

SunCentric Business Perspectives

Will a Drop in Prices and New Federal Incentives Stimulate Demand in the California Solar Initiative and the U.S.?

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Mid July 2009 Update

It's been ten months since the Federal Investment Tax Credit (ITC) was expanded and extended, and six months since the American Recovery and Reinvestment Act of 2009 (ARRA) package arrived. It's also been ten months since the economy hit the skids.

Spain, after its wild 2.5GW ride in 2008, will have what amounts to a "lost year" in 2009 and Germany, the industry's traditional solar market leader has had a slow start. Due to the poor economy, project financing, the life blood of commercial solar has not flowed at the rate the industry requires. Investors and commercial buyers around the world, and in the U.S. are increasingly interested in solar PV systems, but are reluctant to purchase.

Now midyear, 2009 is shaping up as a year of decline for the solar industry worldwide, or at best a low growth year. Together the markets around the world have been unable to grow at a rate that overcomes this confluence of events.

Increased silicon supply and PV manufacturing capacity has led to an abundance of PV modules and declining margins. Recent informal discussion with some PV manufacturer executives leads us to believe that north of 500MW is now in storage around the world. The combination of lower PV demand and higher PV supply has caused a rapid decline in PV price.

The solar world is watching for signs that changing U.S. policy and more favorable treatment of renewables will start a major U.S. ramp up. If a ramp is going to happen in the near term, California will be the leading indicator. California is at least five years ahead of most of the other states, has more sales and installation capacity than the rest of the U.S. combined and a clear understanding of the financial magic required to get solar deals done.

Against this backdrop, we wondered whether we could find convincing evidence in the California Solar Initiative (CSI) database that price has or is dropping and demand is changing. If there are changes, where do we stand compared to the early CSI solar gold rush days when the program launched in 2007? Can we make a reasonable projections based on developing trends?

We have reported in former articles and papers that demand in the CSI has suffered because incentives declined more quickly than the industry could reduce total system cost. As shown in Table 1, from January 2007 to mid 2009, most parts of the CSI’s multi-utility, multi-customer type incentive program have had a precipitous drop. During most of this time PV module cost,

Table 1 – Change in CSI Incentives from January 2007 to June 2009

Admin	Customer Class	One Time per Watt Payment				5 Year per kWh Payment			
		Beginning Rate	Current Rate	Change	% Decline	Beginning Rate	Current Rate	Change	% Decline
PGE	Residential	\$2.50	\$1.55	\$0.95	38.0%	\$0.39	\$0.22	\$0.17	43.6%
	Commercial	\$2.50	\$1.10	\$1.40	56.0%	\$0.39	\$0.15	\$0.24	61.5%
	Gov / Non-Profit	\$3.25	\$1.85	\$1.40	43.1%	\$0.50	\$0.26	\$0.24	48.0%
SCE	Residential	\$2.50	\$1.90	\$0.60	24.0%	\$0.39	\$0.26	\$0.13	33.3%
	Commercial	\$2.50	\$1.55	\$0.95	38.0%	\$0.39	\$0.22	\$0.17	43.6%
	Gov / Non-Profit	\$3.25	\$2.30	\$0.95	29.2%	\$0.50	\$0.32	\$0.18	36.0%
CCSE	Residential	\$2.50	\$1.55	\$0.95	38.0%	\$0.39	\$0.22	\$0.17	43.6%
	Commercial	\$2.50	\$1.55	\$0.95	38.0%	\$0.39	\$0.22	\$0.17	43.6%
	Gov / Non-Profit	\$3.25	\$2.30	\$0.95	29.2%	\$0.50	\$0.32	\$0.18	36.0%

other material cost, project costs and most other business costs rose. Bureaucracy and program administration lengthened projects to the extreme. Based on previous analysis, residential projects now take about 180 days to complete and non-residential projects take 300 to 400 days to complete. Together these factors combined to make the economics difficult to impossible, constraining and slowing market development.

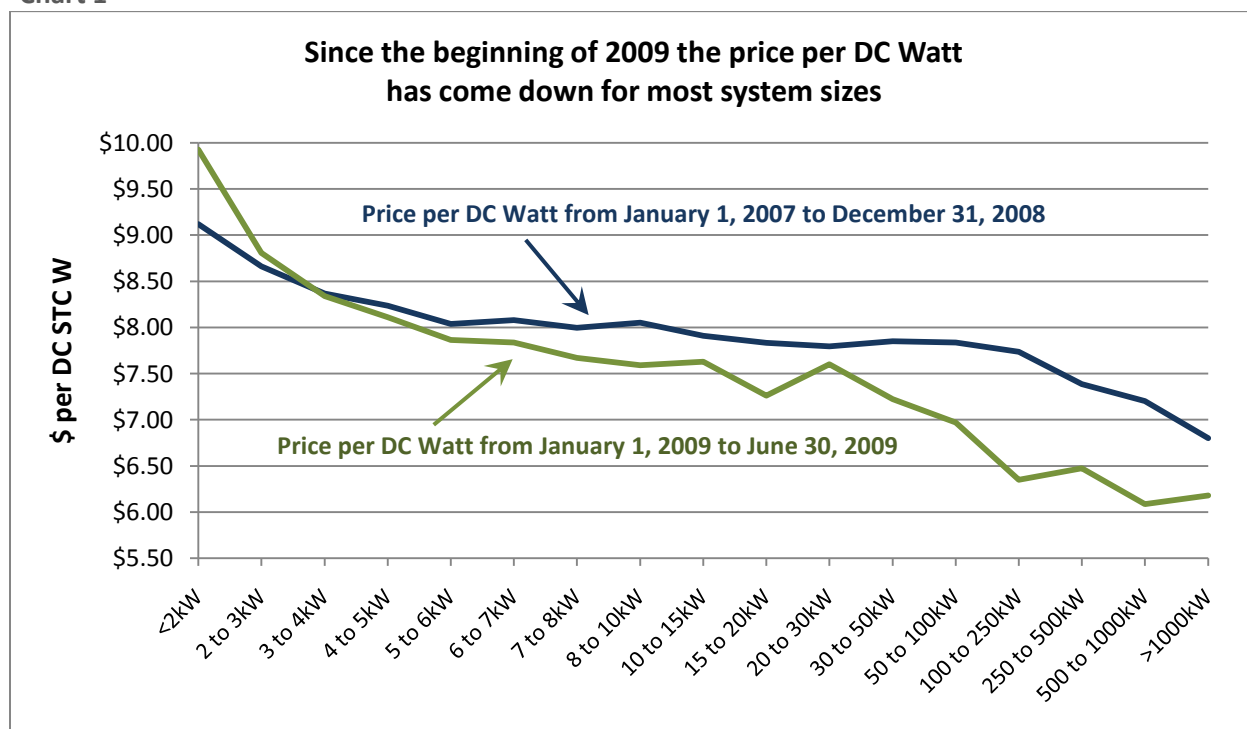
A quick word about the data used in this article. We have extracted about 23,500 projects from the July 7, 2009 CSI database for study. We captured projects that had the status of “Reservation Requests Review”, the first step for CSI projects, and a leading indicator. Due to the CSI’s program design, this data set is very dynamic and we have filtered out projects that had been cancelled or had data entry errors or omissions. We also removed significant statistical outliers. This data set gives quite reasonable accuracy for a study of price and demand at specific times, but because of project dropout rates, should not be used to estimate what projects will ultimately be completed. Also it takes some time for a project to reach Reservation Requests Review status, so the price a customer is offered appears in the CSI

database later than the offer, on the order of 30 days. We have not adjusted the data sets to correct this time lag.

Prices Changes by System Size

We first combined the Residential and Non-Residential data sets and studied the price for all projects grouped by size, Chart 1. The blue line shows pricing by size for the first two years of the program, from January 2007 through December 2008. The green line shows pricing by size from January through June 2009. This view gives a sense of the broad based movement in the market. Except for 1 to 4kW systems, the price per watt has clearly declined. Small systems may be a lagging price indicator because many installers that service this market purchase their solar products through distribution and do not receive the most current or lowest prices. It is very possible that small system prices, 1 to 4kW, might continue to go up in price over the coming months as installers try to make more profit from residential consumers who have benefited from the new 30% unlimited federal ITC. Installers and project developers who buy PV and other solar product directly from manufacturers have seen lower pricing earlier and are passing it on to their non-residential customers.

Chart 1



Based on the recent CSI residential incentive reductions at SCE, down \$0.30 per watt, and CCSE, down \$0.35 per watt, we expect that that over the coming months, smaller system price will stabilize, however the price spread will increase, particularly for systems larger than 30kW.

Price and Demand Changes in the CSI Residential Program

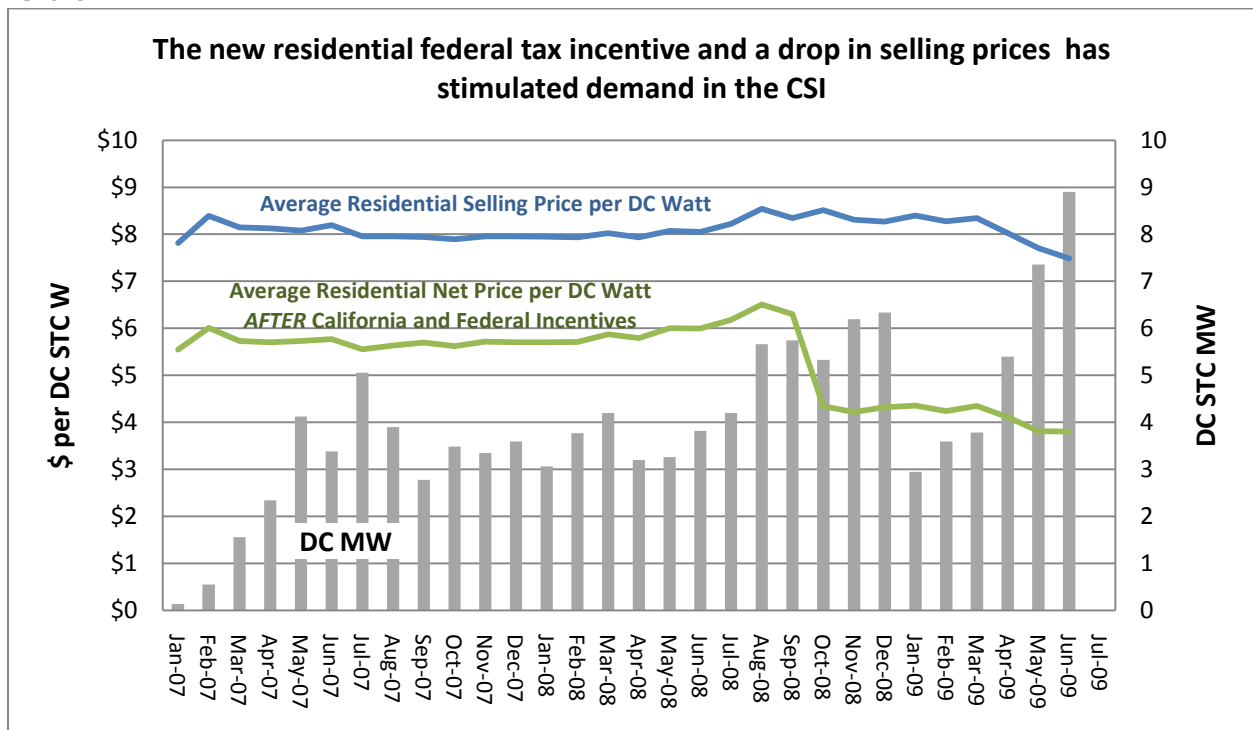
Next we studied just the residential data and averaged all prices for all system sizes. Residential system sizes range from 1kW, the lowest allowed size, to over 50kW and now average 5.5kW DC.

The Federal ITC extension passed in October 2008 replaced the \$2,000 residential tax credit cap with an *unlimited* 30% tax credit. As an example, for a \$40,000 system the ITC extension delivered a change from \$2,000 to \$12,000. Overall the new incentive is worth between \$2 and \$3 per DC watt depending on system size and system cost. This incentive easily offsets the recent and expected \$0.30 to \$0.45 per watt reductions in CSI incentives.

In recent months, the installation community has also started to pass along some of their cost reductions in PV modules and other materials to their larger residential customers.

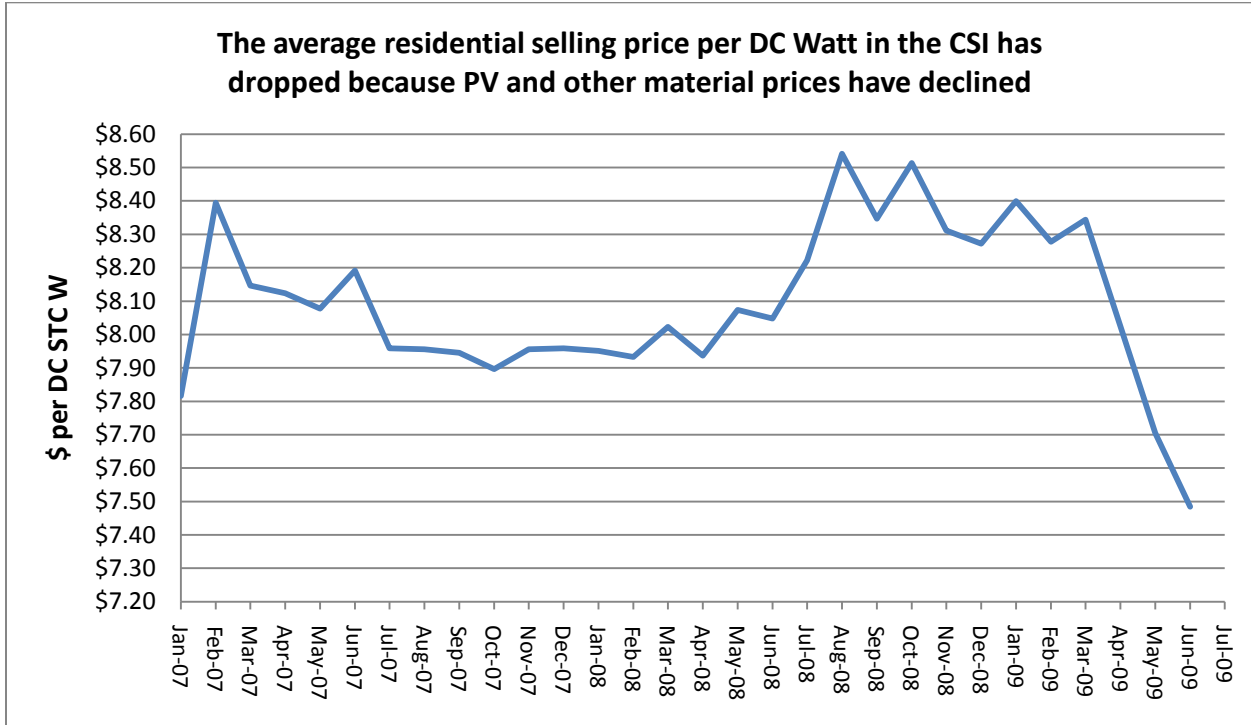
Chart 2 shows that when price reductions offered by the industry (blue line) are combined with the new federal tax credit, residential consumers have had a radical price drop. Since October 2008 the residential net price has declined from mid to high \$5 per watt to about \$4 per watt (green line). And as shown in DC MW (gray bars) consumers are buying. You can see the volume building and the 8.9MW record in June 2009 is great news. As you would expect it has taken some time for momentum to build at this new lower price level, but despite falling house values and credit issues, those with financial means are finding ways to buy a solar system.

Chart 2



In a more detailed view of residential system price, Chart 3, residential solar businesses have started passing through a good portion of their recent PV module and other material cost reductions. Our discussions with installers confirm that customers with federal tax liability are jumping at the opportunity. At the same time installers are increasing their operating profits. This is very positive news for California's consumers and the residential installation businesses.

Chart 3



For the rest of 2009 we expect prices in the residential market to stabilize as installers learn what new selling price range maximizes their sales and profits. The new consumer net price levels have expanded the market and we believe that demand will continue to grow. So far this year there has been 32 DC MW of new reservation requests and our current estimate is that the 2009 total will be 68 to 73 DC MW. This compares to 55 DC MW in 2008, and if it happens, will be an impressive increase considering all the dynamics in the marketplace and the economy. Remember, this is not a projection for completed installations. Residential projects take about 180 days to complete, so many of these projects will not be finished until 2010.

Price and Demand Changes in the CSI Non-Residential Program

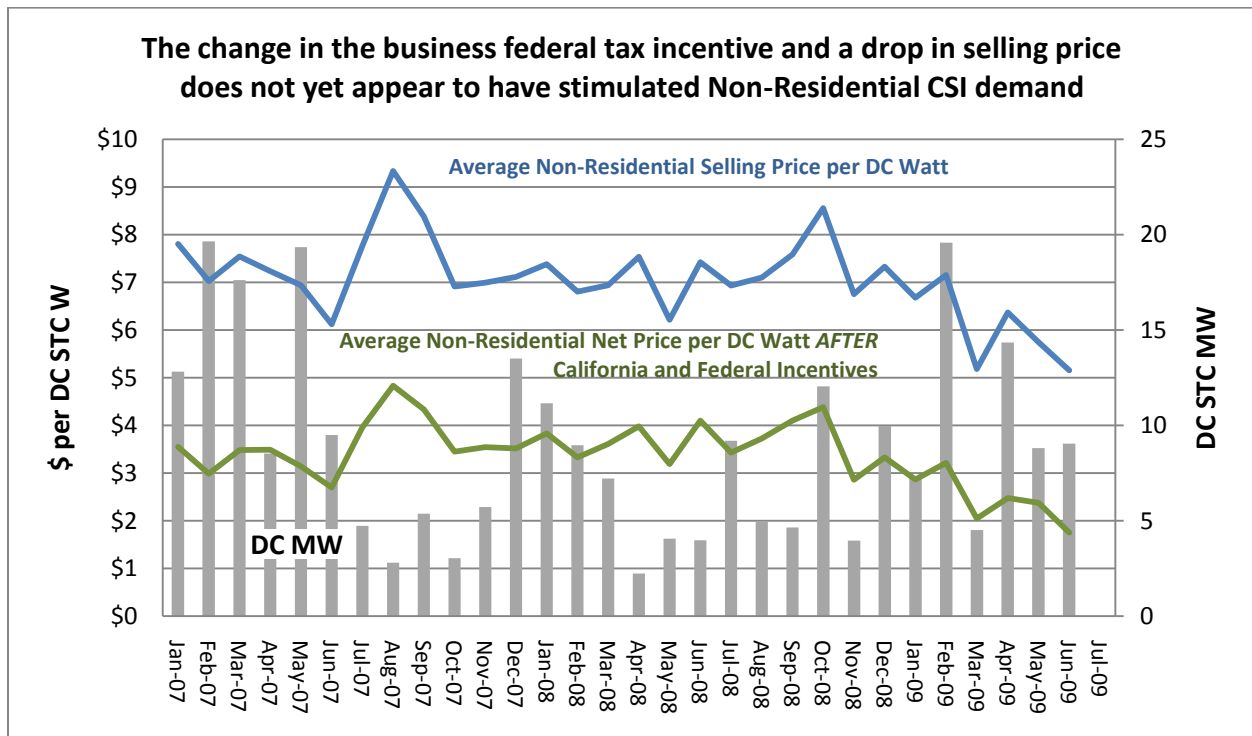
The Non-Residential data in the CSI includes non-profit, government and commercial projects, and for this study we averaged all prices for all system sizes. Non-Residential system sizes range from 1kW, the smallest size allowed to over 1MW, although by rule no incentive is paid for the portion of the system above 1MW. Today, the average Non-Residential system is about 200kW.

The relationship between price and demand is not so black and white in the Non-Residential program. The new federal program changed the way the 30% ITC is calculated and increases the tax benefit for traditional-for-profit businesses and power purchase providers.

Using the old Federal ITC method a system owner reduced the total system cost by the amount of state incentives and then calculated the 30% ITC. In the new federal ITC program the system owner can take the 30% ITC on the total system cost. The value of this new benefit depends on the CSI incentive rate, California state tax treatment, and other factors, but we estimate the maximum current value of this additional benefit is \$0.33 to \$0.47 per DC watt. This federal increase offsets the recent and shortly expected reductions in CSI incentives, so in sum there is no significant reduction for potential commercial solar customers.

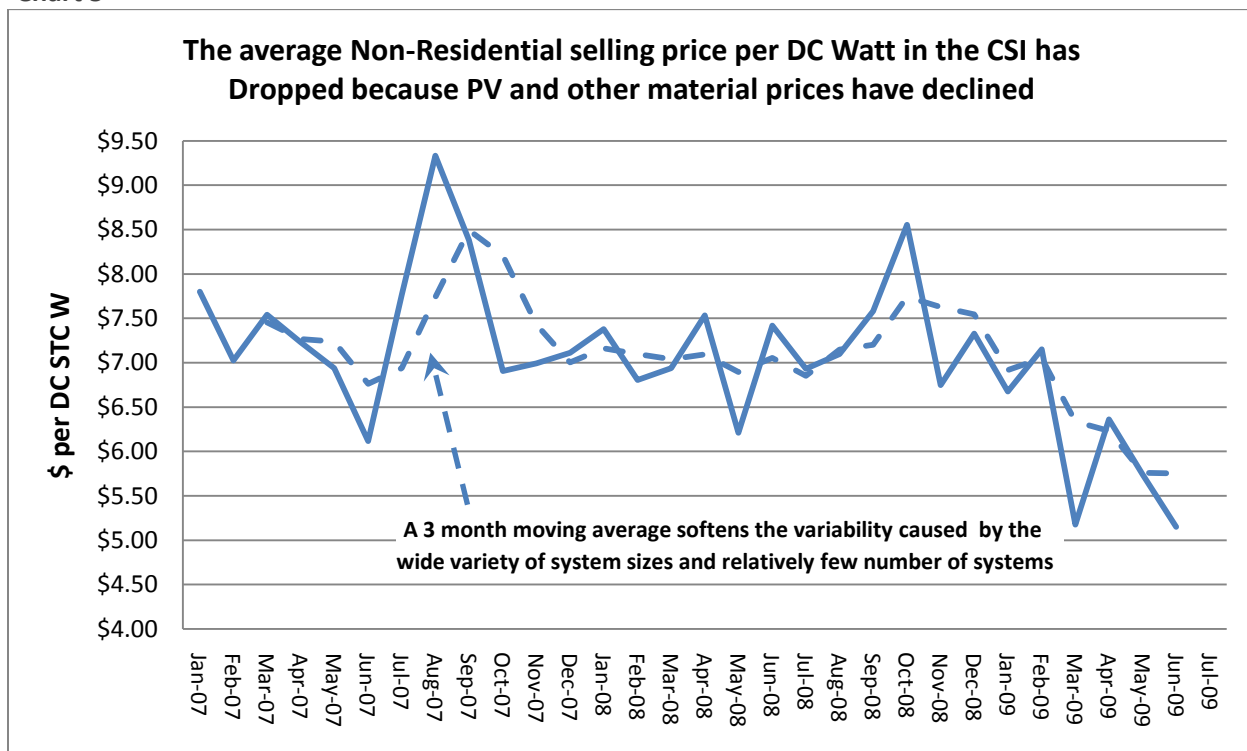
Chart 4, which combines Non-Residential systems of all sizes, shows that in Q4 08 commercial solar installers started to reduce their selling price (blue line). As a result Non-Residential net prices have fallen more than \$1.50 per watt (green line). MW of reservation requests have grown this year through June to 64MW compared to 38MW in 2008, a good sign. But from January to June of 2007, there was 87MW of demand. During this time incentives were at their highest, and net prices were above today's net prices. The poor economy has reduced the number of companies able to consume the federal tax credit and there is a lack of project funds available. Also, the new Federal grant and loan guarantee programs are not fully rolled out yet.

Chart 4



Non-Residential prices, shown in Chart 5, have dropped significantly and display a high level of variability. The high variability in price each month is caused by a wide variety of system sizes from just a few kW DC to over 1MW DC of projects and a relative small number of projects. A three month moving average, the blue dashed line, softens the variability. Still, the downward glide path confirms that installers and project developers are passing through their PV and other cost changes.

Chart 5



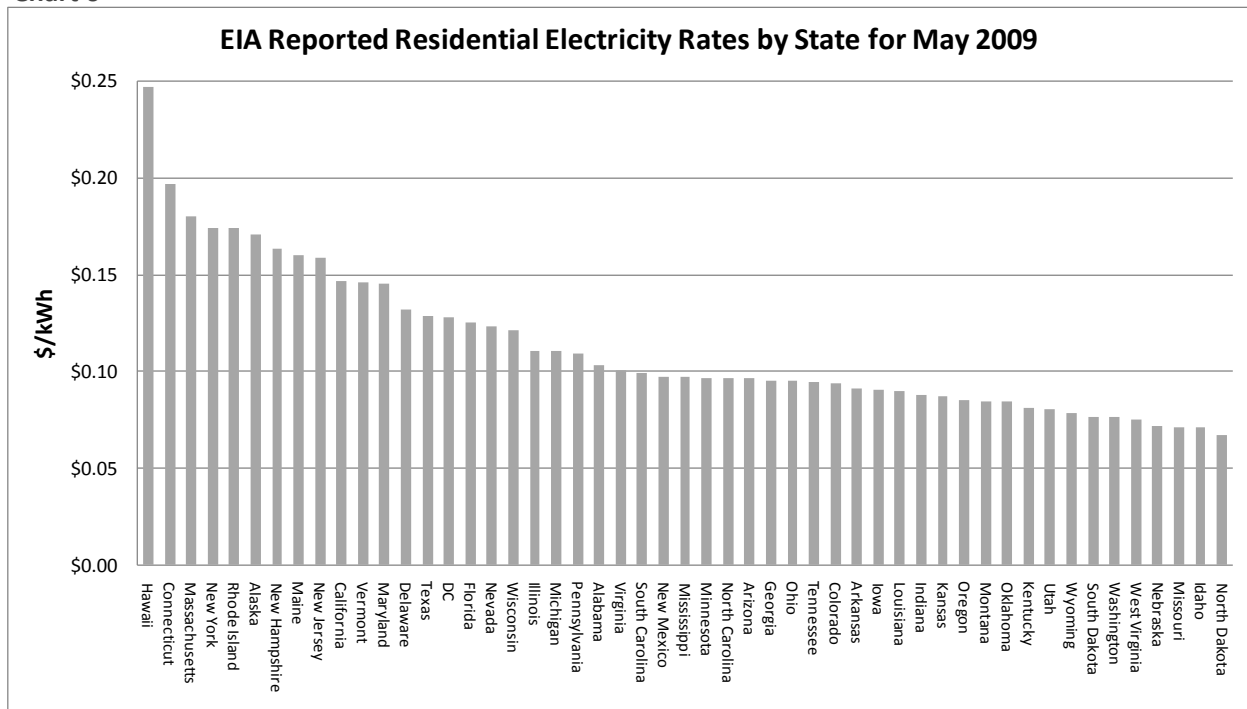
It is unclear whether non-residential demand will go up over the coming months, but we are very sure that price will continue to decline, at least through 2009. Our discussions with commercial installers and PPA providers confirm high project quotation activity, but low closing rates. Demand should increase with an even lower price and the implementation of the Federal grant and loan guarantee programs. In any case due to 300 to 400 day project cycles, almost all reservations made through the rest of this year will be completed in 2010.

The Feds to the Rescue?

What can we project in the U.S. based on California’s early results with the new Federal incentives? Clearly residential tax payers got a great deal with the 30% unlimited tax credit, but most consumers buy a solar system because they get a reasonable payback on their investment. Part of the payback is built by the electricity rate and the expectation that electricity prices will

go up over time. Few states have California's high residential electricity rates or tiered rate structures. Chart 6 shows the average residential electricity rate by state as reported by the Energy Information Administration (EIA) in May 2009. Despite the 30% unlimited tax credit it is

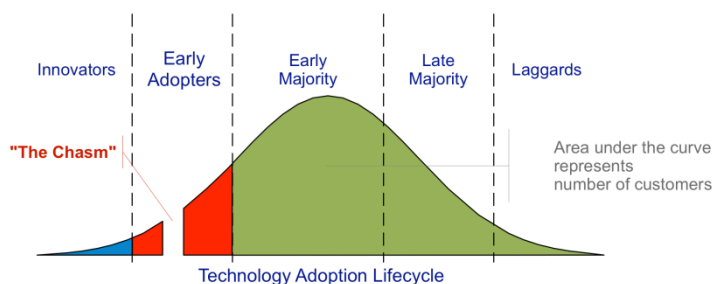
Chart 6



still likely that most states will need to add some kind of incentive to get their markets moving. Colorado, Oregon, New Jersey and other states as well as some cities and towns have programs in place, but most U.S. states do not. As California has demonstrated it can take years to design and implement an incentive program that keeps a market moving.

There is potential that residential solar will develop along the lines of Dr. Geoffrey Moore's Chasm Model. The Chasm model divides customers into specific categories. Small systems may now be low cost enough to get some innovators around the U.S. to purchase with just the Federal incentive, which on current residential system is worth \$2 to \$3. Historically these system owners are "doing the right thing" or are smitten with the technology. Moore's model suggests that about 2.5% of the population is in this group. New home construction, when the industry rebounds, may encourage this group and others by putting the cost of the solar system into the mortgage.

Figure 1 – Dr. Geoffrey Moore's Chasm Model



Commercial system owners, with few exceptions, will continue to focus on payback, when and if they have the money. California, the most progressive state, has learned over the past two years what incentives create the correct returns and make commercial system owners say, yes. Most parts of the U.S. have significantly lower commercial and industrial electricity prices than California which likely means higher incentive rates are required in those new markets. Until we get project financing back on line and get businesses back to operating with substantial profits, it is unreasonable to think that the commercial markets in the U.S. will expand rapidly.

Conclusion

What has and will be the impacts of the new Federal incentive? For existing solar markets, we expect a period of revitalization. As shown in this article, the revised federal program has the potential to roll back the clock on declining rebate structures, reversing the upward price trend and increasing demand.

We can envision “hot spots” popping up around the U.S. using just the federal program when the right factors merge. But unless there is another significant reduction in the installed price per watt, almost all parts of the U.S. will need additional local subsidies. Here, the new federal program is very valuable. In all cases, residential and commercial, the federal incentive will lower the costs to create a new local solar market. Time is the question, and based on history in the U.S. it takes years to spool up new markets. To realize the full benefit of the federal program we need to start now.

Finally, localized solar markets have proven their ability to create and grow employment. Our industry has the potential to train and re-employ people in some of the hardest hit areas during today’s challenging economic times. In California’s installation community for instance, layoffs appear to have stopped, and we expect to hear of some hiring near term. When action is taken locally, the expanded federal incentive essentially lowers the cost of job creation and can inject much needed economic stimulus on a local level. Given our collective market experience we can and should be advising our elected leaders on how to create successful, sustainable programs that deliver real jobs and real MWs.

About Us

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- Financial structures, modeling and business planning
- Government programs and their commercial impacts
- Technical and engineering support services
- Solar training and professional development
- Marketing services