



**Disclaimer:** The information provided in this spreadsheet should NOT be considered legal, financial or engineering advice.

Proper legal counsel, along with financial and tax guidance, is required to definitively determine the financial ramification of installing a specific solar hot water heating system.

This information is provided as a public service by Pelican Solar. Pelican Solar is not liable for decisions made based on this material.

Residents and Business are able to fully use Federal Tax Benefits in the year they are earned

Swimming pools not eligible for Federal Tax Credit.

Loan interest payment tax benefits are only determined for commercial businesses

**Enter Inputs in Shaded Cells**

\* Information provided by customer

**System Cost and Performance**

Square Feet of Collectors	800
Solar Orientation Factor	1.00
Shading Factor	1.00
Installed Cost, \$ per square foot	\$ 125.00
Annual Output, therms per square foot	2.02
System Total Cost (\$)	\$ 100,000
System Annual Output (Therms/yr)	1,615
System Cost (\$/Therm)	\$ 61.93

> 2.0 for very efficient, 1.5 or less for sub-optimal conditions

**System Ownership**

What is the system's ownership (in CAPS)?	C	C = Commercial or Residential, N = Non-Profit or Local Government
Is it a residential system (in CAPS)?	N	Enter "Y" for Yes or "N" for No

**Business Tax Rates**

Business Federal Income Tax Rate	35.00%	0% for non profits and governments
Business State Income Tax Rate	8.84%	0% for non profits and governments

**California Solar Initiative**

Project located in CSI eligible region (Utility district)	N	Enter "Y" for Yes or "N" for No
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**CEC Cash for Appliance Program**

Does system meet requirements?	N	Enter "Y" for Yes or "N" for No
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## Type of Hotwater Heater

Fuel Used  Enter "N" for natural gas, "P" for propane or "E" for electricity then complete the appropriate section for that fuel type

### **Natural Gas Cost**

Year One Natural Gas Price (\$/therm)   
 Natural Gas Inflation Rate (%/yr)  growth rate between 2000 and 2005, 7.8%/year  
 Water Heater Combustion Efficiency (%)

### **Propane Cost**

Year One Propane Price (\$/gallon)   
 Propane Inflation Rate (%/yr)  growth rate between 2000 and 2005, 7%/year  
 Water Heater Combustion Efficiency (%)

### **Electricity Cost**

Year One Electricity Price (\$/kWh)   
 Electricity Inflation Rate (%/yr)  growth rate between 2000 and 2005, 4.9%/year  
 Water Heater Combustion Efficiency (%)

## Operation and Maintenance Costs

O&M Cost (% of installed cost/yr)   
 O&M Inflation Rate (%/yr)

## Federal Investment Tax Credit & Depreciation

Federal Tax Credit (%)  ( 0% for swimming pool)  
 Federal Tax Credit (\$)   
 System Cost After Fed Tax Credit (\$)   
 Basis for Federal Depreciation   
 Depreciation Schedule  Enter "1", "5", Or "7"  
 1 = 100% year one depreciation, using section 179 depreciation, limited to \$250,000 in 2010  
 5 = Five year accelerated depreciation  
 7 = Seven year depreciation for solar thermal pool heating systems

## CSI Incentive Calc.

(SRCC OG-300 estimated annual therm savings) X (\$12.82) X (SOF) X (SHADE FACTOR) = \$ Incentive Amount

max therms (less than or equal to)

Incentive Level breaks	Period 1	Period 2	Period 3	Period 4
Residential	\$12.82	\$10.26	\$7.69	\$4.70 \$/therm
Commercial	\$12.82	\$10.26	\$7.69	\$4.70 \$/therm

Incentive Rate:  Corresponding period dollar amount  
 Incentive \$/Therm

### **Estimated utility rebate**

	Period 1	Period 2	Period 3	Period 4
Residential	\$ 1,876	\$ 1,500	\$ 1,125	\$ 688
Commercial	\$ 500,000	\$ 500,000	\$ 500,000	\$ 500,000
This Owner	\$ 500,000	\$ 500,000	\$ 500,000	\$ 500,000

This system

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**Special Loans (e.g., shared savings)**

Loan % of total cost (%)	0%	of total system cost
Loan Amount (\$)	\$ -	
Term (yr)	5	max 20 years
Annual Interest Rate (%)	3.0%	

**Bank Loan**

Loan % of total cost (%)	0%	of total system cost
Loan Amount (\$)	\$ -	
Term (yr)	15	max 20 years
Annual Interest Rate (%)	8.0%	

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**CA incentives**

CSI Incentive	\$ 20,700
Cash for Appliance	FALSE
Total Incentives	\$ 20,700
System Cost After Incentives (\$)	\$ 79,300

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**Discount Rate Assumption**

Discount rate for NPV calculations	7.5%
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**Carbon Dioxide Emission Reduction**

Fuel type reduced	Natural Gas
Pounds Carbon Dioxide reduced per year	18,988 Lbs CO2/year
Pounds Carbon Dioxide over 20 years	379,764

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System Cost After Focus and WE Incentives (\$)

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**Years to cost payback (non discounted)**

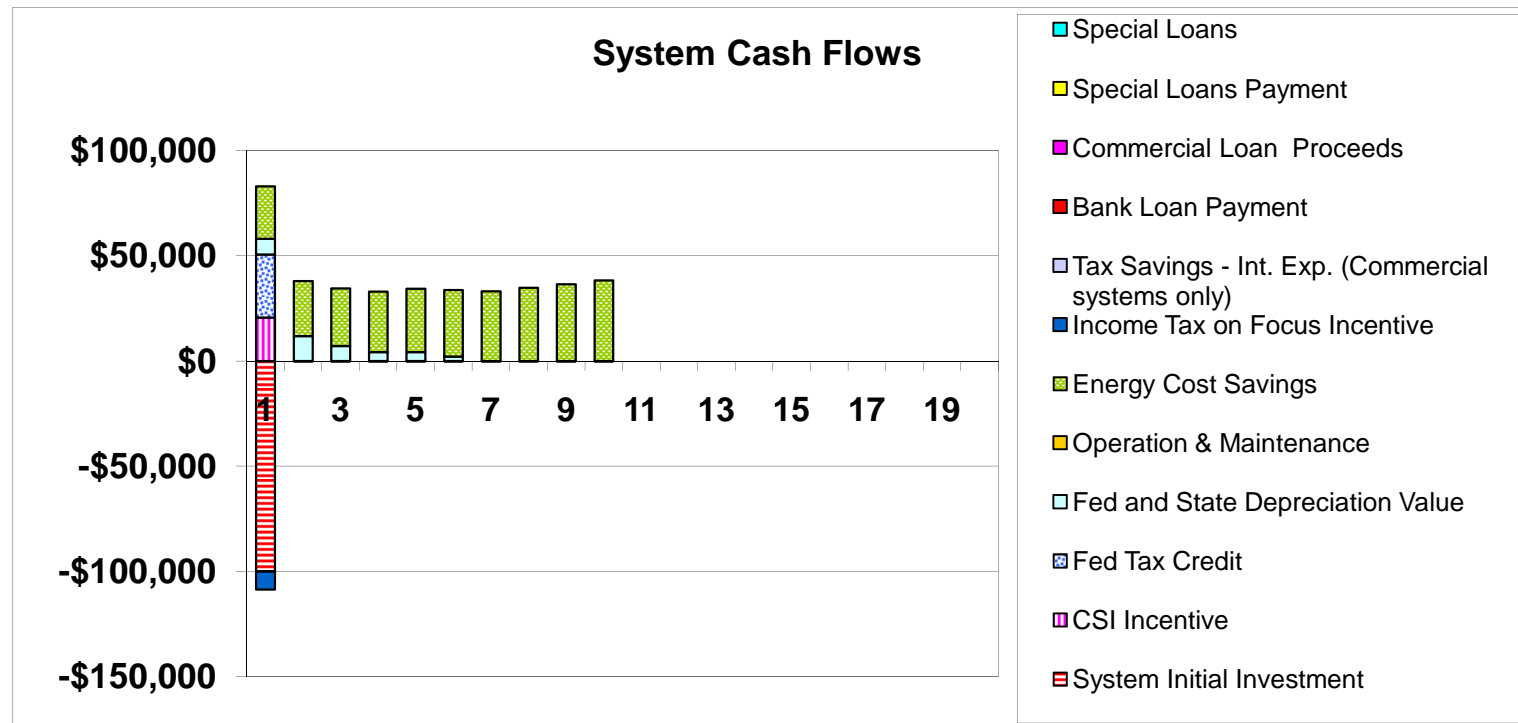
6

**Internal Rate of Return**

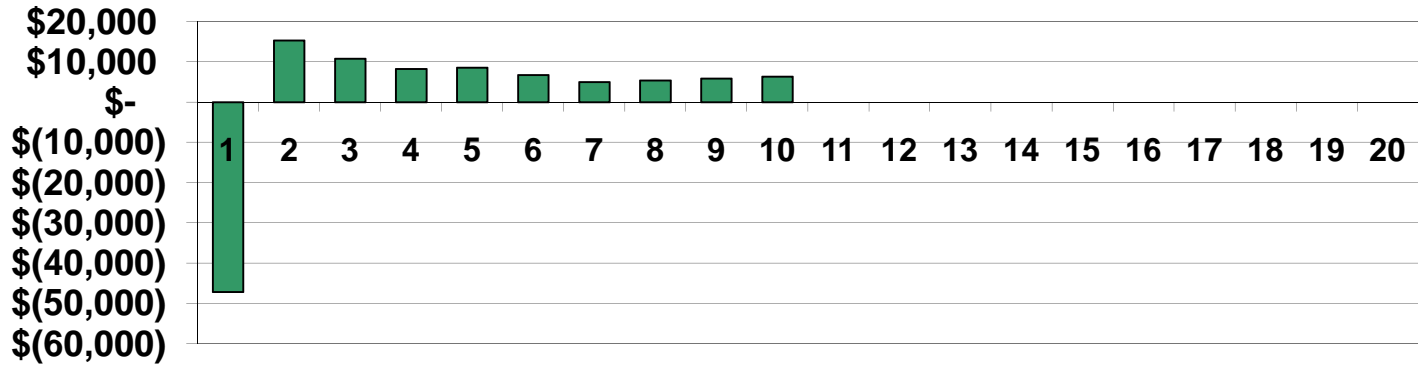
10 Year IRR	12%	\$ 37,264
20 Year IRR	12%	
25 Year IRR	12%	
30 Year IRR	12%	

**Present Value**

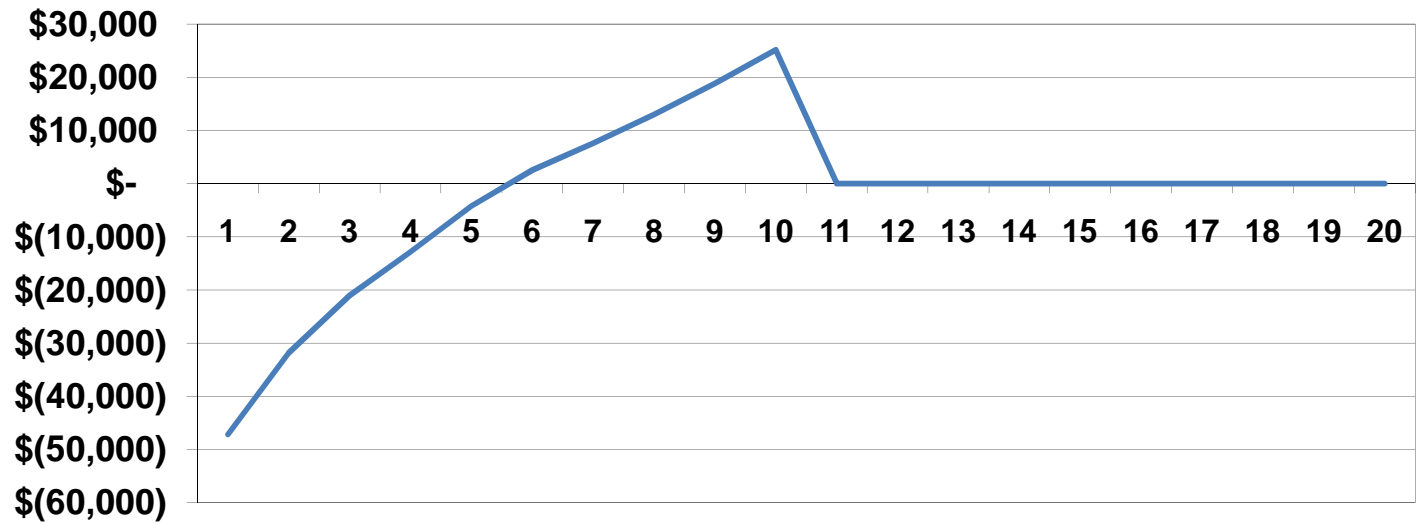
10 Year NPV @ above Discount Rate	\$6,803
20 Year NPV @ above Discount Rate	\$6,803
25 Year NPV @ above Discount Rate	\$6,803
30 Year NPV @ above Discount Rate	\$6,803



### Annual Cash Flow



### Cumulative Cash Flow



		1	2	3	4	5	6	7	8	9	10
N	Natural Gas Savings	\$ 3,229	\$ 3,488	\$ 3,767	\$ 4,068	\$ 4,393	\$ 4,745	\$ 5,124	\$ 5,534	\$ 5,977	\$ 6,455
P	Propane Savings	\$ 10,143	\$ 10,853	\$ 11,613	\$ 12,426	\$ 13,296	\$ 14,226	\$ 15,222	\$ 16,288	\$ 17,428	\$ 18,648
E	Electricity Savings	\$ 9,564	\$ 10,033	\$ 10,524	\$ 11,040	\$ 11,581	\$ 12,148	\$ 12,743	\$ 13,368	\$ 14,023	\$ 14,710
		11	12	13	14	15	16	17	18	19	20
N	Natural Gas Savings	\$ 6,972	\$ 7,530	\$ 8,132	\$ 8,782	\$ 9,485	\$ 10,244	\$ 11,063	\$ 11,948	\$ 12,904	\$ 13,937
P	Propane Savings	\$ 19,953	\$ 21,350	\$ 22,844	\$ 24,444	\$ 26,155	\$ 27,985	\$ 29,944	\$ 32,040	\$ 34,283	\$ 36,683
E	Electricity Savings	\$ 15,431	\$ 16,187	\$ 16,980	\$ 17,812	\$ 18,685	\$ 19,601	\$ 20,561	\$ 21,568	\$ 22,625	\$ 23,734
		21	22	23	24	25	26	27	28	29	30
N	Natural Gas Savings	\$ 15,052	\$ 16,256	\$ 17,556	\$ 18,961	\$ 20,477	\$ 22,116	\$ 23,885	\$ 25,796	\$ 27,859	\$ 30,088
P	Propane Savings	\$ 39,251	\$ 41,998	\$ 44,938	\$ 48,084	\$ 51,450	\$ 55,051	\$ 58,905	\$ 63,028	\$ 67,440	\$ 72,161
E	Electricity Savings	\$ 24,897	\$ 26,117	\$ 27,397	\$ 28,739	\$ 30,147	\$ 31,624	\$ 33,174	\$ 34,800	\$ 36,505	\$ 38,293

conversion factors used (above)  
propane  
electricity

1.047 gallons propane/therm  
29.32 kWh/therm

Emission Factors for Carbon Dioxide

Natural Gas  
Electricity  
Propane

source units	conversion to lbs/therm	source
11.76 lbs/therm	11.76	<a href="http://www.doa.state.wi.us/docview.asp?docid=2404">http://www.doa.state.wi.us/docview.asp?docid=2404</a>
2.216 lbs/kWh	64.97	<a href="http://www.doa.state.wi.us/docview.asp?docid=2404">http://www.doa.state.wi.us/docview.asp?docid=2404</a>
0.1383 lbs/kBtu	13.83	

[http://www.energystar.gov/ia/business/evaluate\\_performance/Emissions\\_Supporting\\_Doc.pdf](http://www.energystar.gov/ia/business/evaluate_performance/Emissions_Supporting_Doc.pdf)

for selected fuel

11.76