

The Amaryllis Project



Prepared by Ryan Pace Sloan
For Hawaiian Senator Brian Schatz

The Amaryllis Project

The project is to take in federal funds intended for investment into the Hawaiian Energy Sector (USDA High Energy Cost Grant) and utilize them to achieve the goal of lowering costs for Hawaiian Businesses.

If I were awarded a grant, I would approach a business directly, offer to build a solar system on their property and sell them the electricity 35% below the market rate. That means they would pay \$0.24 instead of the market \$0.37. At usage of 515 kWh monthly that would save a business \$66.76 a month, bringing its annual bill down \$802.16 from \$2285.36 to \$1483.20.

State	Number of Customers	Average Monthly Consumption (kWh)	Average Price (cents/kWh)	Average Monthly Bill (\$)
Hawaii	422,386	515	36.98	190.36

Figure 1.1 Source: http://www.eia.gov/electricity/sales_revenue_price/xls/table5_a.xls

This strategy is effective as it targets businesses directly and delivers power less expensively.

The approach I would like to take to this is to acquire the funding to perform one complete assessment and installation at a Hawaiian business, and if the process proves successful then be granted more funding on a need by need basis up to the limit set by the USDA.

The estimated system size would be 15 kW which would produce around 20,000 kWh to sustain a business that uses 3 times more than then average consumption of power. The price to build the system would be \$56,250 (\$3.75/W).

Supporting the Amaryllis project, the USDA would invest \$56,250 and a Hawaiian business's energy price would go down \$0.13. They would save \$24,600 over 10 years. That's a 42% return on investment. The entire grant amount of \$3,000,000 would support doing this fifty times over. That's a total savings of \$1,303,800 for businesses in Hawaii.

I am asking for your support in the form of a letter signed by Senator Schatz expressing his support for the project. I would submit the letter with my application for the US Department of Agriculture High Energy Cost Grant as a showing of community support. For additional information on the project feel free to contact me.

Best,

Ryan Pace Sloan

Director

The Amaryllis Project

See the last page of this document for contact information

Sample Letter:

To Whom It May Concern,

I, Congressman Brian Schatz, was approached by Ryan Pace Sloan regarding his desire to lower energy costs in Hawaii using a USDA Federal Grant. He briefly explained his mission and his strategy to address high energy costs using that money. I support him in his pursuit of the grant. His vision for energy and his mission are in line with the State of Hawaii's and we welcome someone who wants to come and help our community.

Sincerely,

Senator Signs Here

Please use the Senator's Official Stationary for the letter.

For a digital version of this sample letter type into any browser: www.ryanpacesloan.com/Senator/Schatz.html

The Amaryllis Project

Projected Average Customer Savings

State	Number of Customers	Avg Monthly Consumption (kWh)	Avg Price (cents/kWh)	Avg Monthly Bill (\$)
Hawaii	422,386	515	36.98	190.36

Source: http://www.eia.gov/electricity/sales_revenue_price/xls/table5_a.xls

Per Customer

Avg Annual Consumption (kWh)	6180
Annual Bill @ Avg Market Price	\$2,285.36
Annual Bill @ Amaryllis Rate	\$1,483.20
Avg Annual Customer Savings	\$802.16
Savings over 10 Years	\$8,021.64
Monthly Bill @ Amaryllis Rate	\$123.60
Monthly Savings	\$66.76

Rate Structure (\$/kWh)

Year 1 -7	\$0.24
Year 8-14	\$0.25
Year 9-21	\$0.26
Year 22-28	\$0.27
Year 29+	\$0.28

*Rate must go up to offset increasing system inefficiency and growing costliness over time

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Projected Costs Per System

Example PV System to be installed on site:

Construction costs (\$/W)	\$3.75
Total Watts (W)	15,000
Total Construction Cost (\$)	\$56,250.00

Average Annual Generation (W)	18,985.15
<small>*Averaged Over 10 Years - See Projected Performance Analysis</small>	
Energy Value at Amaryllis Price @ \$0.24 kWh	\$4,556.44
Annual Rate of Return on USDA Investment	8.10%

Market Value @ \$0.37 kWh	\$7,024.51
Total Amount Saved by Customer	\$2,468.07

Average Annual Operation Expense (@ Cost of \$0.12/W)	\$2,559.47
<small>*See Projected Performance Analysis</small>	
Insurance (@ Annually - 0.50% of Total Value)	\$281.25
Property Tax (@\$10.05 per \$1000 of Equipment Value)	\$565.31
<small>*Federal and State Tax subject to Incentives</small>	
Average Annual Expenses Total	\$3,406.03

Total Annual Profit	\$1,150.41
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The Amaryllis Project - Projected Performance Analysis

System Size: 15 kW

Production Source Data: pvwatts.nrel.gov

	Year 1	Year 2	Year 3	Year 4	Year 5	
% Efficiency	96%	95.50%	95%	94.50%	94%	
Total Annual Production MWh	20.16	19.26	19.16	19.06	18.95	
Total Annual Production kWh	20,164.80	19,257.38	19,156.56	19,055.73	18,954.91	
Customer Price	\$0.240	\$0.240	\$0.240	\$0.240	\$0.240	
Total Annual Customer Sales	\$4,839.55	\$4,621.77	\$4,597.57	\$4,573.38	\$4,549.18	\$23,181.45
Annual Operation Expense	\$2,419.78	\$2,310.89	\$2,298.79	\$2,286.69	\$2,274.59	
Insurance	\$281.25	\$281.25	\$281.25	\$281.25	\$281.25	
Total Annual Costs	\$2,701.03	\$2,592.14	\$2,580.04	\$2,567.94	\$2,555.84	\$12,996.97
Gross Profit	\$2,138.53	\$2,029.64	\$2,017.54	\$2,005.44	\$1,993.34	\$10,184.47
Federal Tax	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	
State Tax	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	
Property Tax Equipment	\$565.31	\$565.31	\$565.31	\$565.31	\$565.31	
Total Taxes	\$565.31	\$565.31	\$565.31	\$565.31	\$565.31	\$2,826.56
Total Annual Profit	\$1,573.21	\$1,464.32	\$1,452.22	\$1,440.13	\$1,428.03	\$7,357.91

Year 1 Year 2 Year 3 Year 4 Year 5

Total Saved \$12,556.62
(5 year total production @ \$0.13)

Rate of Return 13.1%
(over 5 years)

The Amaryllis Project - Projected Performance Analysis

System Size: 15 kW

Production Source Data: pvwatts.nrel.gov

	Year 6	Year 7	Year 8	Year 9	Year 10	
% Efficiency	93.50%	93%	92.50%	92%	91.50%	
Total Annual Production MWh	18.85	18.75	18.65	18.55	18.45	
Total Annual Production kWh	18,854.08	18,753.26	18,652.44	18,551.61	18,450.79	
Customer Price	\$0.240	\$0.240	\$0.250	\$0.250	\$0.250	
Total Annual Customer Sales	\$4,524.98	\$4,500.78	\$4,663.11	\$4,637.90	\$4,612.70	\$46,120.92
Annual Operation Expense	\$2,262.49	\$2,250.39	\$2,238.29	\$2,226.19	\$2,214.09	
Insurance	\$281.25	\$281.25	\$281.25	\$281.25	\$281.25	
Total Annual Costs	\$2,543.74	\$2,531.64	\$2,519.54	\$2,507.44	\$2,495.34	\$25,594.69
Gross Profit	\$1,981.24	\$1,969.14	\$2,143.57	\$2,130.46	\$2,117.35	\$20,526.23
Federal Tax	\$0.00	\$0.00	\$535.89	\$532.61	\$529.34	\$1,597.84
State Tax	\$0.00	\$0.00	\$214.36	\$213.05	\$211.74	\$639.14
Property Tax Equipment	\$565.31	\$565.31	\$565.31	\$565.31	\$565.31	\$5,653.13
Total Taxes	\$565.31	\$565.31	\$1,315.56	\$1,310.97	\$1,306.39	\$7,890.11
Total Annual Profit	\$1,415.93	\$1,403.83	\$828.01	\$819.49	\$810.97	\$12,636.13
	Year 6	Year 7	Year 8	Year 9	Year 10	

Total Saved \$12,124.08
(5 year total production @ \$0.12)

Rate of Return 9.38%
(over 5 years)

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Solar Radiation Profile for the Island of Hawaii

Production Source Data: pvwatts.nrel.gov

PVWatts: Monthly PV Performance Data

Location:

HILO, HI

DC System Size (kW):

15

Average Cost of Electricity Purchased from Utility (\$/kWh):

\$0.41

Initial Cost (\$/W)

\$2.60

Cost of Electricity Generated by System (\$/kWh):

\$0.12

Month	AC System Output(kWh)	Value (\$)
1	1,551.75	\$640.87
2	1,628.55	\$672.59
3	1,766.96	\$729.76
4	1,683.47	\$695.27
5	1,744.58	\$720.51
6	1,805.81	\$745.80
7	1,745.10	\$720.73
8	1,848.50	\$763.43
9	1,772.57	\$732.07
10	1,625.95	\$671.52
11	1,455.41	\$601.08
12	1,536.13	\$634.42
Total	20,164.80	\$8,328.05

Module Type:

Standard

Array Type:

Fixed (open rack)

Array Tilt (deg):

18

Array Azimuth (deg):

180

System Losses:

14%

Invert Efficiency:

96%

DC to AC Size Ratio:

1.1

The Amaryllis Project

Contact Information

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Director

Amaryllis Project

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