BEFORE THE PUBLIC UTILITIES COMMISSION
OF THE STATE OF CALIFORNIA

Application of Pacific Gas and Electric Company to Revise its Electric Marginal Costs, Revenue Allocation and Rate Design. (U39M)	Application 13-04-012 (Filed April 18, 2013)

PREPARED REBUTTAL TESTIMONY OF RICK BROWN ON BEHALF OF THE CALIFORNIA SOLAR ENERGY INDUSTRIES ASSOCIATION

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Q **Please state your name, occupation and business address.**

A My name is Rick Brown. I am President and Co-Founder of TerraVerde Renewable Partners. TerraVerde Renewable Partners develops renewable energy facilities and provides comprehensive energy management services for public agencies, school districts, and non-profit building and property owners. The business address is 1100 Larkspur Landing Circle, Suite 155, Larkspur, CA 94939.

Q **Please describe your professional background.**

A I launched TerraVerde Renewable Partners in 2009. As President of TerraVerde, I lead a team that has assisted clients in implementing solar and energy cost reduction projects with a total cost savings estimated at more than $124 million over the first 25 years of the systems' operations, and we have an additional 54 project sites under development. I played a key role in the successful passage of SB 585 (Kehoe), legislation that added $200 million to the non-residential category of the California Solar Initiative Rebate Program. I was also closely involved in the crafting of SB 73, legislation guiding development of California's Prop 39 program. More recently, I led the effort to have the California Association of School Business Officials (CASBO) select TerraVerde as its energy strategic partner. Previously, I successfully helped start up and build MMA Renewable Ventures, eventually selling it to an international solar company. MMA Renewables developed more than 60 MW of commercial and utility scale solar projects.

Earlier in my career, as Managing Partner of The Results Group, I provided consultation on organizational strategy and leadership to numerous public, private and non-profit organizations, including: California School Employees Association (CSEA), California Public Employees Retirement System (CalPERS), California State Teachers Retirement System (STRS), Kaiser-Permanente, Agilent Technologies, Association of Bay Area Governments and Earthjustice. From 1993-1999, I was a Board Trustee at Twin Hills Unified School District.

Q **On whose behalf are you testifying in this proceeding?**

A This testimony is presented on behalf of the California Solar Energy Industries Association (CALSEIA). CALSEIA is a 501(C)(6) not-for-profit solar industry trade association with more than 200 company members involved in the solar energy business in California.[1] CALSEIA is an active participant in a number of Commission proceedings addressing state policy and electric utility rates. Changes to electricity rates have direct economic impacts on the current and prospective customers of CALSEIA's member companies and may help or hinder the companies' ability to market solar energy products. TerraVerde Renewable Partners is a member of this industry trade association.

Q **What is CALSEIA's interest in this proceeding?**

A Many CALSEIA member companies provide commercial customers in the Pacific Gas & Electric (PG&E) service territory with solar systems to meet parts of their energy needs. The rates available to those customers are a key determinant in their ability to make prudent investments in solar electric generating equipment.

Q **What is the purpose of your testimony?**

A PG&E proposes to reduce eligibility for Schedule A-6 to customers with less than 75 kW maximum demand. CALSEIA recommends that the Commission reject that proposal. I present case studies to demonstrate the difference in project economics between customers taking service under Schedule A-6 and Schedules A-10 and E-19, the default tariff for medium-sized commercial customers and a voluntary tariff for medium-sized commercial customers.

It is my intention to offer a customer-focused perspective. I draw on my own experience and the experience of other CALSEIA members who have a solid understanding of what it takes for utility customers to make investments in solar systems. The state has large goals for clean

[1] CALSEIA's member companies are listed at: http://calseia.org/find-a-solar-energy-expert/

energy development and needs customers to be convinced of the financial merits of investing in solar to meet those goals.[2]

Q **How do the differences between Schedules A-6, A-10 and E-19 affect solar customers?**

A The key difference is the demand charge rates in A-10 and E-19. Although solar is very good at reducing the amount of energy consumed by a customer, it is not very good at reliably reducing peak demand for reasons explained below. By recovering a large portion of its costs in demand charges, PG&E's Schedule A-10 and E-19 rates are biased against solar. Schedule A-6 alleviates this bias, allowing the utility to recover its costs through energy charges and enabling customers to invest in self-generation.

Table 1. Demand and Energy Charges in PG&E Tariffs

	Time Period	A-6	A-10	E-19
Demand Charges ($/kW)	Summer		13.87	12.56
	Peak Summer			17.65
	Part-Peak Summer			4.07
	Winter		6.46	12.56
	Part-Peak Winter			0.21
Energy Charges (cents/kWh)	Peak Summer	56.6	17.5	16.3
	Part-Peak Summer	26.3	16.7	11.1
	Off-Peak Summer	14.8	14.4	7.8
	Part-Peak Winter	16.9	12.8	10.5
	Off-Peak Winter	13.8	10.8	8.2

Q **What types of commercial customers are able to make prudent investments in solar systems under Schedule A-10 and what types are not?**

A Systems with high energy output compared with installed cost can overcome the anti-solar bias of demand charges. Any rooftop system has to be on an unobstructed roof that is large enough to handle the energy demand. Larger buildings tend to consume more energy, and available roof space is often not sufficient to offset demand using standard efficiency panels and easily configured racking systems. High efficiency panels are more expensive. Complex configurations cost more money to design and install. Electrical rooms sometimes need to be modified to accommodate system components. Complex systems require more work to get

[2] Many of the issues involved in this case are identical to issues in the Southern California Edison 2013 Rate Design Window (A.13-12-015). My colleague Charles Monk and I both worked on the testimony for each of these proceedings. Thus, some of the language herein is common to both sets of testimony.

through the interconnection process. If the building has a large roof with respect to its energy demand and no complicating factors, it can be inexpensive enough to install a solar system that Schedule A-10 will work. However, if the available tariffs limit solar installations to those perfect situations, there will be a lot of good solar sites that have to continue getting all of their power from the grid because investments in on-site generation do not make sense.

Another type of installation that can make sense under A-10 is a very large open field situated right next to a building with high electricity demand, but the system has to be large enough to offset the added cost of hiring a subcontractor to install the ground-mounted racking.

More often, customers want to install solar on shade structures over the parking lot. Most customers do not have a large empty field next to their buildings or perfect roofs, and many want to use the parking lot for a solar installation. But these systems are mostly out of the question if demand charges are too high. Shade structures are more expensive than the cheapest ground-mounted racking systems. Unless the customer's on-site generation is able to reduce its utility bill significantly it will not be able to recover that added cost. I talk to a lot of customers who want to solarize their parking lots, and those sites would not be viable for solar installations under high demand charge rates.

I work with many school systems to explore options for installing solar, and school sites have the added challenge of requiring the approval of the Division of State Architects (DSA). In the best of circumstances this is simply a separate permitting review that adds a small amount of cost, but quite often DSA is more stringent than local permitting authorities and significant additional engineering and administrative work is necessary. Additionally, solar installations for public agencies are normally subject to prevailing wage requirements, creating above average labor costs. This makes it all the more important for a school to have ideal installation conditions for it to work under A-10.

Those are site characteristics that can be enabling or limiting. Also important are the characteristics of a customer's load profile, most importantly with respect to load factor – the ratio of average load to maximum load for a customer. Customers with high load factors have an easier time making solar project economics work than customers with low load factors. If a customer's electricity consumption curve is smooth, follows a regular bell shape, and is consistent day to day, the average load will be closer to the maximum load and it will have a higher load factor. If a customer's load curve is "spiky" or jagged, or is variable throughout the month, the maximum load will be more distant from the average and it will have a lower load factor.

In sum, it is certainly true that customers with ideal physical locations and high load factors are able to make prudent investments in solar under Schedule A-10, but that is a very limited universe. To meet aggressive state goals for clean energy development, an environment in which a wider range of customers has viable opportunities to invest in solar energy systems is necessary.

Q **How do A-6 and A-10 compare in terms of capital recovery periods for customers?**

A We analyzed two standard load profiles under A-6 and A-10 to measure the difference in the capital recovery periods for customers. These load profiles are anonymized data sets published for research purposes by EnerNOC, a grid services company that aims to facilitate innovation for a smart grid. The profiles are from California commercial customers that EnerNOC judges to be typical of their sectors. One is a business services building and the other is a food processing facility.[3]

We analyzed each of these profiles in conjunction with two types of solar installation sites. One site is in the Central Valley on a building with an ideal roof and no complicating factors that would increase the installation price. The other is near the coast on a roof that is oriented 20 degrees off of due south, with 7.7% shading, and building challenges that would increase the installation cost by 5%. Then we measured the capital recovery period for each of these scenarios under Schedules A-6 and A-10.

The results are shown in Table 2. In each of the four scenarios under A-6, the capital recovery period is 5.2-7.7 years. Under A-10, it is 7.9-9.5 years. In other words, even with ideal conditions the best an A-10 customer can achieve is capital recovery after nearly eight years, and at an installation site that is good but not perfect the customer will not recover the initial outlay for more than nine years.

Most commercial customers expect to achieve capital recovery in five years. Expecting customers to wait nine years to recoup their initial investment and another decade to earn a reasonable rate of return has never been successful in the marketplace.

[3] EnerNOC standard load profiles are available at http://open.enernoc.com/data.

It should be noted that this analysis errs on the side of underestimating capital recovery periods because it does not consider the time value of money. Investing in solar generation involves an opportunity cost, because a customer's capital would otherwise be earning a return elsewhere. Thus, the simple payback figures in this testimony present a capital recovery period that is shorter than a more accurate "discounted payback" analysis would show.

Table 2. Capital Recovery Periods by Tariff and Installation Type[4]

Customer Sector	Business Services			
Installation Site	Ideal		Good	
Tariff	A6	A10	A6	A10
System Size (kW)	750	750	750	750
Annual Production (kWh)	1,150,238	1,150,238	987,655	987,655
Annual Consumption (kWh)	1,914,992	1,914,992	1,914,992	1,914,992
Price Per Watt	$3.00	$3.00	$3.15	$3.15
Total Cost	$2,250,180	$2,250,180	$2,362,689	$2,362,689
First Year Bill Savings	$237,221	$170,518	$187,078	$145,849
Capital Recovery Period (Years)	**6.0**	**7.9**	**7.7**	**9.4**
Customer Sector	Food Processor			
Installation Site	Ideal		Good	
Tariff	A6	A10	A6	A10
System Size (kW)	140	140	140	140
Annual Production (kWh)	211,587	211,587	181,680	181,680
Annual Consumption (kWh)	279,561	279,561	279,561	279,561
Price Per Watt	$3.00	$3.00	$3.15	$3.15
Total Cost	$420,390	$420,390	$441,410	$441,410
First Year Bill Savings	$52,620	$31,367	$43,396	$26,829
Capital Recovery Period (Years)	**5.2**	**8.1**	**6.4**	**9.5**

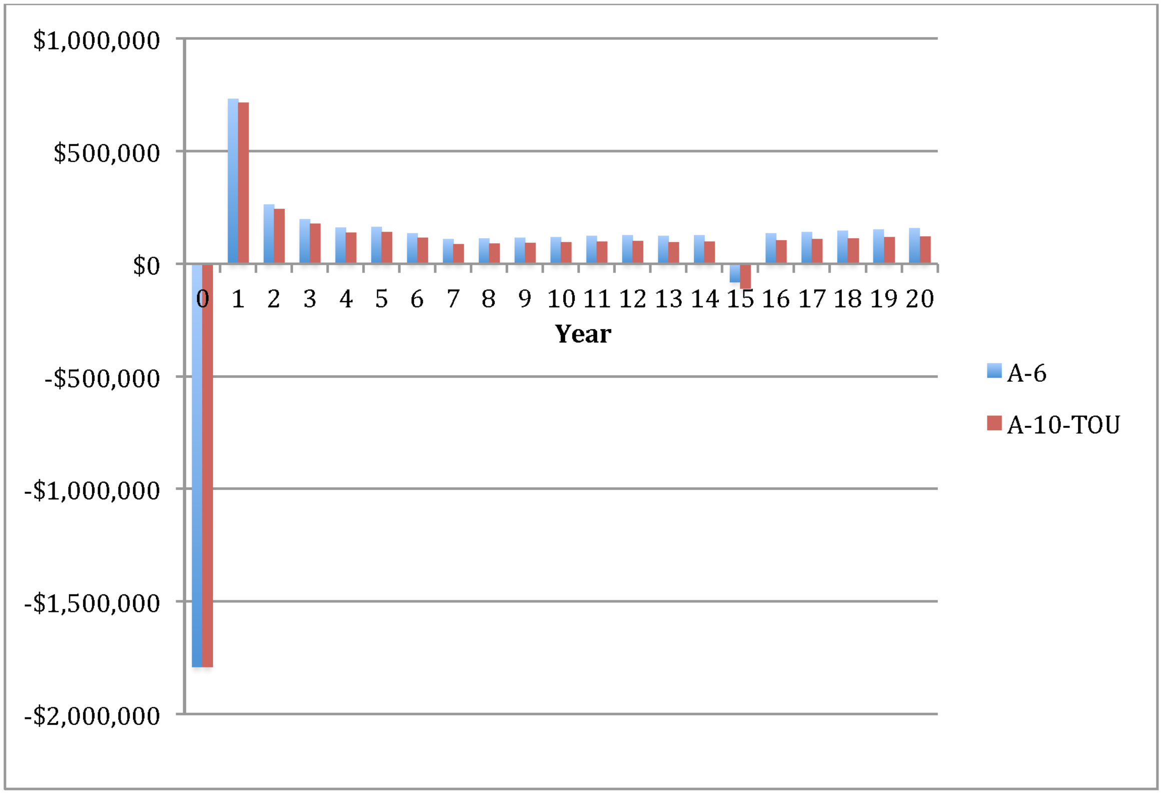
Q **What does the annual cash flow look like for these types of scenarios?**

A Figure 1 shows the cash flow for a private college building in PG&E territory. With this building's electricity usage pattern and site characteristics, the capital recovery period is in line with those calculated from the EnerNOC stock profiles. Under A-6, the capital recovery period is 7.2 years, and under A-10 it is 8.9 years. The annual financial savings are small in comparison to the upfront investment under both A-6 and A-10, but the savings are greater under

[4] This analysis was performed using the OnGrid Tool, a solar project evaluation model widely used by solar professionals throughout the U.S. and Canada. It assumes an annual utility rate escalator of 4%, customer federal income tax rate of 21%, and an annual module degradation rate of 0.5%

A-6. This level of difference in annual savings will change many projects from being uneconomic to being acceptable for customers.

Figure 1. Cash Flow Comparison of A-6 and A-10 for Private College



Q **In those examples, customers are purchasing solar systems with cash. How does financing change the picture?**

A Financing has the impact of adding to the project cost and thereby increases the capital recovery period and decreases the rate of return. We asked Mission Capital to review the scenarios from the EnerNOC data and explain which ones are financeable. Mission Capital is a lender with 25 years of experience providing loans to small businesses for equipment purchases, and has developed a specialization in solar loans. Their response is included in this testimony as Appendix A.

In this funding model, the financial institution lends money to the customer for the installation of a solar system and allows the customer to use the federal tax credit. In this way, for customers who have enough tax appetite, the loan can be stretched out long enough for the customer to stay cash flow positive. However, in some years the finance payments are higher than the utility savings such that cumulative savings decline until the loan is repaid, and the customer is taking a risk that the utility savings will be realized according to expectations of gradual rate increases. If those savings are realized, the customer is in the clear with a positive return on investment only after the term of the loan.

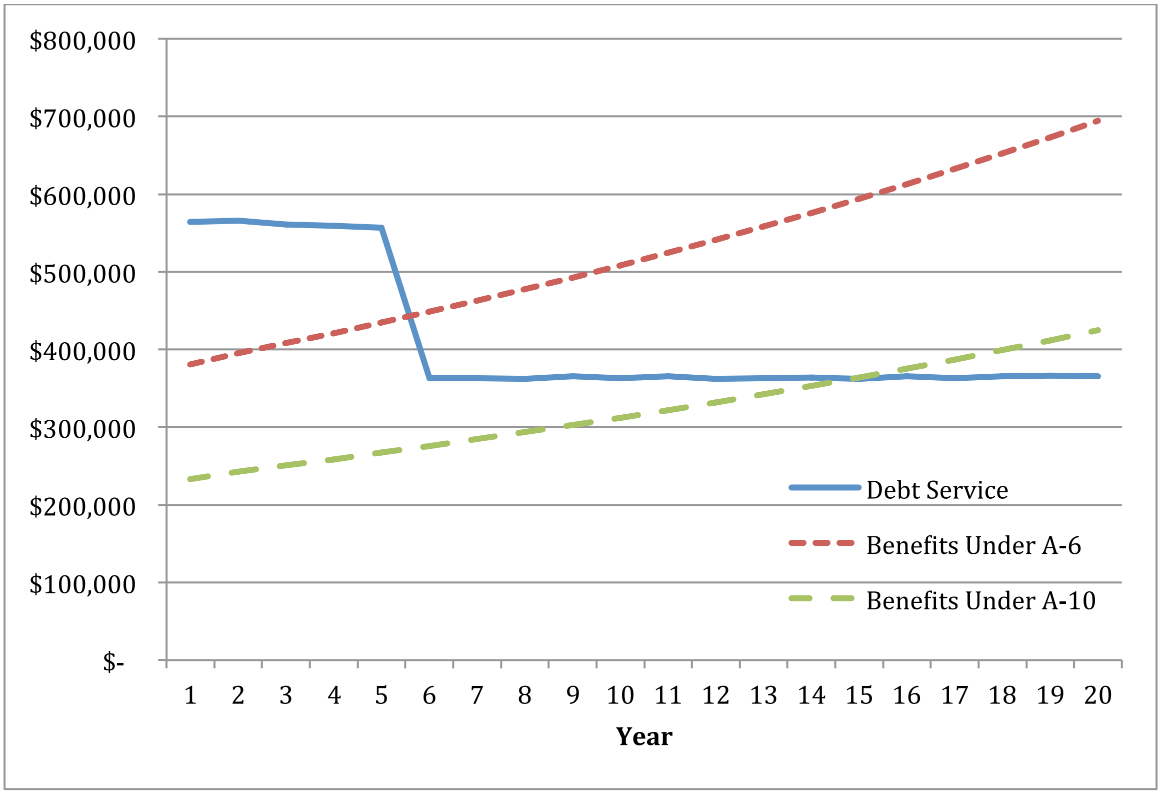
Mission Capital's analysis found that the scenarios using Schedule A-6 can be financed with loan terms ranging from 5 years for the ideal installation to 10 years for an average installation. Under A-10, loan terms range from 10 years to 14 years. Customers generally require loan terms of seven years or less and rarely accept terms as long as ten years.

Q **Can you show us an example of a customer that TerraVerde has worked with?**

A TerraVerde Renewable Partners installed solar systems with a combined capacity of 1.2 MW at seven school locations in the Golden Valley Unified School District in Madera County in 2012. This is a medium-sized school district in PG&E service territory in the Central Valley. Approximately 53% of the students are from low-income families. The leadership of the school understands the value of investing in energy infrastructure as a way to free up money to better serve its students.

School districts often finance solar installations with 20-year bond-funded Certificates of Participation ("public COPs"). Under Schedule A-6, the capital recovery period is 12 years for a project with characteristics identical to the facilities and installations in Golden Valley. Under Schedule A-10, the 20-year utility bill savings are less than the debt payments and maintenance costs. Clearly, a school district would never build a system like this without the availability of Schedule A-6. After having made the investment, removal of eligibility for Schedule A-6 would push the school district under water with its loans.

Figure 2. Cash Flow Comparison of A-6 vs A-10 for Golden Valley School District

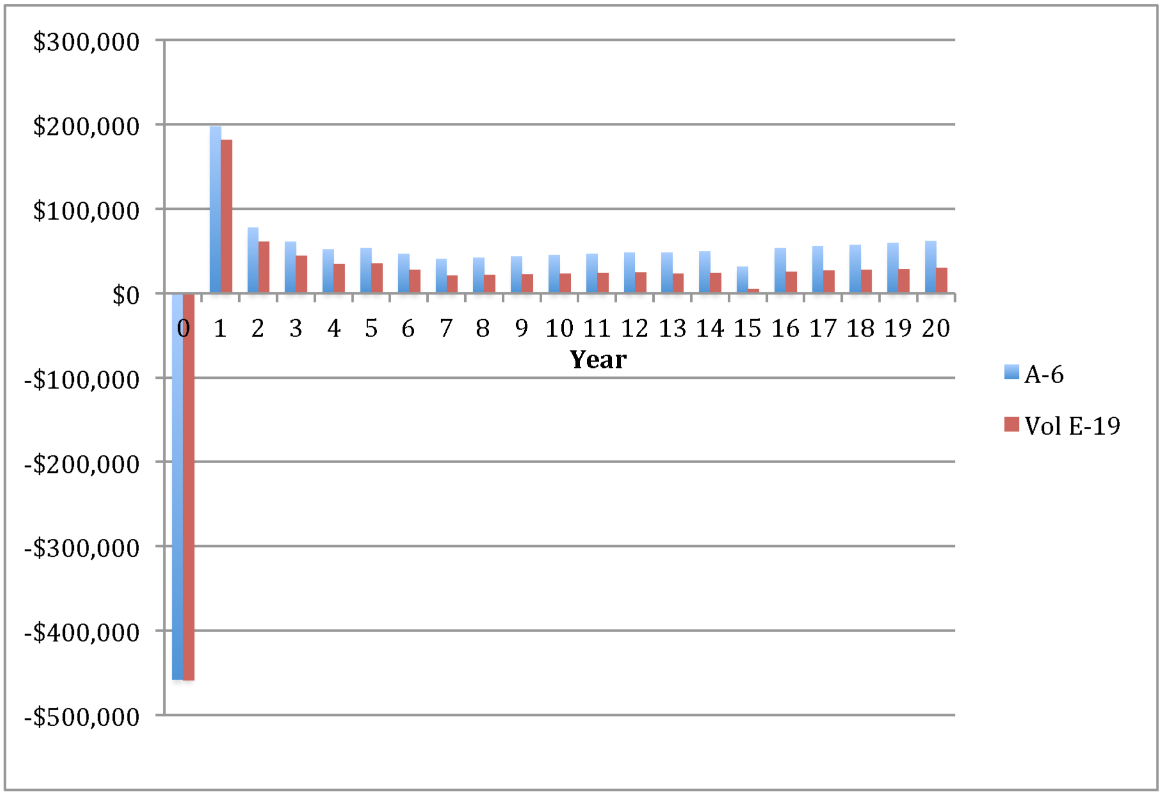


Q **Is there a similar difference in capital recovery periods between A-6 and E-19?**

A Yes. Some customers who qualify for A-10 are better off under E-19 if they have heavy usage during off-peak periods, because the off-peak kWh energy charge under E-19 is much less than it is under A-10. One such customer, a manufacturer in PG&E service territory, is currently considering a 135 kW solar installation from a CALSEIA member company. The capital recovery period under A-6 would be 5.3 years and the 25-year internal rate of return (IRR) would be 15.9%. Under voluntary E-19, the capital recovery period would be 9.4 years and the 25-year IRR would be 8.5%. It is highly unlikely that the customer would make the investment with the longer capital recovery period.

Regarding IRR, it is important to note that until the capital recovery period is reached, the rate of return is negative. The investment then has a positive return, but doesn't reach the 25-year rate of return until the end of the 25th year. With a traditional investment instrument where the investor expects to receive a positive return beginning immediately, an 8.5% rate of return is attractive. In contrast, that rate is not attractive if the investor doesn't see that level of return for a quarter-century.

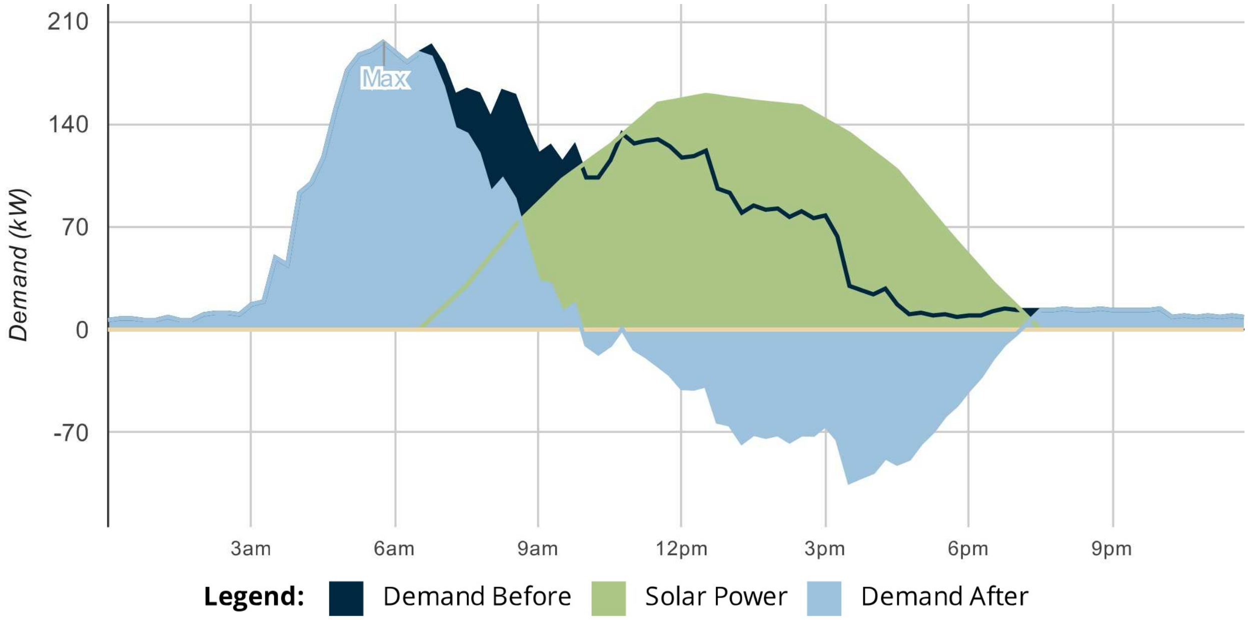
Figure 3. Cash Flow Comparison of A-6 and Voluntary E-19 for Manufacturer



Q **Do demand charges accurately reflect a customer's impact on utility costs?**

A No. For example, a CALSEIA member company installed a 219 kW solar system for a manufacturer in 2013. The company's daily peak demand occurs between 5:00 am and 7:00 am as workers start their shifts and turn on equipment. They are normally done with production by early afternoon. You can see in Figure 4 that solar is not reducing this customer's peak demand and that the peak demand occurs in the early morning. Most months for this customer have similar demand profiles, but this graph is from the maximum demand day in July and therefore shows that the negative demand in the afternoon and early evening is benefitting the grid during summer when total system demand is high.

Figure 4. Maximum Demand Before and After Solar for Manufacturer



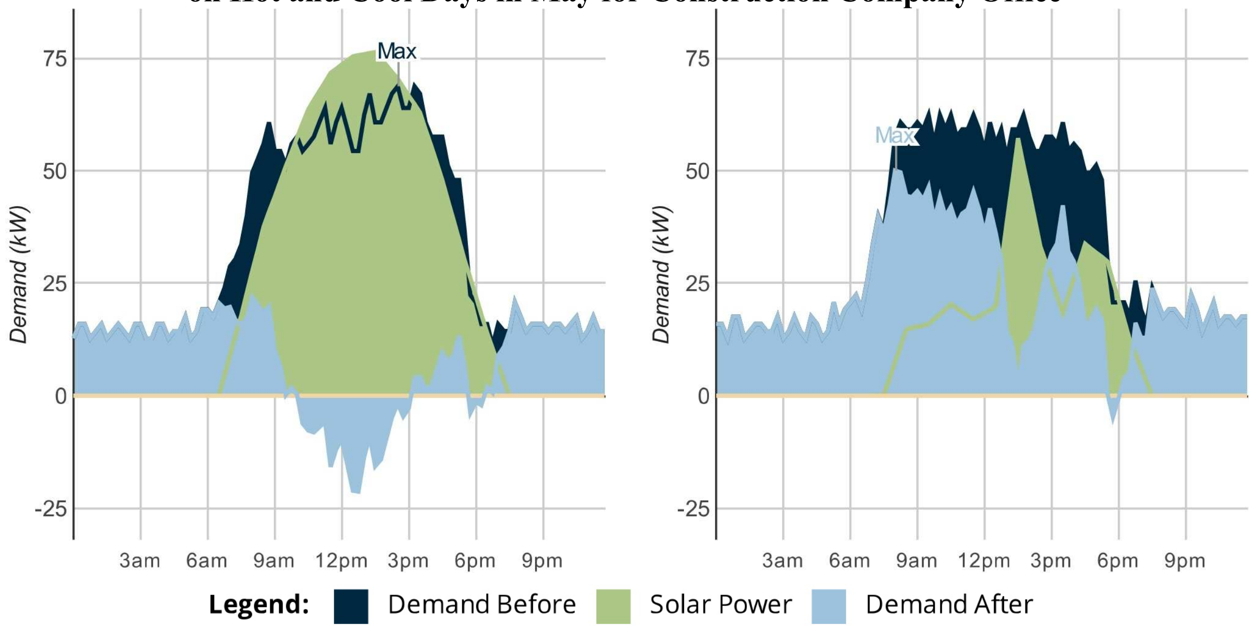
At the system peak demand times that drive much of the utility's costs, this customer is alleviating strain on the system by producing excess generation and supplying other customers on the local circuit with electricity. Under A-10, this type of customer pays high demand charges even though the electricity it consumes is mostly consumed at times of low demand on the system.

Q **How much do solar systems impact demand charges?**

A Not very much, but that is not because solar systems aren't reducing stress on the grid. It is because demand charges are a poor way to reflect stress on the grid.

Figure 5 shows the demand curve of a construction company office and the impact that a 100 kW solar system would have. Demand charges would unreasonably penalize this customer under a rate structure with high demand charges. On hot, sunny days when the electricity system may be constrained, solar production is high and the customer would be drawing only one-third as much electricity from the grid as it is without solar. The solar system would be reducing net demand when the system needs customers to reduce demand. On the following day the weather is cloudy and cooler, so solar production is low and the customer needs more electricity from the grid. Because of the cooler weather the system is very unlikely to be constrained, yet the customer would pay high demand charges based on that day's usage.

Figure 5. Actual Demand and Projected Solar Production on Hot and Cool Days in May for Construction Company Office



A solar customer's monthly demand charge is based on cloudy days even though the system likely has excess capacity on those days. A solar customer is benefitting the electricity system on the sunny days when the system was likely to be constrained, but those days do not determine the demand charges that the customer pays.

Q **How are these demand curves calculated?**

A The projections of solar system production were performed using PVWATTS, an open-source tool developed by the National Renewable Energy Laboratory. The tool analyzed 29 years of hourly solar radiation and meteorological elements to determine the "typical meteorological month" for each month in each zip code. Using inputs of the solar system characteristics, it models the daily production of that solar system in that location.

We then loaded the customers' actual electricity demand data into Energy Toolbase, a subscription service widely used by the solar industry to measure project economics. Energy Toolbase compares that demand with the production data from PVWATTS to determine customer costs before and after installing a solar system.

Q **Does that conclude your testimony?**

A Yes, it does.

Appendix A

Mission Capital Analysis of Loan Terms for Standardized Solar Installation Scenarios

MISSION CAPITAL

Solar Financing for

Business Services

Inland location
Schedule A6

cost per Watt	**$3.00**
kWh/yr per kW	**1534**
avg savings/kWh	**$0.206**
payback =	**7.01 yrs**

SYSTEM OVERVIEW

System size, kW DC		750.000
First year output, kWh		1,150,238
Equipment cost		$2,250,180
First year utility savings		$237,221
Annual savings increase		4.00%
Federal tax credit	30%	$675,054

FINANCING SUMMARY

Amount to finance	$2,250,180
Initial investment	none
Solar tax benefits go to	Lessee
Term (months)	84
Monthly lease payment	$32,708
Balloon pmt	none

CASH FLOW ANALYSIS

year	savings on utilities	rebates, grants	federal tax credit	other tax effects	finance payments	net annual cash flow	cumulative savings
1	$237,221		$675,054	$100,776	($392,500)	$620,551	$620,551
2	245,476			176,140	(392,500)	29,116	649,667
3	254,019			77,246	(392,500)	(61,235)	588,432
4	262,859			13,735	(392,500)	(115,907)	472,525
5	272,006			3,544	(392,500)	(116,950)	355,575
6	281,472			(47,516)	(392,500)	(158,544)	197,031
7	291,267			(99,212)	(392,500)	(200,445)	(3,414)
8	301,403			(106,528)		194,875	191,462
9	311,892			(110,235)		201,657	393,119
10	322,746			(114,071)		208,675	601,794
11	333,978			(118,041)		215,937	817,730
12	345,600			(122,149)		223,451	1,041,181
13	357,627			(126,400)		231,227	1,272,408
14	370,072			(130,798)		239,274	1,511,682
15	382,951			(135,350)		247,601	1,759,283
16	396,278			(140,060)		256,217	2,015,500
17	410,068			(144,934)		265,134	2,280,634
18	424,338			(149,978)		274,360	2,554,994
19	439,105			(155,197)		283,908	2,838,902
20	454,386			(160,598)		293,788	3,132,690
21	470,199			(166,187)		304,012	3,436,702
22	486,562			(171,970)		314,591	3,751,293
23	503,494			(177,955)		325,539	4,076,832
24	521,016			(184,148)		336,868	4,413,700
25	539,147			(190,556)		348,591	4,762,291
	$9,215,182		**$675,054**	**($2,380,445)**	**($2,747,500)**	**$4,762,291**	
	total utility savings	|------total incentives------|		net tax effects	finance payments	**SOLAR CASH BENEFIT**	

Mission Capital Solar Finance solutions@missioncapitalfund.com 707.431.2678

MISSION CAPITAL

Solar Financing for
Business Services
Inland location
Schedule A10

cost per Watt	$3.00
kWh/yr per kW	1534
avg savings/kWh	$0.148
payback =	**10.6 yrs**

SYSTEM OVERVIEW

System size, kW DC		750.000
First year output, kWh		1,150,238
Equipment cost		$2,250,180
First year utility savings		$170,518
Annual savings increase		4.00%
Federal tax credit	30%	$675,054

FINANCING SUMMARY

Amount to finance	$2,250,180
Initial investment	none
Solar tax benefits go to	Lessee
Term (months)	120
Monthly lease payment	$25,245
Balloon pmt	none

CASH FLOW ANALYSIS

year	savings on utilities	rebates, grants	federal tax credit	other tax effects	finance payments	net annual cash flow	cumulative savings
1	$170,518		$675,054	$128,134	($302,944)	$670,762	$670,762
2	176,452			206,286	(302,944)	79,794	750,555
3	182,593			110,316	(302,944)	(10,036)	740,519
4	188,947			49,870	(302,944)	(64,127)	676,392
5	195,522			42,895	(302,944)	(64,527)	611,865
6	202,326			(4,793)	(302,944)	(105,411)	506,454
7	209,367			(52,952)	(302,944)	(146,529)	359,925
8	216,653			(61,152)	(302,944)	(147,443)	212,483
9	224,193			(69,809)	(302,944)	(148,560)	63,923
10	231,995			(78,950)	(302,944)	(149,900)	(85,977)
11	240,068			(84,850)		155,218	69,242
12	248,422			(87,802)		160,620	229,862
13	257,068			(90,858)		166,210	396,071
14	266,014			(94,020)		171,994	568,065
15	275,271			(97,292)		177,979	746,044
16	284,850			(100,677)		184,173	930,217
17	294,763			(104,181)		190,582	1,120,799
18	305,021			(107,807)		197,214	1,318,013
19	315,635			(111,558)		204,077	1,522,090
20	326,620			(115,440)		211,179	1,733,269
21	337,986			(119,458)		218,528	1,951,798
22	349,748			(123,615)		226,133	2,177,931
23	361,919			(127,917)		234,002	2,411,933
24	374,514			(132,368)		242,146	2,654,079
25	387,547			(136,975)		250,572	2,904,651
	$6,624,011 total utility savings	|------total incentives------|	**$675,054**	**($1,364,972)** net tax effects	**($3,029,442)** finance payments	**$2,904,651** SOLAR CASH BENEFIT	

Mission Capital Solar Finance solutions@missioncapitalfund.com 707.431.2678

MISSION CAPITAL

Solar Financing for

Business Services

Coastal location
Schedule A6

cost per Watt	**$3.15**
kWh/yr per kW	**1317**
avg savings/kWh	**$0.189**

payback = 10.2 yrs

SYSTEM OVERVIEW

System size, kW DC		750.000
First year output, kWh		987,655
Equipment cost		$2,362,689
First year utility savings		$187,078
Annual savings increase		4.00%
Federal tax credit	30%	$708,807

FINANCING SUMMARY

Amount to finance	$2,362,689
Initial investment	none
Solar tax benefits go to	Lessee
Term (months)	120
Monthly lease payment	$26,508
Balloon pmt	none

CASH FLOW ANALYSIS

year	savings on utilities	rebates, grants	federal tax credit	other tax effects	finance payments	net annual cash flow	cumulative savings
1	$187,078		$708,807	$131,701	($318,091)	$709,494	$709,494
2	193,588			213,662	(318,091)	89,159	798,653
3	200,325			112,791	(318,091)	(4,975)	793,678
4	207,297			49,217	(318,091)	(61,577)	732,100
5	214,510			41,784	(318,091)	(61,797)	670,303
6	221,975			(8,402)	(318,091)	(104,518)	565,785
7	229,700			(59,086)	(318,091)	(147,477)	418,308
8	237,694			(67,817)	(318,091)	(148,215)	270,093
9	245,965			(77,032)	(318,091)	(149,158)	120,934
10	254,525			(86,761)	(318,091)	(150,327)	(29,393)
11	263,383			(93,090)		170,293	140,900
12	272,548			(96,329)		176,219	317,119
13	282,033			(99,682)		182,351	499,470
14	291,848			(103,151)		188,697	688,167
15	302,004			(106,740)		195,264	883,430
16	312,514			(110,455)		202,059	1,085,489
17	323,389			(114,299)		209,090	1,294,580
18	334,643			(118,276)		216,367	1,510,947
19	346,289			(122,392)		223,896	1,734,843
20	358,340			(126,652)		231,688	1,966,531
21	370,810			(131,059)		239,751	2,206,282
22	383,714			(135,620)		248,094	2,454,376
23	397,067			(140,339)		256,728	2,711,103
24	410,885			(145,223)		265,662	2,976,765
25	425,184			(150,277)		274,907	3,251,672
	$7,267,307		**$708,807**	**($1,543,528)**	**($3,180,914)**	**$3,251,672**	
	total utility savings	|------total incentives------|		net tax effects	finance payments	**SOLAR CASH BENEFIT**	

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MISSION CAPITAL

Solar Financing for

Business Services

Coastal location
Schedule A10

cost per Watt	**$3.15**
kWh/yr per kW	**1317**
avg savings/kWh	**$0.148**

payback = 14.2 yrs

SYSTEM OVERVIEW

System size, kW DC		750.000
First year output, kWh		987,655
Equipment cost		$2,362,689
First year utility savings		$145,849
Annual savings increase		4.00%
Federal tax credit	30%	$708,807

FINANCING SUMMARY

Amount to finance	$2,362,689
Initial investment	none
Solar tax benefits go to	Lessee
Term (months)	168
Monthly lease payment	$21,027
Balloon pmt	none

CASH FLOW ANALYSIS

year	savings on utilities	rebates, grants	federal tax credit	other tax effects	finance payments	net annual cash flow	cumulative savings
1	$145,849		$708,807	$146,254	($252,328)	$748,581	$748,581
2	150,925			230,281	(252,328)	128,877	877,459
3	156,177			131,599	(252,328)	35,447	912,906
4	161,612			70,344	(252,328)	(20,373)	892,533
5	167,236			65,366	(252,328)	(19,726)	872,807
6	173,056			17,783	(252,328)	(61,489)	811,318
7	179,078			(30,142)	(252,328)	(103,392)	707,926
8	185,310			(33,349)	(252,328)	(100,367)	607,559
9	191,759			(33,560)	(252,328)	(94,130)	513,429
10	198,432			(33,718)	(252,328)	(87,615)	425,814
11	205,337			(72,574)	(252,328)	(119,565)	306,249
12	212,483			(75,100)	(252,328)	(114,945)	191,304
13	219,877			(77,713)	(252,328)	(110,164)	81,140
14	227,529			(80,418)	(252,328)	(105,217)	(24,077)
15	235,447			(83,216)		152,231	128,154
16	243,641			(86,112)		157,528	285,682
17	252,119			(89,109)		163,010	448,692
18	260,893			(92,210)		168,683	617,376
19	269,972			(95,419)		174,553	791,929
20	279,367			(98,740)		180,628	972,556
21	289,089			(102,176)		186,914	1,159,470
22	299,149			(105,731)		193,418	1,352,888
23	309,560			(109,411)		200,149	1,553,037
24	320,333			(113,218)		207,114	1,760,151
25	331,480			(117,158)		214,322	1,974,473
	$5,665,709		**$708,807**	**($867,450)**	**($3,532,593)**	**$1,974,473**	
	total utility savings	|------total incentives------|		net tax effects	finance payments	**SOLAR CASH BENEFIT**	

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MISSION CAPITAL	Solar Financing for **Food Processor** Inland location Schedule A6		
		cost per Watt	$3.00
		kWh/yr per kW	1511
		avg savings/kWh	$0.249
		payback =	**5.6 yrs**

SYSTEM OVERVIEW

System size, kW DC		140.000
First year output, kWh		211,587
Equipment cost		$420,390
First year utility savings		$52,620
Annual savings increase		4.00%
Federal tax credit	30%	$126,117

FINANCING SUMMARY

Amount to finance	$420,390
Initial investment	none
Solar tax benefits go to	Lessee
Term (months)	60
Monthly lease payment	$8,087
Balloon pmt	none

CASH FLOW ANALYSIS

year	savings on utilities	rebates, grants	federal tax credit	other tax effects	finance payments	net annual cash flow	cumulative savings
1	$52,620		$126,117	$15,616	($97,043)	$97,311	$97,311
2	54,451			29,060	(97,043)	(13,532)	83,779
3	56,346			9,911	(97,043)	(30,785)	52,994
4	58,307			(2,666)	(97,043)	(41,401)	11,592
5	60,336			(5,322)	(97,043)	(42,028)	(30,436)
6	62,436			(14,521)		47,914	17,479
7	64,608			(22,835)		41,773	59,252
8	66,857			(23,630)		43,227	102,479
9	69,183			(24,452)		44,731	147,210
10	71,591			(25,303)		46,288	193,498
11	74,082			(26,184)		47,899	241,397
12	76,660			(27,095)		49,566	290,962
13	79,328			(28,038)		51,290	342,253
14	82,089			(29,013)		53,075	395,328
15	84,946			(30,023)		54,922	450,251
16	87,902			(31,068)		56,834	507,084
17	90,961			(32,149)		58,812	565,896
18	94,126			(33,268)		60,858	626,754
19	97,402			(34,426)		62,976	689,730
20	100,791			(35,624)		65,168	754,898
21	104,299			(36,863)		67,435	822,333
22	107,928			(38,146)		69,782	892,115
23	111,684			(39,474)		72,211	964,326
24	115,571			(40,847)		74,724	1,039,049
25	119,593			(42,269)		77,324	1,116,373
	$2,044,098		**$126,117**	**($568,629)**	**($485,213)**	**$1,116,373**	
	total utility savings	|------total incentives------|		net tax effects	finance payments	**SOLAR CASH BENEFIT**	

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MISSION CAPITAL

Solar Financing for

Food Processor

Inland location
Schedule A10

cost per Watt	**$3.00**
kWh/yr per kW	**1511**
avg savings/kWh	**$0.148**
payback =	**10.7 yrs**

SYSTEM OVERVIEW

System size, kW DC		140.000
First year output, kWh		211,587
Equipment cost		$420,390
First year utility savings		$31,367
Annual savings increase		4.00%
Federal tax credit	30%	$126,117

FINANCING SUMMARY

Amount to finance	$420,390
Initial investment	none
Solar tax benefits go to	Lessee
Term (months)	120
Monthly lease payment	$4,716
Balloon pmt	none

CASH FLOW ANALYSIS

year	savings on utilities	rebates, grants	federal tax credit	other tax effects	finance payments	net annual cash flow	cumulative savings
1	$31,367		$126,117	$24,112	($56,598)	$124,998	$124,998
2	32,459			38,719	(56,598)	14,580	139,578
3	33,588			20,795	(56,598)	(2,214)	137,364
4	34,757			9,509	(56,598)	(12,332)	125,032
5	35,967			8,212	(56,598)	(12,419)	112,613
6	37,218			(690)	(56,598)	(20,069)	92,544
7	38,513			(9,680)	(56,598)	(27,764)	64,780
8	39,854			(11,205)	(56,598)	(27,949)	36,831
9	41,241			(12,814)	(56,598)	(28,171)	8,660
10	42,676			(14,514)	(56,598)	(28,436)	(19,776)
11	44,161			(15,608)		28,553	8,777
12	45,698			(16,151)		29,546	38,323
13	47,288			(16,713)		30,574	68,897
14	48,934			(17,295)		31,638	100,536
15	50,636			(17,897)		32,739	133,275
16	52,399			(18,520)		33,879	167,154
17	54,222			(19,164)		35,058	202,212
18	56,109			(19,831)		36,278	238,490
19	58,062			(20,521)		37,540	276,030
20	60,082			(21,235)		38,847	314,876
21	62,173			(21,974)		40,199	355,075
22	64,337			(22,739)		41,597	396,672
23	66,575			(23,530)		43,045	439,718
24	68,892			(24,349)		44,543	484,261
25	71,290			(25,197)		46,093	530,354
	$1,218,495		**$126,117**	**($248,283)**	**($565,976)**	**$530,354**	
	total utility savings	|------total incentives------|		net tax effects	finance payments	**SOLAR CASH BENEFIT**	

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MISSION CAPITAL

Solar Financing for

Food Processor

Coastal location
Schedule A6

cost per Watt	$3.15
kWh/yr per kW	1298
avg savings/kWh	$0.239

payback = 7.5 yrs

SYSTEM OVERVIEW

System size, kW DC		140.000
First year output, kWh		181,680
Equipment cost		$441,410
First year utility savings		$43,396
Annual savings increase		4.00%
Federal tax credit	30%	$132,423

FINANCING SUMMARY

Amount to finance	$441,410
Initial investment	none
Solar tax benefits go to	Lessee
Term (months)	84
Monthly lease payment	$6,416
Balloon pmt	none

CASH FLOW ANALYSIS

year	savings on utilities	rebates, grants	federal tax credit	other tax effects	finance payments	net annual cash flow	cumulative savings
1	$43,396		$132,423	$20,878	($76,995)	$119,702	$119,702
2	44,906			35,701	(76,995)	3,612	123,313
3	46,469			16,341	(76,995)	(14,185)	109,128
4	48,086			3,924	(76,995)	(24,986)	84,142
5	49,759			1,967	(76,995)	(25,269)	58,874
6	51,491			(8,005)	(76,995)	(33,509)	25,364
7	53,283			(18,100)	(76,995)	(41,812)	(16,448)
8	55,137			(19,488)		35,650	19,202
9	57,056			(20,166)		36,890	56,092
10	59,042			(20,868)		38,174	94,266
11	61,096			(21,594)		39,502	133,768
12	63,222			(22,345)		40,877	174,645
13	65,422			(23,123)		42,300	216,945
14	67,699			(23,928)		43,772	260,716
15	70,055			(24,760)		45,295	306,011
16	72,493			(25,622)		46,871	352,882
17	75,016			(26,514)		48,502	401,384
18	77,626			(27,436)		50,190	451,574
19	80,328			(28,391)		51,937	503,511
20	83,123			(29,379)		53,744	557,255
21	86,016			(30,401)		55,614	612,869
22	89,009			(31,459)		57,550	670,419
23	92,107			(32,554)		59,552	729,971
24	95,312			(33,687)		61,625	791,596
25	98,629			(34,859)		63,769	855,366
	$1,685,778 total utility savings	|------total incentives------|	**$132,423**	**($423,868)** net tax effects	**($538,968)** finance payments	**$855,366** SOLAR CASH BENEFIT	

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MISSION CAPITAL

Solar Financing for
Food Processor
Coastal location
Schedule A10

cost per Watt	$3.15
kWh/yr per kW	1298
avg savings/kWh	$0.148

payback = 14.6 yrs

SYSTEM OVERVIEW

System size, kW DC		140.000
First year output, kWh		181,680
Equipment cost		$441,410
First year utility savings		$26,829
Annual savings increase		4.00%
Federal tax credit	30%	$132,423

FINANCING SUMMARY

Amount to finance	$441,410
Initial investment	none
Solar tax benefits go to	Lessee
Term (months)	168
Monthly lease payment	$3,987
Balloon pmt	none

CASH FLOW ANALYSIS

year	savings on utilities	rebates, grants	federal tax credit	other tax effects	finance payments	net annual cash flow	cumulative savings
1	$26,829		$132,423	$27,853	($47,842)	$139,263	$139,263
2	27,763			43,547	(47,842)	23,467	162,730
3	28,729			25,103	(47,842)	5,990	168,721
4	29,729			13,651	(47,842)	(4,463)	164,258
5	30,763			12,710	(47,842)	(4,369)	159,890
6	31,834			3,807	(47,842)	(12,201)	147,689
7	32,941			(5,162)	(47,842)	(20,063)	127,626
8	34,088			(5,753)	(47,842)	(19,507)	108,119
9	35,274			(5,750)	(47,842)	(18,318)	89,801
10	36,502			(5,734)	(47,842)	(17,075)	72,726
11	37,772			(13,350)	(47,842)	(23,420)	49,306
12	39,086			(13,815)	(47,842)	(22,570)	26,735
13	40,447			(14,295)	(47,842)	(21,691)	5,044
14	41,854			(14,793)	(47,842)	(20,781)	(15,736)
15	43,311			(15,308)		28,003	12,266
16	44,818			(15,840)		28,977	41,244
17	46,377			(16,392)		29,986	71,230
18	47,991			(16,962)		31,029	102,259
19	49,662			(17,552)		32,109	134,368
20	51,390			(18,163)		33,227	167,595
21	53,178			(18,795)		34,383	201,978
22	55,029			(19,449)		35,579	237,557
23	56,944			(20,126)		36,818	274,374
24	58,925			(20,827)		38,099	312,473
25	60,976			(21,551)		39,425	351,898
	$1,042,210		**$132,423**	**($152,948)**	**($669,788)**	**$351,898**	
	total utility savings	|------total incentives------|		net tax effects	finance payments	**SOLAR CASH BENEFIT**	

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