	(\$904)		\$3,848	\$27,320
Year 20	(\$4,894)	(\$942)		\$3,952	\$31,271
Year 21	(\$5,041)	(\$983)		\$4,058	\$35,330
Year 22	(\$5,192)	(\$1,024)		\$4,168	\$39,498
Year 23	(\$5,348)	(\$1,067)		\$4,280	\$43,778
Year 24	(\$5,508)	(\$1,112)		\$4,396	\$48,174
Year 25	(\$5,673)	(\$1,159)		\$4,515	\$52,689

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

Annual Electricity Inflation Rate: 3.0 %

Discount Rate: 2.0 %

Annual Electricity Inflation Rate is the assumed rate (%) of electricity cost inflation per year and is based on the historical averages for PG&E.

The Discount Rate lowers the value of future cashflows.

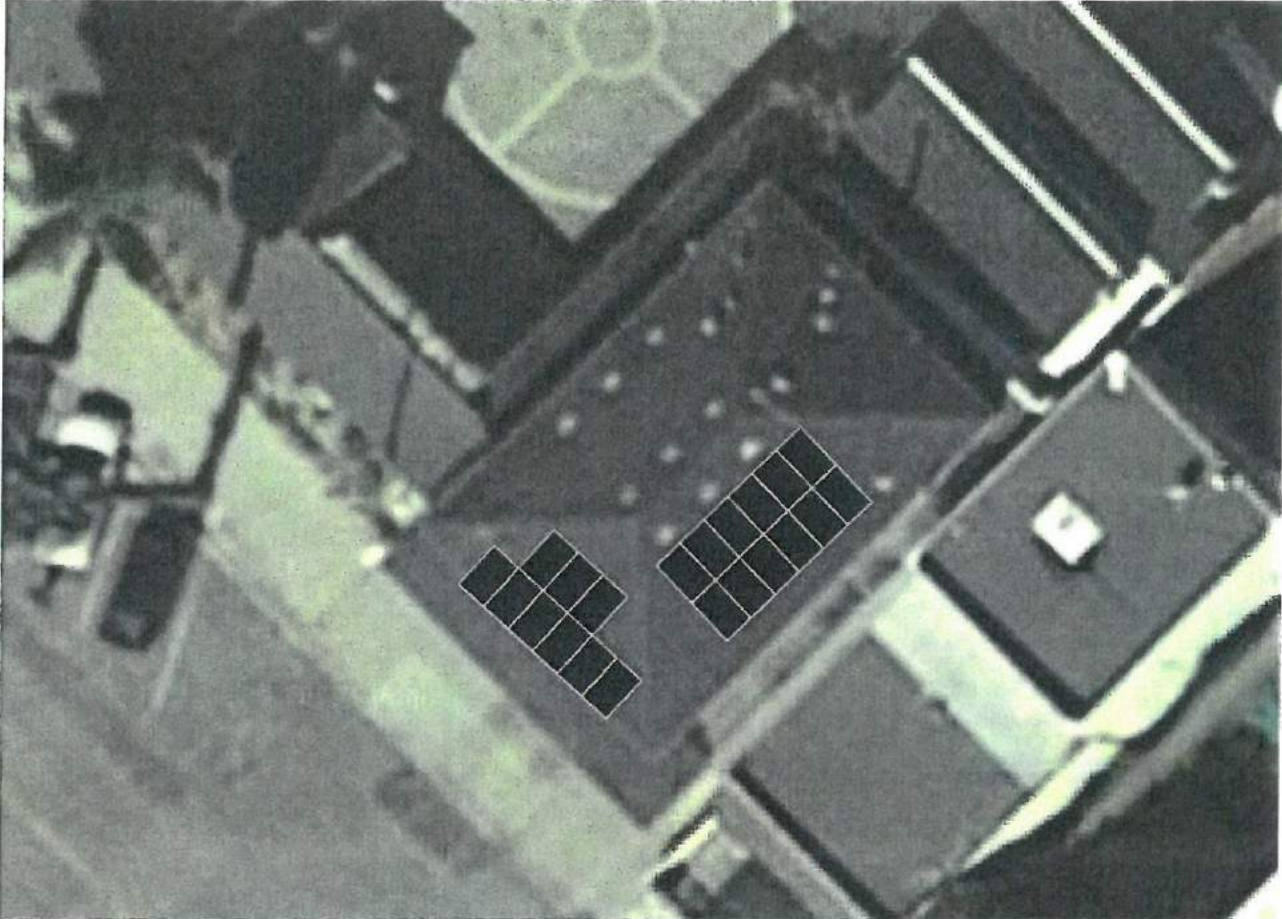
Home Value Increase refers to the amount you can expect to recoup from the investment if you were able to sell your property and is based on the following study: An Analysis of the Effects of Residential Photovoltaic Energy Systems on Home Sales Prices in California, Lawrence Berkeley National Laboratory, April 2011.

The Internal Rate of Return of an investment is the interest rate at which the net present value of the project's cost equals the net present value of the project's benefits.

Payback Period refers to the period of time required for the benefits of an investment to "repay" the sum of the original investment.



Preliminary PV Array Layout



Sales Consultant



James Allen

Phone: (831) 334-0696

Email: james@allterraenv.com

Proposal Date: November 28, 2017 | Santa Cruz City - La Selva Beach Library Project | SN#8402, Solution A

This proposal is valid for 30 days from the proposal date.

Preliminary System Bill of Materials

Manufacturer	Product	Description	Qty	Unit
Enphase Energy	IQ6PLUS-72-2-US (240Vac)	290VA 240Vac microinverter for 60 and 72 cell modules	21.00	each
LG Electronics	LG335N1C-A5	335W 60 cell Monocrystalline module with Cello technology	21.00	each
Allterra Solar	Labor & BOS	All labor & balance of materials	1	-



System Details

Solar PV System | Your Custom Design

Our team prepared a solar design for your business. Design specifications are shown below. All systems include monitoring.

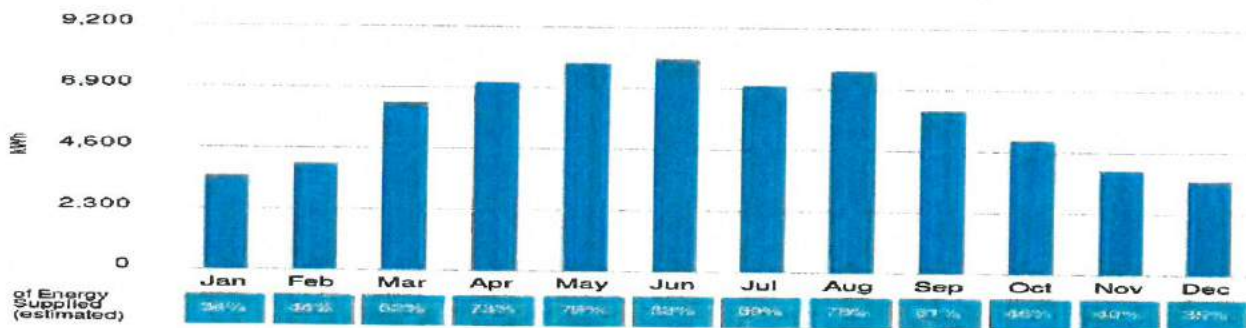
System Size: 48.575 DC kW (STC)
 Number of Panels: 145
 Solar Panel Type: LG Electronics LG335N1C-A5
 Inverter Type: 3 SolarEdge Technologies SE14.4KUS

Solar Power Production | How much electricity will my system generate?

Solar will generate electricity and PG&E will credit your account based on how many kilowatt-hours (kWh) the system produces. Solar power production estimates are shown below.

Year 1 Production: **70,626 kWh** PG&E Usage Offset: **58 %**

Solar Electricity Generated (estimated)



PG&E Bill Offset | What will my PG&E bill be after the solar is up and running?

Solar will provide most of the power for your facility and reduce your PG&E bill. Our estimates are shown below.

Last Year's PG&E Bill	Next Year's PG&E Bill
\$28,151	\$11,329

PG&E Bill Offset:	60 %
Year 1 Savings:	\$16,822
25-Year Savings:	\$839,994

Your Current Cost Per kWh: **\$0.23 / kWh**



Return On Investment

Solar Proposal | How much does the system cost?

Allterra always keeps an eye out for new technology so you can be sure you are getting the best equipment at a competitive price. The system cost includes all permitting, solar equipment, warranties, monitoring, and labor for design and installation. Allterra installs a turnkey solar PV system and provides all the logistical support needed to get your solar power plant up and running.

Total Amount	\$189,750.00	Average Price for Solar Electricity \$0.14 / kWh
Less Federal Tax Credit:	(\$0.00)	
Less MACRs Depreciation (year 1):	(\$0.00)	
Net Project Price (year 1)	\$189,750.00	

Return On Investment | There are lots of reasons to go solar.



Your Financial Benefits

Internal Rate of Return (IRR):	12.47 %
Payback Period (Years):	9.1 yrs
25-yr Project Savings:	\$650,244
Net Present Value (NPV):	\$445,056.69



You will offset these harmful greenhouse gases

CO ₂ Reductions	78112.36 lbs/yr
NO _x Reductions	26.77 lbs/yr
SO ₂ Reductions	12.78 lbs/yr

Commercial Cash Flow Table – Cash Purchase

This table of estimated cash flows includes any tax effects, rate and cost inflation and other time-related cash-flow factors as detailed in Assumptions and Definitions.

Cash Flow Summary	Estimated Utility Bill w/o Project	Estimated Utility Bill with Project	Customer Payments ¹	Estimated Net Savings	Estimated Cumulative Savings
Upfront			(\$189,750)	(\$189,750)	(\$189,750)
Year 1	(\$28,151)	(\$11,329)		\$16,822	(\$172,928)
Year 2	(\$29,699)	(\$11,982)		\$17,718	(\$155,210)
Year 3	(\$31,333)	(\$12,672)		\$18,661	(\$136,549)
Year 4	(\$33,056)	(\$13,402)		\$19,654	(\$116,895)
Year 5	(\$34,874)	(\$14,173)		\$20,701	(\$96,194)
Year 6	(\$36,792)	(\$14,989)		\$21,803	(\$74,391)
Year 7	(\$38,816)	(\$15,851)		\$22,964	(\$51,427)
Year 8	(\$40,951)	(\$16,763)		\$24,187	(\$27,239)
Year 9	(\$43,203)	(\$17,727)		\$25,476	(\$1,764)
Year 10	(\$45,579)	(\$18,747)		\$26,832	\$25,069
Year 11	(\$48,086)	(\$19,824)		\$28,262	\$53,330
Year 12	(\$50,731)	(\$20,963)		\$29,767	\$83,097
Year 13	(\$53,521)	(\$22,168)		\$31,353	\$114,451
Year 14	(\$56,464)	(\$23,441)		\$33,024	\$147,474
Year 15	(\$59,570)	(\$24,786)		\$34,784	\$182,258
Year 16	(\$62,846)	(\$26,209)		\$36,637	\$218,895
Year 17	(\$66,303)	(\$27,713)		\$38,589	\$257,484
Year 18	(\$69,949)	(\$29,303)		\$40,646	\$298,130
Year 19	(\$73,796)	(\$30,984)		\$42,813	\$340,943
Year 20	(\$77,855)	(\$32,761)		\$45,095	\$386,038
Year 21	(\$82,137)	(\$34,639)		\$47,499	\$433,536
Year 22	(\$86,655)	(\$36,624)		\$50,031	\$483,568
Year 23	(\$91,421)	(\$38,722)		\$52,699	\$536,266
Year 24	(\$96,449)	(\$40,940)		\$55,509	\$591,775
Year 25	(\$101,754)	(\$43,285)		\$58,469	\$650,244

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

Annual Electricity Inflation Rate: 5.5 %

Discount Rate: 2.0 %

Annual Electricity Inflation Rate is the assumed rate (%) of electricity cost inflation per year and is based on the historical averages for PG&E.

The Discount Rate lowers the value of future cashflows.

Home Value Increase refers to the amount you can expect to recoup from the investment if you were able to sell your property and is based on the following study: An Analysis of the Effects of Residential Photovoltaic Energy Systems on Home Sales Prices in California, Lawrence Berkeley National Laboratory, April 2011.

The Internal Rate of Return of an investment is the interest rate at which the net present value of the project's cost equals the net present value of the project's benefits.

Payback Period refers to the period of time required for the benefits of an investment to "repay" the sum of the original investment.



Preliminary PV Array Layout



Sales Consultant



James Allen

Phone: (831) 334-0696

Email: james@allterraenv.com

Proposal Date: November 28, 2017|Santa Cruz City - Live Oak Library Project|SN#8403, Solution A

This proposal is valid for 30 days from the proposal date.

Preliminary System Bill of Materials

Manufacturer	Product	Description	Qty	Unit
SolarEdge Technologies	SE14.4KUS	Three-phase 208V string inverter	3.00	each
SolarEdge Technologies	P700	Module Add-On for 2 x 72 cell modules and three phase SE inverters. For Commercial Installations for North America.	73.00	each
LG Electronics	LG335N1C-A5	335W 60 cell Monocrystalline module with Cello technology	145.00	each
Allterra Solar	Labor & BOS	All labor & balance of materials	1	-



System Details

Solar PV System | Your Custom Design

Our team prepared a solar design for your business. Design specifications are shown below. All systems include monitoring.

System Size: 64.655 DC kW (STC)
 Number of Panels: 193
 Solar Panel Type: LG Electronics LG335N1C-A5
 Inverter Type: 4 SolarEdge Technologies SE14.4KUS

Solar Power Production | How much electricity will my system generate?

Solar will generate electricity and PG&E will credit your account based on how many kilowatt-hours (kwh) the system produces. Solar power production estimates are shown below.

Year 1 Production: **100,690 kWh** PG&E Usage Offset: **98 %**

Solar Electricity Generated (estimated)



PG&E Bill Offset | What will my PG&E bill be after the solar is up and running?

Solar will provide most of the power for your facility and reduce your PG&E bill. Our estimates are shown below.

Last Year's PG&E Bill	Next Year's PG&E Bill
\$24,980	\$2,805

PG&E Bill Offset:	89 %
Year 1 Savings:	\$22,175
25-Year Savings:	\$766,165

Your Current Cost Per kWh: **\$0.24 / kWh**



Return On Investment

Solar Proposal | How much does the system cost?

Allterra always keeps an eye out for new technology so you can be sure you are getting the best equipment at a competitive price. The system cost includes all permitting, solar equipment, warranties, monitoring, and labor for design and installation. Allterra installs a turnkey solar PV system and provides all the logistical support needed to get your solar power plant up and running.

Total Amount	\$251,900.00	Average Price for Solar Electricity \$0.13 / kWh
Less Federal Tax Credit:	(\$0.00)	
Less MACRs Depreciation (year 1):	(\$0.00)	
Net Project Price (year 1)	\$251,900.00	

Return On Investment | There are lots of reasons to go solar.

Financial ROI

Your Financial Benefits

Internal Rate of Return (IRR):	9.77 %
Payback Period (Years):	10.1 yrs
25-yr Project Savings:	\$514,265
Net Present Value (NPV):	\$342,592.51

Environmental ROI

You will offset these harmful greenhouse gases

CO ₂ Reductions	111363.14 lbs/yr
NO _x Reductions	38.16 lbs/yr
SO ₂ Reductions	18.22 lbs/yr

Commercial Cash Flow Table – Cash Purchase

This table of estimated cash flows includes any tax effects, rate and cost inflation and other time-related cash-flow factors as detailed in Assumptions and Definitions.

Cash Flow Summary	Estimated Utility Bill w/o Project	Estimated Utility Bill with Project	Customer Payments ¹	Estimated Net Savings	Estimated Cumulative Savings
Upfront			(\$251,900)	(\$251,900)	(\$251,900)
Year 1	(\$24,980)	(\$2,805)		\$22,176	(\$229,724)
Year 2	(\$25,730)	(\$2,980)		\$22,749	(\$206,975)
Year 3	(\$26,502)	(\$3,163)		\$23,338	(\$183,637)
Year 4	(\$27,297)	(\$3,354)		\$23,942	(\$159,694)
Year 5	(\$28,116)	(\$3,554)		\$24,562	(\$135,133)
Year 6	(\$28,959)	(\$3,761)		\$25,198	(\$109,935)
Year 7	(\$29,828)	(\$3,978)		\$25,850	(\$84,085)
Year 8	(\$30,723)	(\$4,204)		\$26,519	(\$57,566)
Year 9	(\$31,644)	(\$4,439)		\$27,205	(\$30,361)
Year 10	(\$32,594)	(\$4,685)		\$27,909	(\$2,452)
Year 11	(\$33,572)	(\$4,940)		\$28,632	\$26,179
Year 12	(\$34,579)	(\$5,206)		\$29,372	\$55,552
Year 13	(\$35,616)	(\$5,484)		\$30,133	\$85,684
Year 14	(\$36,685)	(\$5,772)		\$30,912	\$116,597
Year 15	(\$37,785)	(\$6,073)		\$31,712	\$148,309
Year 16	(\$38,919)	(\$6,386)		\$32,533	\$180,842
Year 17	(\$40,086)	(\$6,711)		\$33,375	\$214,217
Year 18	(\$41,289)	(\$7,050)		\$34,239	\$248,456
Year 19	(\$42,527)	(\$7,403)		\$35,125	\$283,581
Year 20	(\$43,803)	(\$7,769)		\$36,034	\$319,615
Year 21	(\$45,117)	(\$8,151)		\$36,966	\$356,581
Year 22	(\$46,471)	(\$8,548)		\$37,923	\$394,504
Year 23	(\$47,865)	(\$8,960)		\$38,905	\$433,409
Year 24	(\$49,301)	(\$9,389)		\$39,911	\$473,320
Year 25	(\$50,780)	(\$9,836)		\$40,944	\$514,265

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

Annual Electricity Inflation Rate: 3.0 %

Discount Rate: 2.0 %

Annual Electricity Inflation Rate is the assumed rate (%) of electricity cost inflation per year and is based on the historical averages for PG&E.

The Discount Rate lowers the value of future cashflows.

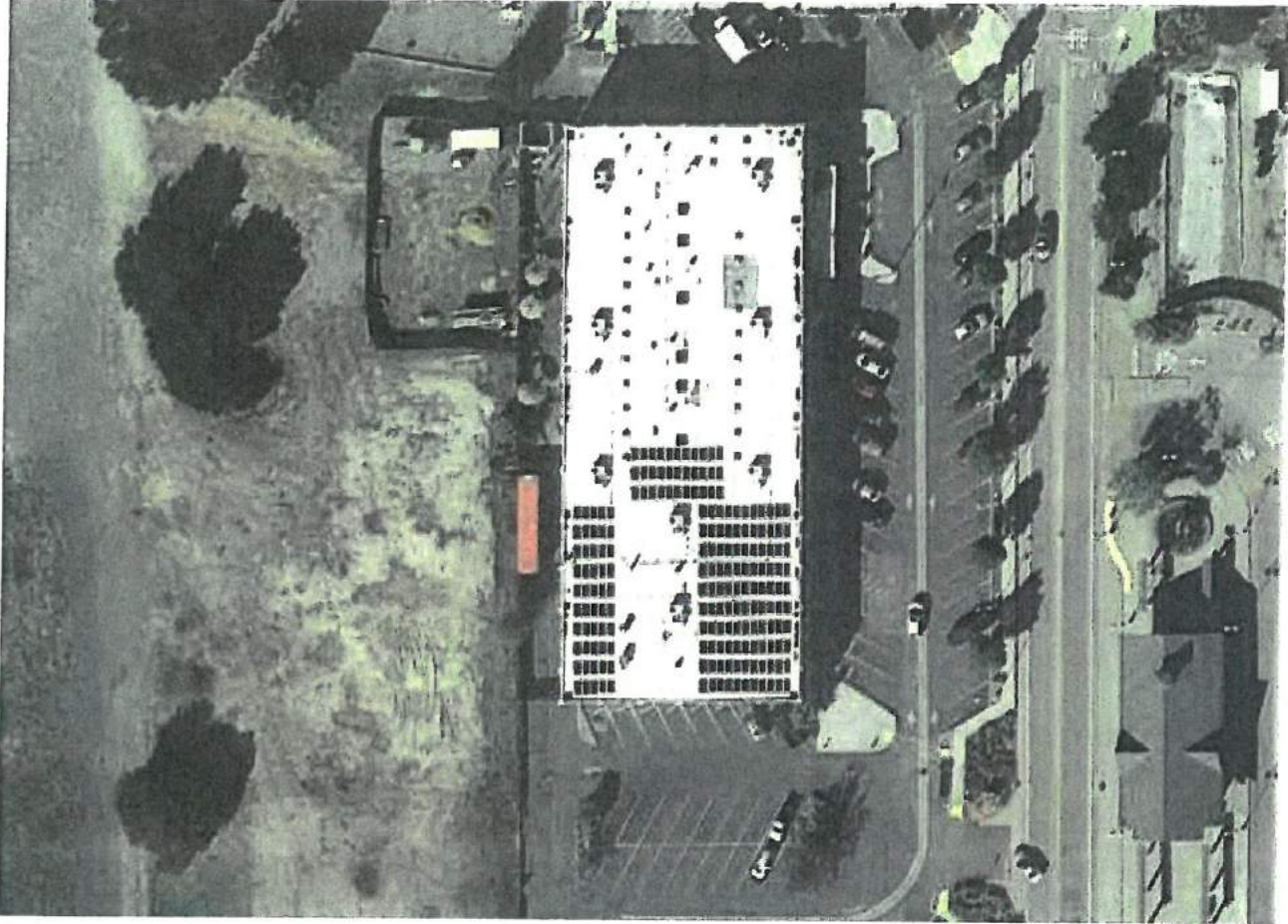
Home Value Increase refers to the amount you can expect to recoup from the investment if you were able to sell your property and is based on the following study: An Analysis of the Effects of Residential Photovoltaic Energy Systems on Home Sales Prices in California, Lawrence Berkeley National Laboratory, April 2011.

The Internal Rate of Return of an investment is the interest rate at which the net present value of the project's cost equals the net present value of the project's benefits.

Payback Period refers to the period of time required for the benefits of an investment to "repay" the sum of the original investment.



Preliminary PV Array Layout



Sales Consultant



James Allen

Phone: (831) 334-0696

Email: james@allterraenv.com

Proposal Date: November 28, 2017|Santa Cruz City - Scotts Valley Library Project|SN#8404, Solution A

This proposal is valid for 30 days from the proposal date.

Preliminary System Bill of Materials

Manufacturer	Product	Description	Qty	Unit
SolarEdge Technologies	SE14.4KUS	Three-phase 208V string inverter	4.00	each
SolarEdge Technologies	P700	Module Add-On for 2 x 72 cell modules and three phase SE inverters. For Commercial Installations for North America.	97.00	each
LG Electronics	LG335N1C-A5	335W 60 cell Monocrystalline module with Cello technology	193.00	each
Allterra Solar	Labor & BOS	All labor & balance of materials	1	-

