BEFORE THE PUBLIC UTILITIES COMMISSION
OF THE STATE OF CALIFORNIA

Order Instituting Rulemaking Regarding Policies Procedures and Rules for the California Solar Initiative, the Self-Generation Incentive Program and Other Distributed Generation Issues	Rulemaking 12-11-005 (November 8, 2012)

RESPONSE OF SKYLINE INNOVATIONS, INC. ON THE PETITION SUBMITTED BY THE CSI-THERMAL PROGRAM ADMINISTRATORS AND THE CALIFORNIA SOLAR ENERGY INDUSTRIES ASSOCIATION FOR MODIFICATION OF D.12-08-008 AND D.13-08-004 REGARDING THE CSI-THERMAL PROGRAM

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Skyline Innovations, Inc. ("Skyline" or "Skyline Innovations") hereby submits these comments to the California Public Utilities Commission ("Commission") in response to the July 23, 2014 petition filed by the CSI-Thermal Program Administrators ("PAs") and the California Solar Energy Industries Association ("CALSEIA") to modify D.12-08-008 and D.13-08-004 regarding the CSI-Thermal Program ("Petition").

I. Background – Skyline Innovations

Skyline Innovations is the nation's largest financer and developer of solar water heating systems. Our services include building, operating and maintaining those systems while guaranteeing our customers' savings by providing a fixed discount to their utility rates for water heating through a power purchase agreement. This is done at no upfront cost to our customers. Skyline Innovations has attracted over $50 million in investor financing to-date that serves as the foundation for a business model that minimizes risk to the customer. WGL Holdings, the parent company of Washington Gas, a natural gas utility in the mid-Atlantic United States, is Skyline's largest investment partner; a relationship that started in 2011 with a $30 million tax equity fund dedicated to solar

thermal system financing. Headquartered in Washington, DC, Skyline also has offices in Los Angeles, San Diego, and Puerto Rico.

Created in 2009, Skyline has installed over 150 commercial-scale solar water heating systems across all domestic markets, including 17 in California, as of August 2014. Skyline expanded into California in 2011, is currently a portfolio company within the Los Angeles Cleantech Incubator in downtown Los Angeles, and is a member of CALSEIA. The typical Skyline system is installed on multifamily buildings, heating residents' domestic hot water supply. Skyline participates in the California Solar Initiative Thermal Program ("CSI-Thermal") in all three service territories. All of Skyline's systems in California have so far been installed on low-income multifamily buildings. Skyline's solar water heating pipeline for the next year, which includes projects in various design, engineering, and installation phases, totals another approximately 50 commercial-scale projects in California.

II. Skyline Supports Recommendations in the Petition

Skyline fully supports all the recommendations detailed in the Petition jointly filed by CALSEIA and the PAs. The keys to any successful incentive program, in Skyline's experience, is that the program structure creates clear rules, predictable market expectations, and affects system economics to the point where it can facilitate system development. The natural gas program in CSI-Thermal has not yet offered incentive rates high enough to overcome the market barriers impeding mainstream adoption of solar thermal technologies. The low participation rates throughout all the programs illustrate that fact clearly. Skyline has only participated in the low-income subprogram for this reason, and not for a lack of interest in other types of projects.

Regarding the solar pools program in CSI-Thermal, setting a separate incentive budget for solar pools creates greater predictability in the market for domestic water heating developers and solar pool companies and this greatly increases the likelihood financing options will enter the market. Each must work with different variations of solar thermal technologies and separate system economics. CSI-Thermal program structure should reflect that.

In these comments, Skyline would like to provide the perspective of a solar thermal company on why the Petition's recommendations should be accepted and applied in full. Skyline currently offers its solar thermal services in Maryland, Delaware, California, Hawaii, the District of Columbia, and Puerto Rico. Particularly on the east coast, Skyline has first-hand knowledge of the dynamics in young, immature solar thermal markets. These comments are meant to share those experiences as it pertains to the Petition and the ability of CSI-Thermal to meet its legislatively mandated goals and facilitate the development of market based tools similar to those that lead to the growth of the California PV industry.

III. Market Barriers in the Solar Thermal Industry

Through Skyline's experience in California (as well as our extensive experience in developing other solar thermal markets), we have identified two primary market barriers hindering development of the solar thermal industry:

1. First Costs. Consumers lack the capital needed to invest in solar thermal systems, or they are unwilling to hold a long-term asset on their balance sheet.
2. Consumer Risk. Consumers' lack of a desire to adopt a technology without fully understanding the technological and financial risk of owning a solar thermal system.

As the below graphic indicates, the top barriers to energy efficiency and renewable energy remain the availability of capital, consumer credit, and risk assessment. For example, consumers generally lack the desire to make an investment in energy efficiency and renewable energy when they do not fully understand the financial returns, or have clear expectations of future energy bill savings. There are additional perceived risks when the consumer lacks the technical undertaking of the assets or improvements to move ahead with the financial commitment. Simply put, there is an information gap. It is not impossible to overcome, as has been done successfully with other renewable energy technologies.

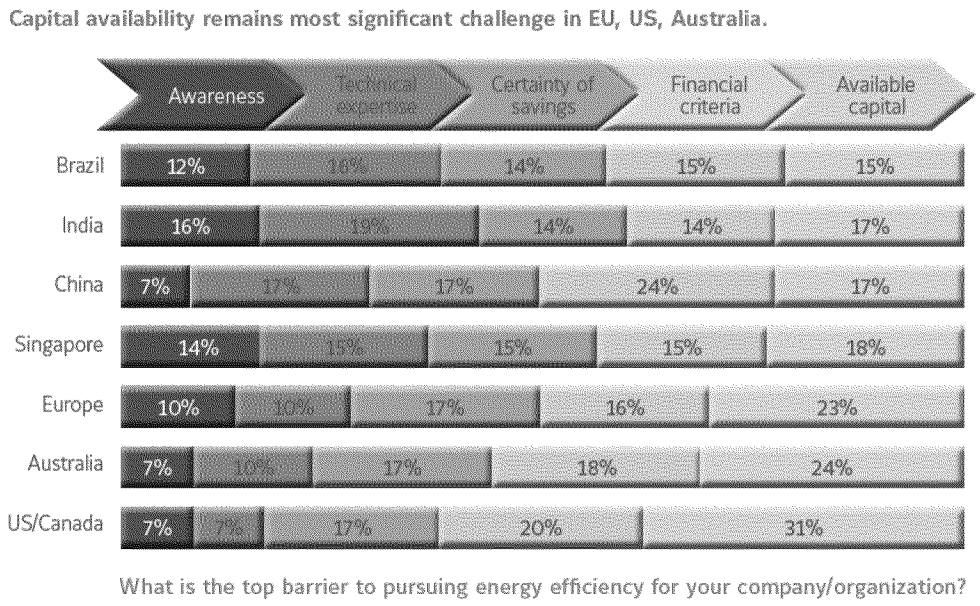


Figure 1: Top International Barriers to Energy Efficiency. (Source: "2013 Energy Efficiency Indicator Survey". Institute for Building Efficiency. p.17)

As California experienced with the solar PV market, financing options can largely help overcome these market barriers. Financing options are currently extremely limited in the solar thermal market for two primary reasons:

1. Installation costs are too high for financiers to earn a competitive return, and
2. Solar thermal systems are largely unknown assets in the capital markets; therefore, investors perceive higher risk and demand a high cost of capital.

The current market instability, and lack of system deployment, is keeping project investors on the sidelines while also causing system prices to remain high due to high margin across the solar thermal supply chain. Solar water heating systems are largely an unknown financial investment, with little recorded performance data. This increases its perceived risk, which is reflected in high costs of capital. The solar PV industry faced much of the same obstacles throughout the 2000s.

Consider how low installation costs must be in order for developers to break even or make a profit. The financial returns to a project developer are determined by three primary factors:

1. Total project costs, including the cost of capital,
2. Fuel prices (i.e. the value of energy displaced), and
3. Incentives.

The table[1] below shows the financial returns to solar thermal systems for different costs of capital and fuel prices, given today's incentive rates of $14.53 per therm. The table shows that developers have to install systems for less than $100 per square foot, and closer to $80 at current gas prices and capital cost rates (which remain high due to financiers' lack of familiarity with solar thermal technologies). Installers are unable to do projects at these rates due to the poor labor efficiencies that are unavoidable with low project flow.

Table 1: Comparing Cost of Capital with Current Build Prices at $14.53 per therm CSI-Thermal Incentive

Year	Natural Gas ($/therm)	Cost of Capital 7%	10%	12%	15%
2012 (Delivered Industrial Price)	**$0.58**	$79	$74	$72	$69
2012 (Delivered Commercial Price)	**$0.71**	$83	$78	$75	$71
2011 (Delivered Commercial Price)	**$0.83**	$86	$81	$78	$74
Feb 2014 (Delivered Commercial Price)	**$0.92**	$91	$85	$82	$78
2008 (Delivered Commercial Price)	**$1.18**	$97	$90	$87	$82
N/A	**$1.25**	$100	$95	$91	$86
		Installed Cost ($/ Sq Ft)			

According to data from the CSI-Thermal quarterly progress reports, the market is currently capable of installation costs – also referred to as build prices – only as low as $107 per square foot of collector area. In Skyline's experience, many installers are much closer to $125 per square foot.

This means that even with the most aggressive assumptions about capital cost and fuel prices, current incentive rates are not sufficient to bring developers into the market. This is indicated by the red shading in Table 1. The CSI-Thermal program exists to help overcome initial market barriers by spurring market growth resulting in increased deployment volume, and decreased installed cost, but the current incentive level falls short of what is required.

[1] In order to calculate cost of capital, figure assumes a power purchase agreement length of 15 years with a 1.5% annual escalator, 35% tax rate, 30% Federal Income Tax Credit, 30,000 BTUs per collector per day, and 82% gas water heating efficiency rating. Natural Gas prices derived from The U.S. Energy Information Administration's (EIA) California delivered price data.
http://www.eia.gov/dnav/ng/ng_pri_sum_dcu_SCA_m.htm

As noted previously, the cost of project capital is currently high for solar thermal technologies, but through a critical mass of deployments, financiers will become more familiar and increasingly comfortable with solar thermal technologies and their return profiles – this will result in a reduction in the cost of capital enabling more projects to be financed. This cycle will result in more solar thermal systems deployed at a lower total installed price, and requiring less public support through the CSI-Thermal Program over time. This is the well-known story of the solar PV industry. With the program recommendations made by the PAs and CALSEIA in the Petition, it can be the story of the solar thermal industry as well.

IV. Benefits of Petition Recommendations

The current proposal to increase the multifamily/commercial rate to $20.19 per therm will enable solar water heating systems to be cost competitive with current natural gas prices. This will pave the way for CSI-Thermal to move towards achieving one of its core goals – facilitating mainstream adoption of solar water heating technologies in California. At this level, Skyline estimates project deployment of $15-20 million in solar thermal assets in the 12 months following the increase of the multifamily/commercial rate to $20.19 per therm.

Additionally, the market will likely see more developers and financiers enter the market and establish the necessary relationships with installer partners and begin to drive installed prices down. More competition in the market will both reduce installed system prices as well as the cost of capital; however, in order to achieve this a significant increase in today's incentive is needed, specifically for the market-rate multifamily commercial project class.

Table 2, below, is built off of Table 1 but this time compares the ability for solar thermal developers to finance multifamily and commercial solar thermal systems when the CSI-Thermal incentive is $21 per therm.

The red areas show that in some cases, high capital costs and low gas prices will prevent returns from exceeding the $107 per square foot installation cost benchmark. The yellow areas indicate build prices that are possible to finance, close to the breakeven

point for developers and financiers. The green shaded installation prices represent projects that earn financing and achieve acceptable returns for investors.

Table 2: Comparing Cost of Capital with Current Build Prices at $21.00 per therm CSI-Thermal Incentive					
Year	**Natural Gas ($/therm)**	**Cost of Capital**			
		7%	**10%**	**12%**	**15%**
2012 (Delivered Industrial Price)	**$0.58**	$107	$102	$100	$97
2012 (Delivered Commercial Price)	**$0.71**	$111	$106	$104	$99
2011 (Delivered Commercial Price)	**$0.83**	$115	$109	$107	$102
Feb 2014 (Delivered Commercial Price)	**$0.92**	$118	$112	$109	$104
2008 (Delivered Commercial Price)	**$1.18**	$126	$119	$115	$110
N/A	**$1.25**	$128	$121	$117	$112
		Installed Cost ($/ Sq Ft)			

At the assumed build price of $107 per square foot many projects would present a positive financial return. At this incentive level projects will be deployed in volume, which will lead to declines in the cost of capital and ultimately to install costs below $100 per square foot. This incentive level will create a robust solar thermal market in California and put the industry on a path to stability beyond CSI-Thermal.

It should be noted that CSI-Thermal program data dovetails with Skyline's general assessment. This is outlined both in the Petition, but also the January 2014 analysis from the Energy Division staff at the Commission.[2] The low-income program has attracted substantial interest, while the overall program is barely one-quarter towards its goals. Skyline's own business decisions reflect that of the industry at-large. We expanded California staff at the beginning of 2013 to increase project management and sales capacities and currently have 17 low-income multifamily systems installed and operating as part of CSI-Thermal. Additionally, we have another 50 systems for low-income buildings in the installation or engineering design phases. Should market rate multifamily and commercial projects be eligible for a similar incentive rate, success rates should mirror those of the low-income sub-program. Likewise, the benefit of a thriving market-rate program class will have an enormous positive impact on the CSI-Thermal

[2] California Public Utilities Commission, "Review of the Incentive Levels and Progress of the California Solar Initiative-Thermal Program," January 29, 2014.

program overall; increased deal flow coupled with financeable project economics will attract project investors into the market and, again, the cost of capital will start to decline.

Skyline is not choosing to solely focus on low-income systems, but the current low-income incentive level of $19.23 per therm allows projects to hit their required return given today's natural gas prices. Additionally, our dependency on the low-income market is hindering our ability to attract additional project investors to California – even for low-income multifamily projects – because most investors perceive the market to not have comparable returns to other possible investment opportunities. Making market-rate systems economically viable will significantly increase CSI-Thermal spend rates and project installation rates. Financiers will quickly become interested in the market, and installed costs will decrease to a level enabling systems to be financed.

V. The Role of Financing in Facilitating Efficiencies

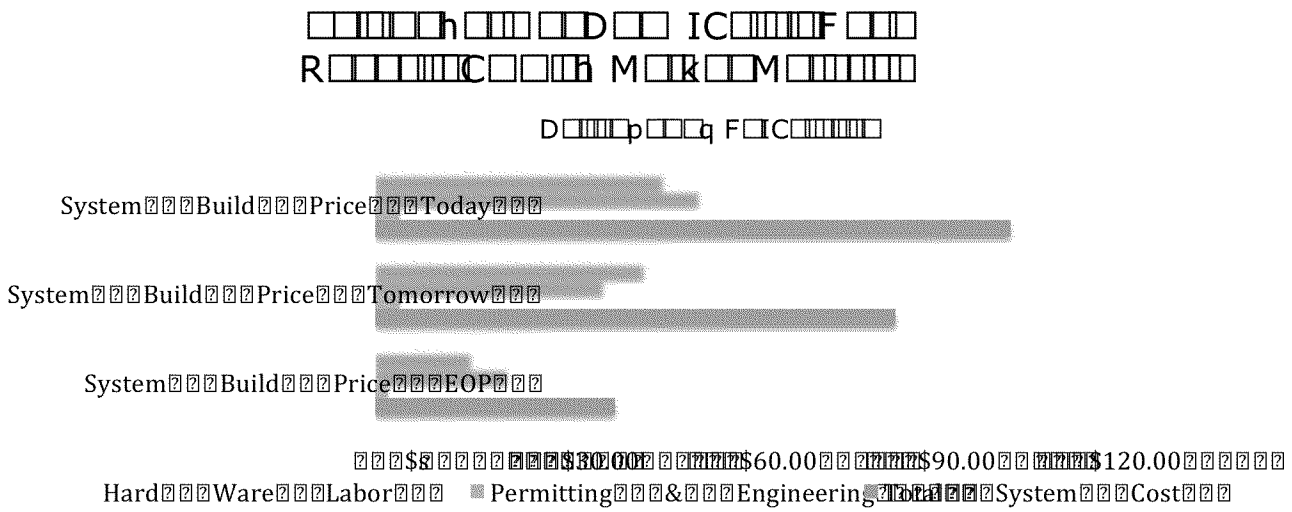
While financing options entering the market is not the end goal, Skyline believes it is an important means to the end. A noteworthy metric of nearly any maturing industry is financing options becoming available to consumers. Whether it's automobiles, housing, television and audio equipment, or energy sources such as photovoltaics, financing is a critical indicator that the market is moving in the right direction. Unfortunately, the CSI-Thermal program is currently not on this track and if action is not taken soon to correct this, we believe the program could actually move backwards in this regards, primarily because if the current low adoption rates persist, investors will choose to turn away from the California solar thermal market.

Skyline emphatically believes that without financing options entering California's solar thermal market, the CSI-Thermal program will not be successful. It is our belief that financing options – even if system financing is focused on a particular market segment or project class at first – will benefit the industry as a whole in the long run. As previously mentioned, financing will help enable the industry to overcome the current market barriers, which will increase the system deployment rate and reduce installed costs, which Skyline has experienced in other markets.

Furthermore, as the market begins to warm and capital starts flowing, market participants, especially manufacturers, will start reinvesting in their business, catalyzing

research and development and enabling manufacturers to launch new products. New, innovative solar thermal products have the potential to dramatically decrease system costs, allowing the market to thrive well beyond the CSI-Thermal program.

The graph below shows the current installed price. Today's installed price is akin to the installed price Skyline has witnessed in other markets, such as Maryland, before the market began to mature. "System Build Price Tomorrow" demonstrates the reduction in installed prices that Skyline has witnessed in the more mature markets in which we operate. Skyline believes solar thermal technology innovation, and labor efficiencies, will provide significant cost declines in the future. Skyline is already beginning to test some of these technologies and we believe that, if successful, the CSI-Thermal program will greatly help to expedite the commercialization of these technologies and installation streamlining (as well as permit streamlining and the reduction of other soft costs).



Lastly, it is not expected that financing will immediately become available in the residential program class, but this is similar to the development in the PV industry. Before there was a SolarCity, there was a Sun Edison. Therefore, we anticipate multifamily and commercial sectors will pave the way for solar thermal system financing, but the residential market will ultimately benefit from such financing maturity in much the same way the PV residential market has developed.

VI. Conclusion

The Commission has the opportunity to develop a robust financing market for solar thermal technologies by implementing the recommendations outlined in the Petition.

The higher incentive rates and greater budget flexibility in the Natural Gas Program will put CSI-Thermal on the right track. Third-party financing has been a crucial component of the mainstream adoption of solar PV, and PV financing modes became possible in large part because of CSI. Similarly, through the proposed incentive rates the solar thermal industry will be primed to grow and scale up in similar fashion. As the country's largest domestic solar water heating developer and financier, Skyline Innovations is ready to expand our investment into the California market.

In closing, Skyline Innovations appreciates that the CSI-Thermal Program has set the foundation for facilitating the scale up of the solar thermal industry. With some immediate alterations, we are optimistic that the market will scale, putting the program on a path to reaching the goals set forth in AB 1470. Time is of the essence and we urge the Commission to act quickly.

DATED at Washington, DC, this 22nd day of August, 2014

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