



Fagen Friedman & Fulfroft LLP

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# California Green Summit

## Accelerating the Learning Curve

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Fagen Friedman & Fulfroft LLP

## ACCELERATING THE LEARNING CURVE: FINANCING OPTIONS FOR RENEWABLES

**Introduction:** There are a number of ways in which to finance the acquisition of solar facilities and solar power. If properly managed, all of the financing methods should save your business or school district significant amounts of money as opposed to simply paying your existing energy bill over time. The alternative that is best for your business or school district will depend on the unique circumstances of your operations and financial resources.

For this reason you are encouraged to analyze more than one financing option and more than one solar facility so that you may compare them. You are also encouraged to have your efforts aided by an expert. The following are general factors to consider as you weigh each method.

**1. Straight Purchase of the Solar Facility:** Under this option, the district or business simply purchases the equipment.

Advantages: Potential considerable savings in that energy cost savings are compounded by the absence of financing costs. Districts will also avoid the challenges of coordinating operations and construction of district property with vendor work crews.

Disadvantages: The main disadvantage and an "option killer" for most businesses and districts contemplating the purchase option, is the significant upfront costs of purchasing solar facilities, which can be several million dollars or more for larger systems. Coming up with this amount from general funds or a budget may be impossible, especially in this fiscal environment. The other challenge is that you will have to have the facility constructed and maintained. Production "guarantees" from a manufacturer will be much less effective than a "guarantee" from a Power Provider. As a result, your due diligence in determining the price and production of the system will be greater.

Issues and Solutions: Determine your time line. If you are taking a longer view (e.g., installation in five-seven years) have solar facilities included in your bond's list of projects. Modify your facility plan to include solar power facilities. Determine with your Director of Maintenance and Operations, whether the maintenance should be done by a third-party vendor or whether it can be handled in house with your current or projected resources.

**2. Power Purchase Agreements ("PPA"):** PPAs are probably the most popular of the financing methods for school districts and colleges. Under a PPA, a vendor installs and maintains solar power facilities on district property. The vendor remains the owner of the facility and maintains the facility during the life of the Agreement. The district purchases power from the vendor according to a schedule. The energy purchased would be less than what would otherwise be supplied by a utility provider.

Advantages: The most important advantage is that no significant upfront costs are required. The operation is usually "turn-key" with both installation and maintenance performed by the same vendor. Depending on the circumstances, prices can approach the costs of other methods of financing (e.g., COPS, discussed below).

Disadvantages: Perhaps more than other methods of financing, the devil is in the details. Check carefully the amounts found in the escalator clauses. Check them against estimates of utility energy prices. Look closely at the cost of purchasing the facility at a later date. Most PPAs allow the buyer to purchase the facility after a stated period of time (seven-ten years). Is the purchase price fair?

Issues and solutions: Because the vendor will be performing the installation and maintaining the facility, a number of other issues should be examined closely, including the following:

1. Construction bonds
2. Construction issues such as site access
3. Insurance
4. Site security

**3. Finance with Certificates of Participation ("COP"):** In the COP method, the school district, as lessee, leases the property it is acquiring not from a lender but from a third-party lessor, usually a non-profit corporation or a joint powers agency. The lease payments made by the school district to the third party lessor are assigned to the lender (the COP owners) to repay the debt. Each COP owner is entitled to a proportionate amount of the lease payments made by the school district under the lease; the COPs represent this entitlement.

Advantages: Unlike General Obligation Bonds ("G.O.," discussed below), no voter approval is required. There is significant flexibility in the devising of COPS because they are not creatures of statute. There is therefore, a lack of procedural and other restrictions.

Disadvantages: COPs do not generate additional revenue to pay debt service. Because lease financing by COPs is more complex and less secure than general obligation bond financing, interest rates and costs of issuance are higher. COPs also encumber the property leased, complicating disposition of such property or future borrowing against it.

**4. Finance with General Obligation Bonds ("G.O."):** G.O. Bonds are voter approved long-term debt instruments which are secured by the legal obligation to levy and collect ad valorem property taxes sufficient to pay annual debt service on the bonds. Because G.O. Bonds are secured by the taxing power of the school district, they are considered to pose minimal risk and therefore provide the lowest borrowing costs to the school district of any of the financing vehicles available.

Advantages: G.O. Bonds generate additional revenue to pay debt service with no encroachments upon the general fund. They also provide lower interest rates and costs of issuance because of the strength of the security and simplicity of structure.

Disadvantages: Voter approval is required. Query whether now is a good time to send out a bond for voter approval. There are also debt limitations. There may be other needs of the district that are considered more important. Election requirements impose a long delay between the initiation of the proceeding and the school district's receipt of bond proceeds.

Issues and Solutions: Including solar projects in your bond will boost the bond's attractiveness in most districts. The question is whether you should wait that long to go solar? Politically and administratively, solar power provides good news now for districts that could use it.

**5. Finance with COPs/G.O. Bond Hybrid:** In this scenario, the facility is initially financed by COPs. After the passage of a bond campaign and the issuance of sufficient bonds, the COPs are purchased, and a new and lower interest rate is triggered from the G.O. Bonds.

Advantages: This method combines the best features of the COP and G.O. methods. The facility is acquired quickly and financed at favorable returns and then is refinanced with G.O. Bonds with no further pressure to the general fund. This method will probably save the most money for districts.

Disadvantages: This is the most complex of the transactions and will demand the most of your staff.

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SELF-FINANCE MODEL WITH COPS FOR SOLAR ENERGY

25-YEAR MODEL

COPS ARE DISCOUNTED WITH CSI REBATES

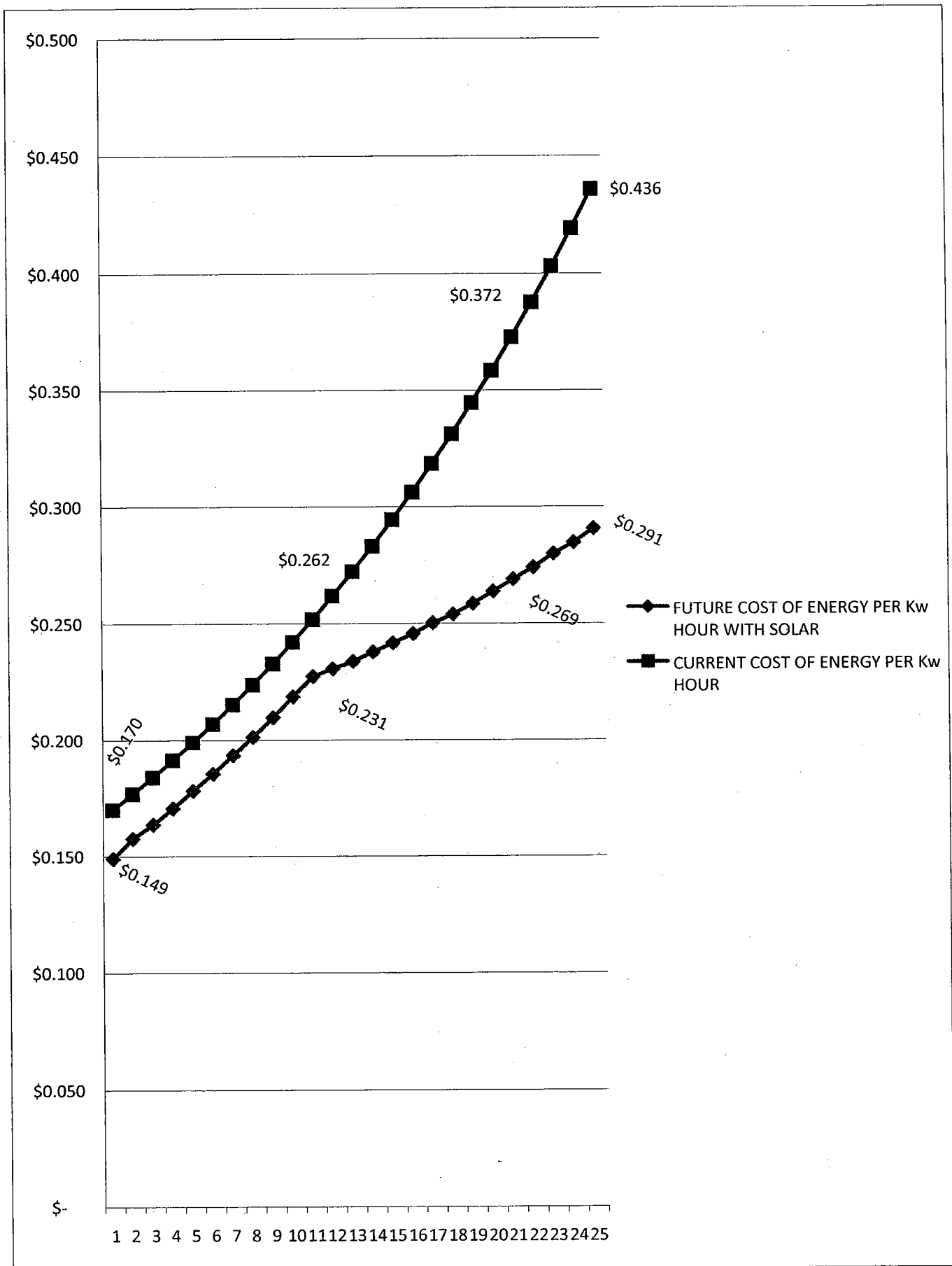
MAINTENANCE AND OPERATION COSTS ARE INCLUDED IN COPS

CURRENT ELECTRIC DEMAND	5,676,270	Kw
PROPOSED SOLAR PRODUCTION	2,980,121	Kw
PROPOSED PG&E ELECTRIC DEMAND	2,696,149	Kw
ESCALATION FOR COST OF ELECTRIC POWER	4%	PER YEAR
CURRENT AVERAGE UNIT COST	\$ 0.170	PER Kw Hour
CURRENT TOTAL PAYMENT TO PG&E	\$ 964,966	
SOLAR PV DEGRADATION PER YEAR	0.50%	
FUTURE COST PER UNIT FOR PG&E UNDER SOLAR	\$ 0.101	PER Kw Hour (YEAR 1)

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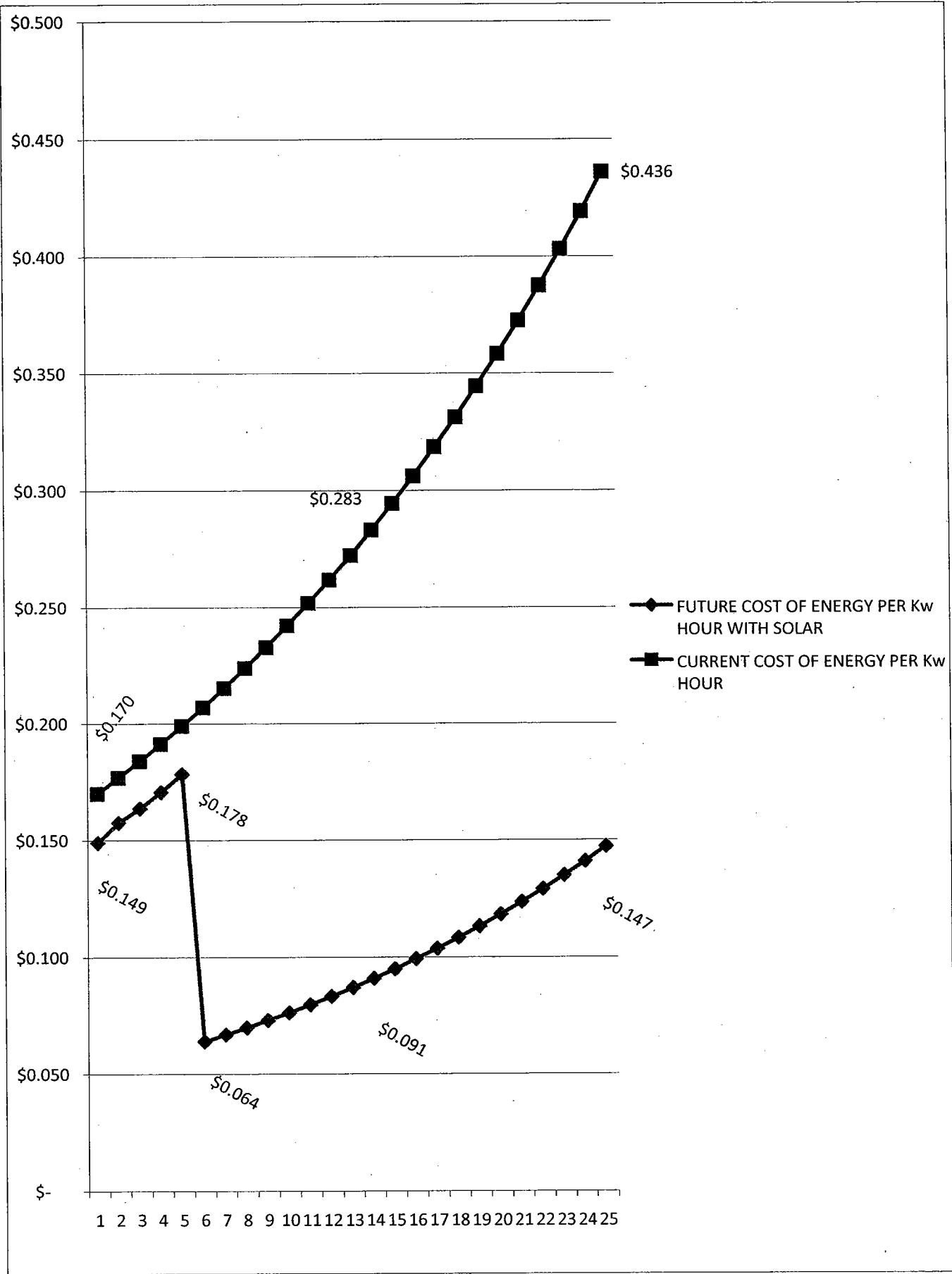
MODEL FOR SOLAR COST FINANCE WITH COP									
YEAR	CURRENT PAYMENTS TO PG&E	FUTURE PAYMENTS TO PG&E WITH SOLAR	NET DEBT SERVICE	TOTAL COST OF ENERGY	SAVINGS DUE TO SOLAR PRODUCTION	FUTURE COST OF ENERGY PER KW HOUR WITH SOLAR	CURRENT COST OF ENERGY PER KW HOUR	VARIANCE	
1	\$ 964,966	\$ (271,465)	\$ 574,258	\$ 845,723	\$ 119,243	\$ 0.149	\$ 0.170	\$ (0.021)	
2	\$ 1,003,565	\$ (283,735)	\$ 610,540	\$ 894,275	\$ 109,289	\$ 0.158	\$ 0.177	\$ (0.019)	
3	\$ 1,043,707	\$ (296,560)	\$ 632,172	\$ 928,732	\$ 114,975	\$ 0.164	\$ 0.184	\$ (0.020)	
4	\$ 1,085,455	\$ (309,965)	\$ 658,038	\$ 968,003	\$ 117,453	\$ 0.171	\$ 0.191	\$ (0.021)	
5	\$ 1,128,874	\$ (323,975)	\$ 687,288	\$ 1,011,263	\$ 117,611	\$ 0.178	\$ 0.199	\$ (0.021)	
6	\$ 1,174,029	\$ (338,619)	\$ 713,878	\$ 1,052,497	\$ 121,532	\$ 0.185	\$ 0.207	\$ (0.022)	
7	\$ 1,220,990	\$ (353,924)	\$ 743,487	\$ 1,097,411	\$ 123,579	\$ 0.193	\$ 0.215	\$ (0.022)	
8	\$ 1,269,829	\$ (369,922)	\$ 771,674	\$ 1,141,596	\$ 128,234	\$ 0.201	\$ 0.224	\$ (0.023)	
9	\$ 1,320,622	\$ (386,642)	\$ 802,764	\$ 1,189,406	\$ 131,216	\$ 0.210	\$ 0.233	\$ (0.023)	
10	\$ 1,373,447	\$ (404,118)	\$ 836,675	\$ 1,240,793	\$ 132,654	\$ 0.219	\$ 0.242	\$ (0.023)	
11	\$ 1,428,385	\$ (422,384)	\$ 868,117	\$ 1,290,501	\$ 137,884	\$ 0.227	\$ 0.252	\$ (0.024)	
12	\$ 1,485,521	\$ (441,476)	\$ 867,141	\$ 1,308,617	\$ 176,904	\$ 0.231	\$ 0.262	\$ (0.031)	
13	\$ 1,544,941	\$ (461,431)	\$ 865,362	\$ 1,326,793	\$ 218,149	\$ 0.234	\$ 0.272	\$ (0.038)	
14	\$ 1,606,739	\$ (482,288)	\$ 867,121	\$ 1,349,409	\$ 257,331	\$ 0.238	\$ 0.283	\$ (0.045)	
15	\$ 1,671,009	\$ (504,087)	\$ 867,573	\$ 1,371,660	\$ 299,349	\$ 0.242	\$ 0.294	\$ (0.053)	
16	\$ 1,737,849	\$ (526,872)	\$ 866,680	\$ 1,393,552	\$ 344,297	\$ 0.246	\$ 0.306	\$ (0.061)	
17	\$ 1,807,363	\$ (550,686)	\$ 869,404	\$ 1,420,090	\$ 387,273	\$ 0.250	\$ 0.318	\$ (0.068)	
18	\$ 1,879,658	\$ (575,577)	\$ 865,462	\$ 1,441,039	\$ 438,618	\$ 0.254	\$ 0.331	\$ (0.077)	
19	\$ 1,954,844	\$ (601,593)	\$ 865,110	\$ 1,466,703	\$ 488,140	\$ 0.258	\$ 0.344	\$ (0.086)	
20	\$ 2,033,038	\$ (628,785)	\$ 868,059	\$ 1,496,844	\$ 536,193	\$ 0.264	\$ 0.358	\$ (0.094)	
21	\$ 2,114,359	\$ (657,207)	\$ 869,005	\$ 1,526,212	\$ 588,148	\$ 0.269	\$ 0.372	\$ (0.104)	
22	\$ 2,198,933	\$ (686,912)	\$ 867,960	\$ 1,554,872	\$ 644,061	\$ 0.274	\$ 0.387	\$ (0.113)	
23	\$ 2,286,891	\$ (717,961)	\$ 869,943	\$ 1,587,904	\$ 698,987	\$ 0.280	\$ 0.403	\$ (0.123)	
24	\$ 2,378,366	\$ (750,413)	\$ 864,780	\$ 1,615,193	\$ 763,174	\$ 0.285	\$ 0.419	\$ (0.134)	
25	\$ 2,473,501	\$ (784,331)	\$ 864,776	\$ 1,649,107	\$ 824,394	\$ 0.291	\$ 0.436	\$ (0.145)	
TOTAL	\$ 40,186,881	\$ (12,130,928)	\$ 20,037,267	\$ 32,168,195	\$ 8,018,687	\$ 0.227	\$ 0.283	\$ (0.057)	





**MODEL FOR SOLAR COST PAYING OFF THE COP WITH A GENERAL OBLIGATION BOND  
AFTER CSI REBATES ARE FULLY REALIZED IN YEAR SIX**

YEAR	CURRENT PAYMENTS TO PG&E	FUTURE PAYMENTS TO PG&E WITH SOLAR	NET DEBT SERVICE	TOTAL COST OF ENERGY	SAVINGS DUE TO SOLAR PRODUCTION	FUTURE COST OF ENERGY PER Kw HOUR WITH SOLAR	CURRENT COST OF ENERGY PER Kw HOUR	VARIANCE
1	\$ 964,966	\$ (271,465)	\$ 574,258	\$ 845,723	\$ 119,243	\$ 0.149	\$ 0.170	\$ (0.021)
2	\$ 1,003,565	\$ (283,735)	\$ 610,540	\$ 894,275	\$ 109,289	\$ 0.158	\$ 0.177	\$ (0.019)
3	\$ 1,043,707	\$ (296,560)	\$ 632,172	\$ 928,732	\$ 114,975	\$ 0.164	\$ 0.184	\$ (0.020)
4	\$ 1,085,455	\$ (309,965)	\$ 658,038	\$ 968,003	\$ 117,453	\$ 0.171	\$ 0.191	\$ (0.021)
5	\$ 1,128,874	\$ (323,975)	\$ 687,288	\$ 1,011,263	\$ 117,611	\$ 0.178	\$ 0.199	\$ (0.021)
6	\$ 1,174,029	\$ (338,619)	\$ 24,333	\$ 362,952	\$ 811,077	\$ 0.064	\$ 0.207	\$ (0.143)
7	\$ 1,220,990	\$ (353,924)	\$ 25,306	\$ 379,231	\$ 841,759	\$ 0.067	\$ 0.215	\$ (0.148)
8	\$ 1,269,829	\$ (369,922)	\$ 26,319	\$ 396,240	\$ 873,589	\$ 0.070	\$ 0.224	\$ (0.154)
9	\$ 1,320,622	\$ (386,642)	\$ 27,371	\$ 414,013	\$ 906,609	\$ 0.073	\$ 0.233	\$ (0.160)
10	\$ 1,373,447	\$ (404,118)	\$ 28,466	\$ 432,584	\$ 940,863	\$ 0.076	\$ 0.242	\$ (0.166)
11	\$ 1,428,385	\$ (422,384)	\$ 29,605	\$ 451,989	\$ 976,396	\$ 0.080	\$ 0.252	\$ (0.172)
12	\$ 1,485,521	\$ (441,476)	\$ 30,789	\$ 472,265	\$ 1,013,255	\$ 0.083	\$ 0.262	\$ (0.179)
13	\$ 1,544,941	\$ (461,431)	\$ 32,021	\$ 493,452	\$ 1,051,490	\$ 0.087	\$ 0.272	\$ (0.185)
14	\$ 1,606,739	\$ (482,288)	\$ 33,301	\$ 515,589	\$ 1,091,150	\$ 0.091	\$ 0.283	\$ (0.192)
15	\$ 1,671,009	\$ (504,087)	\$ 34,634	\$ 538,720	\$ 1,132,288	\$ 0.095	\$ 0.294	\$ (0.199)
16	\$ 1,737,849	\$ (526,872)	\$ 36,019	\$ 562,891	\$ 1,174,959	\$ 0.099	\$ 0.306	\$ (0.207)
17	\$ 1,807,363	\$ (550,686)	\$ 37,460	\$ 588,146	\$ 1,219,217	\$ 0.104	\$ 0.318	\$ (0.215)
18	\$ 1,879,658	\$ (575,577)	\$ 38,958	\$ 614,535	\$ 1,265,122	\$ 0.108	\$ 0.331	\$ (0.223)
19	\$ 1,954,844	\$ (601,593)	\$ 40,516	\$ 642,110	\$ 1,312,734	\$ 0.113	\$ 0.344	\$ (0.231)
20	\$ 2,033,038	\$ (628,785)	\$ 42,137	\$ 670,922	\$ 1,362,115	\$ 0.118	\$ 0.358	\$ (0.240)
21	\$ 2,114,359	\$ (657,207)	\$ 43,822	\$ 701,029	\$ 1,413,330	\$ 0.124	\$ 0.372	\$ (0.249)
22	\$ 2,198,933	\$ (686,912)	\$ 45,575	\$ 732,488	\$ 1,466,446	\$ 0.129	\$ 0.387	\$ (0.258)
23	\$ 2,286,891	\$ (717,961)	\$ 47,398	\$ 765,359	\$ 1,521,532	\$ 0.135	\$ 0.403	\$ (0.268)
24	\$ 2,378,366	\$ (750,413)	\$ 49,294	\$ 799,707	\$ 1,578,660	\$ 0.141	\$ 0.419	\$ (0.278)
25	\$ 2,473,501	\$ (784,331)	\$ 51,266	\$ 835,597	\$ 1,637,904	\$ 0.147	\$ 0.436	\$ (0.289)
TOTAL	\$ 40,186,881	\$ (12,130,928)	\$ 3,886,888	\$ 16,017,815	\$ 24,169,066	\$ 0.113	\$ 0.283	\$ (0.170)



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SELF FINANCE MODEL WITH COP'S FOR SOLAR ENERGY

25 YEAR MODEL

COP'S ARE DISCOUNTED WITH CSI REBATES

MAINTENANCE AND OPERATION COSTS ARE INCLUDED IN COP'S

CURRENT ELECTRIC DEMAND	5,676,270 Kw
PROPOSED SOLAR PRODUCTION	2,980,121 Kw
PROPOSED PG&E ELECTRIC DEMAND	2,696,149 Kw
ESCALATION FOR COST OF ELECTRIC POWER	4% PER YEAR
CURRENT AVERAGE UNIT COST	\$ 0.170 PER Kw Hour
CURRENT TOTAL PAYMENT TO PG&E	\$ 964,966
SOLAR PV DEGRADATION PER YEAR	0.50%
FUTURE COST PER UNIT FOR PG&E UNDER SOLAR	\$ 0.101 PER Kw Hour (YEAR 1)

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