

~ LEGISLATIVE NOTE: STATE OF CALIFORNIA ~

## THE CALIFORNIA SOLAR INITIATIVE: HOW MANDATORY TIME-OF-USE RATES CHILLED THE SOLAR ENERGY MARKET

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### INTRODUCTION

Governor Arnold Schwarzenegger signed the Million Solar Roofs Bill (S.B. 1) into law on August 21, 2006.<sup>1</sup> The statute, authored by Senator Kevin Murray, authorized an innovative \$3 billion performance-based incentive program designed to reduce California's dependence on fossil fuels, decrease greenhouse gas emissions, stimulate the solar industry, and provide leadership in developing alternative energy. One seemingly minor provision, however, undermined these laudable goals. The time-of-use (TOU) mandate—a small component of S.B. 1's complex set of incentives—created a billing structure that often penalized solar power users, devastating the program's early performance.

Recognizing the problem, in June 2007 the legislature temporarily suspended the TOU mandate through A.B. 1714, a band-aid bill passed solely to address S.B. 1's problematic billing structure. But A.B. 1714 simply postponed the issue for later reconsideration; the TOU mandate is scheduled to be reinstated in January 2009. Unless major changes are made to the TOU structure, S.B. 1 will be weakened yet again.

This Note explores the TOU mandate in the context of S.B. 1's two major goals: 1) encouraging solar energy; and 2) incentivizing the generation of solar energy during periods of peak energy demand. Specifically, we conclude that

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1. Press Release, Office of the Governor, Schwarzenegger Signs Legislation to Complete Million Solar Roofs Plan (Aug. 21, 2006), *available at* <http://gov.ca.gov/index.php/press-release/3588/>; S.B. 1, 2005-2006 S., Reg. Sess. (Cal. 2006).

the TOU debacle reflects the legislature's failure to thoroughly consider the interaction between the methods used to pursue the two goals.

We start with a broad narrative of S.B. 1, describing in general terms how the TOU mandate operated within the program. We then investigate the legislative history and intent of the TOU provision and examine in some detail why the TOU rate failed.

We conclude by arguing that S.B. 1's two goals are not inherently incompatible, and that a more carefully crafted piece of legislation can effectively address both goals. We propose that any new legislation do two things: 1) introduce a flat-rate ceiling that will ensure solar power users are rewarded rather than penalized for using solar energy; and 2) expand the incentives for efficient temporal energy use to all energy customers, not just solar power users. These improvements will successfully address the legislature's goals in passing S.B. 1.

## I. BACKGROUND

Unwilling to wait for energy reform on a national scale, California passed S.B. 1 in response to the ever-increasing costs of energy production and concerns about pollution and global warming.<sup>2</sup> However, S.B. 1 was not created from scratch. Rather, it is the current and most expansive policy in a string of efforts to expand solar energy in California by providing subsidies for installations of solar electricity. Collectively, these efforts constitute the California Solar Initiative.<sup>3</sup>

The first and primary goal of S.B. 1 was to accelerate the adoption of technology converting solar energy into electricity, thus having an immediate impact on greenhouse gases while concomitantly addressing California's ever-

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2. See, e.g., Steven Mufson, *In Energy Conservation, California Sees Light; Progressive Policy Makes it a Model in Global Warming Fight*, WASH. POST, Feb. 17, 2007, at A01.

3. The California legislature first created solar incentive programs in 1998, experiencing "solid, but bumpy, growth." In 2001, the California Public Utilities Commission (CPUC) upped this nascent solar program by administering the Self-Generation Incentive Program, created primarily for the purpose of expanding solar energy incentives for large commercial-sized consumers. In 2005, an executive order compelled the CPUC to begin developing the California Solar Initiative (CSI). Specifically, the Commission was charged with creating a much broader program, aimed at "commercial, government, non-profit, existing residential and affordable housing solar customers in the Pacific Gas and Electric (PG&E), Southern California Edison (SCE) and San Diego Gas and Electric (SDG&E) territories." In December 2005, the CPUC issued D.05-12-044, directing CPUC staff to design the program, integrating input from various parties such as utilities companies, environmental groups and solar companies. This input in turn led to S.B. 1. See Glenn Harris & Shannon Moynahan, *THE CA SOLAR INITIATIVE – TRIUMPH, OR TRAIN WRECK?: A YEAR TO DATE REVIEW OF THE CPUC'S CA SOLAR INITIATIVE 1-2* (Sept. 2007); and California Public Utilities Commission, *CALIFORNIA SOLAR INITIATIVE HISTORY*, [http://www.cpuc.ca.gov/PUC/energy/Solar/061228\\_csihistory.htm](http://www.cpuc.ca.gov/PUC/energy/Solar/061228_csihistory.htm)

increasing demand for electricity.<sup>4</sup> Legislators addressed this goal by establishing a series of more specific, interrelated targets: installing 3000 megawatts of solar energy systems throughout the state; establishing a self-sufficient solar industry in California that provides solar energy systems as a viable mainstream option for homes and businesses by 2017; and placing solar energy systems onto fifty percent of new homes by 2020.<sup>5</sup>

In the spirit of reform, however, the California legislature also used S.B. 1 to address a second, related goal: matching solar energy production to peaks in electricity demand. In the summer, peak-demand usually occurs in the late afternoon, when air-conditioners operate at maximum capacity. So, for example, if energy demand peaks at 3 pm, then ideally electricity created from solar energy would also peak at 3 pm.

As a means to this end, S.B. 1 provided a simple incentive to prospective solar-energy customers: receiving a rebate for solar-electricity installation was conditioned upon the customer switching to a time-of-use billing structure.<sup>6</sup>

The bill expressly considers this in economic terms, stating that “a solar initiative should be a cost-effective investment by ratepayers in peak electricity generation capacity where ratepayers recoup the cost of their investment through lower rates as a result of avoiding purchases of electricity at peak rates.” As passed, S.B. 1 was widely praised as one of the most aggressive solar programs in the United States.<sup>7</sup>

However, the practical implementation of the program has been a far more difficult task than imagined, impaired in part by the unintended consequences of mandatory TOU rates.<sup>8</sup> Despite the best of legislative intentions, S.B. 1 stumbled out of the gates, performing especially poorly in hot, desert areas like

4. For the latest report on the demand for electricity in California, see Tom Gorin & Lynn Marshall, CALIFORNIA ENERGY DEMAND 2008-2018 STAFF REVISED FORECAST (Nov. 2007), available at <http://www.energy.ca.gov/electricity/index.html#demand>.

5. S.B. 1 § 4, Ch. 8.8 § 257809(a).

6. A TOU billing structure is essentially one in which the rate charged for energy is variable throughout the day in accordance with demand. As a result, energy is cheapest at night (when there is low demand) and typically most expensive during the day (when there is high demand).

7. Harris & Moynahan, *supra* note 3, at 1. See also, Michelle Gamble-Risley, *California Extends Rebate Plan to Municipal Utilities*, ENGINEERING NEWS-RECORD, Sept. 3, 2006, at 16 (predicting a “boom” and “certainty” in the solar-energy industry); Chris Taylor, *New Year’s Revolutions*, BUSINESS 2.0, Dec. 2006, at 109 (noting that the “solar power industry is taking off” in California); Gregory Dicum, *Plugging Into the Sun*, N.Y. TIMES, Jan. 4, 2007, at F1; Roger Showley, *At Home in a Solar System*, SAN DIEGO UNION-TRIBUNE, Dec. 10, 2006, at I-1.

8. It is interesting to note that much of the excitement surrounding solar energy has revolved around the increasing availability of the technology. See, e.g., Mark Lapedus, *Thin-film Cells Fatten Solar Market*, ELECTRONIC ENGINEERING TIMES, Feb. 19, 2007, at 18. However, the popular debate about how to convert the availability of this technology into solid public policy has been anemic. As this Note shows, the assumption that the policy will work itself out is not only false, but a major threat to the survivability of innovative and experimental reforms at the state level.

southern California. While designed to address S.B. 1's second goal, the mandatory TOU provision inadvertently created perverse disincentives that undermined S.B. 1's first, more important goal. By requiring TOU rates, S.B. 1 had made the apparently untenable assumption that solar power would cover each customer's demand, thereby eliminating that customer's need to purchase electricity from the grid during times of peak demand. Where this assumption was unfounded, solar-energy customers would actually foot higher energy bills. Thus, the very provision meant to incentivize efficient energy usage actually functioned as a devastating financial disincentive.<sup>9</sup> In fact, some customers found that the TOU rates rendered solar-energy more expensive than flat rates with conventional energy.

Consequently, in the first three months of 2007, the Public Utilities Commission reported a seventy-eight percent decline in requests for solar power equipment rebates; in the Southern California Edison territory, not a single new solar panel was installed between January and May of 2007.<sup>10</sup> By May, the solar installation industry was "threatened with collapse across much of California."<sup>11</sup>

Aghast at a policy gone awry, the legislature passed A.B. 1714, temporarily suspending the TOU requirement until January 2009.<sup>12</sup> A.B. 1714 was immediately signed into law by Gov. Schwarzenegger on June 7, 2007.<sup>13</sup>

## II. DELAYING IMPLEMENTATION OF TIME OF USE

Passed on June 7, 2007, A.B. 1714 amends Section 2851(a)(4) of the California Public Utilities Code. It delays the implementation of time-variant or TOU pricing until the next general rate case<sup>14</sup> of the state's three largest elec-

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9. Unfortunately, desert areas tend to have higher demand for energy-intensive goods such as air-conditioning during peak electricity demand times (mid-afternoon in summers, for example). Therefore, when stuck with a variable rate and a solar-energy system that did not cover their entire demand, solar energy customers ended up having to purchase a great deal of electricity at peak-time rates.

10. Marc Lifsher, *Energy; Rebate rule chills sale of solar*, L.A. TIMES, May 8, 2007, at C1.

11. *Id.*

12. A.B. 1714 § 1, 2007-2008 Assem., Reg. Sess. (Cal. 2007); Press Release, Cal. Pub. Util. Comm., PUC Removes Mandatory Time-of-Use Rates for Solar Customers (June 7, 2007), available at [http://docs.cpuc.ca.gov/published/NEWS\\_RELEASE/68820.htm](http://docs.cpuc.ca.gov/published/NEWS_RELEASE/68820.htm). See also Marc Lifsher, *Gov. Acts to Salvage Solar in California*, L.A. TIMES, May 10, 2007, at C2; Marc Lifsher, *State Corrects Flaw in Solar Law*, L.A. TIMES, June 8, 2007, at C1.

13. A.B. 1714 § 1, 2007-2008 Assem., Reg. Sess. (Cal. 2007). At the same time, the CPUC approved D.07-06-014 with the same purpose.

14. A rate case is the process in which a regulatory board reviews utility rates. In the simplest example, a utility would file for a rate increase, and the commission would approve or deny. As market-based policy initiatives attempt to incentivize customer behavior, the rate case can become more complicated, with different rate structures available to different types of customers.

tric utilities (Southern California Edison, Pacific Gas and Electric, and San Diego Gas and Electric), scheduled to be completed after January 1, 2009.<sup>15</sup> The bill rolls back S.B. 1's TOU requirement until the California Public Utilities Commission (CPUC) and the utilities create a TOU pricing structure that satisfies the requirements of the new Section 2851(a)(4)(A) (formerly Section 2851(a)(4)). According to S.B. 1, A.B. 1714, and the CPUC's findings of fact regarding time-of-use pricing, any time-of-use tariff must "a) provide the maximum incentive for ratepayers to install solar energy systems with production that coincides with California's peak electricity demands, b) assure ratepayers receive due value for their contribution to the purchase of solar energy systems, and c) provide solar customers an incentive to use energy efficiently."<sup>16</sup> A.B. 1714 also allows current customers to switch to a flat rate and receive a credit for any past overpayments with the time-variant rate.<sup>17</sup>

As an urgent amendment to the Public Utilities Code, A.B. 1714 merely delays the implementation of TOU pricing until sometime in 2009. The bill retains S.B. 1's broad and general language, giving the PUC and utilities authority to set any TOU rate for solar installations which they determine to be appropriate, as long as the new rates maximize incentives to install photovoltaic systems coinciding with peak demand, provide ratepayers with due value, and give customers an incentive to use energy efficiently. Neither the bill nor the CPUC's stated position on this topic suggest what should or could happen if the CPUC and utilities are unable to create a tariff structure that meets these requirements.<sup>18</sup>

### III. LEGISLATIVE HISTORY OF S.B. 1

The legislative history of S.B. 1 suggests the legislature did not fully consider the effects of mandatory TOU pricing. On April 24, 2006, in an attempt to maximize electricity production during times of peak demand, the legislature considered adding the option of time-variant pricing for residential as well as commercial customers.<sup>19</sup> In the July 5, 2005 revision of S.B. 1, the legislature

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15. A.B. 1714 § 1, 2007-2008 Assem., Reg. Sess. (Cal. 2007); Cal. Pub. Util. Code § 2851(4)(C) (2007).

16. Opinion Modifying Decision 06-12-033 Regarding Time Variant Pricing Requirements, 2007 WL 1702796, No. 07-06-014, I.D. 151971 (Cal. Pub. Util. Comm. Jun. 7, 2007).

17. A.B. 1714 § 1, 2007-2008 Assem., Reg. Sess. (Cal. 2007); Cal. Pub. Util. Code § 2851(4)(C) (2007).

18. *Id.*

19. *California Solar Roofs Initiative: Hearing on S.B. 1 Before the Assem. Comm. on Utilities and Commerce*, 2005-2006 Assem., Reg. Sess. 10 (Cal. 2006) ("The MSRI [Million Solar Roofs Initiative] developed in S.B. 1 required the PUC to make the option of time-variant pricing available for all ratepayers with a solar energy system. This provision was to reward customers for placing solar energy panels on their buildings to maximize electricity production during the time of day when California faces peak electricity demand, in the late

*required* time-variant pricing for all ratepayers with a solar energy system instead of making this pricing scheme an option alongside traditional flat-rate pricing. The Senate Bill Analysis explains the legislature's desire to match solar electricity production with peak demand:

Recent amendments to the bill will require at least 50% of all MSRI [Million Solar Roofs Initiative] funds be used for performance based incentives that will place a higher value production at times of peak demand and will require that all solar customers are billed on a time-of-use basis. These amends will create strong incentives for customers to optimize their solar panels for peak load production.<sup>20</sup>

The legislature may have overestimated customers' abilities to change the orientations of solar panels on a fixed roof surface. Adjusting the tilt and direction of the solar panels can generate more electricity in the afternoon during peak demand, but doing so can significantly increase the cost of installation. Additionally, the legislature seems to have not considered the possibility that a customer could use more electricity during times of peak demand than his solar installation can provide.

#### IV. IMPACT OF THE LEGISLATION

The TOU requirement chilled the solar industry. The Southern California Edison area was disproportionately impacted—one executive claimed that had the TOU been required in 2006, about half of his customers would have been negatively impacted.<sup>21</sup> The CPUC was persuaded that a “lack of sufficient unshaded roof space and funding limitations” rendered customers unable to fully

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afternoon. Time variant pricing results in larger decreases in customer bills when solar power is produced at peak demand periods. In the CSI, the PUC requires time variant pricing for business customers but not for residential customers. Statutory provisions prevent the PUC from designing effective time variant pricing for residential customers. The committee may want to consider amending the bill to make the statutory changes needed to allow for time-variant pricing for residential customers and to require the PUC to make that option available for residential customers.”).

20. *Million Solar Roofs Initiative: Hearing on S.B. 1 Before the Assem. Comm. on Utilities and Commerce, 2005-2006 Assem., Reg. Sess. 8-9 (Cal. 2005)*. The Assembly provides additional background information: “Currently, California’s solar electricity production is at its peak between 1:00 pm and 2:00 pm in the afternoon, while total peak demand is generally later in the day between 3:00 pm and 7:00 pm when people come home from work and turn on their air conditioners. This means that while solar helps reduce peak demand, solar does not currently maximize the reduction in peak demand and there will still be a need to operate a large number of peaker plants on hot days. Most solar panels in California are installed to maximize total electricity production (generally facing south) and not to maximize production at the time of day power is needed the most. A solar panel facing south will produce more total electricity than any other configuration, but it will not maximize electricity when the state needs it the most, at times of peak demand. If however, the panels are configured so they point southwest; their peak production will coincide with peak demand and may offset the need to operate peaker plants.”

21. Petition for Modification of D.06-12-033, Declaration of Gordon Bloom, March 5, 2007.

offset peak electrical usage.<sup>22</sup> As a result, a typical Southern California Edison coastal customer faced a fifty percent jump in the payback period for solar investment.<sup>23</sup> A.B. 1714 is a stop-gap measure designed to give the CPUC and utilities more time to react to the poor reception to TOU rates and to develop improved rate structures. The bill does not authorize the PUC to remove the TOU requirement. The issue will surely resurface—A.B. 1714 mandates reintroduction of the TOU pricing structure at the next general rate case for utilities in early 2009. TOU rates will adversely affect homes which use more energy than they generate during peak hours. The table below illustrates the financial impacts of TOU rates. Compare Table 1's TOU prices to the flat rate of \$0.116/kWh for PG&E.<sup>24</sup>

TABLE 1: PG&E Time of Use Rates, E7 Schedule<sup>25</sup>

Rate Level	\$/kWh	Period
Summer peak	\$0.299	Noon-6 pm Mon-Fri
Summer off-peak	\$0.088	All other times
Winter peak	\$0.116	Noon-6 pm Mon-Fri*
Winter off-peak	\$0.091	All other times

\*Winter is November 1 to April 30

During the summer, a house might consume 1000 kilowatt-hours (kWh) per month, or about thirty-three kWh in a day. With a three kW photovoltaic system and around five hours of effective sunlight, the solar array could produce about fifteen kWh each day. If no one is at home during the peak times of noon to 6pm, and the house uses relatively little electricity, then time of use metering works well both for the consumer, who is able to sell electricity to the grid at the higher peak-rate, and the utility, which needs to produce less electricity during the more expensive peak-demand periods. When the home-owner buys back power from the grid at night, the power costs less than one-third of the daytime rate. This gives the homeowner more incentive to buy a solar installation, as it can rapidly increase the investment's rate of return.

However, if the house has a small or partially shaded roof, other constraints limit the size of the photovoltaic installation, or a home has particularly high consumption during the day, the power generated by the photovoltaic system

22. Opinion Modifying Decision 06-12-033 Regarding Time Variant Pricing Requirements, Before the Public Utilities Commission of the State of California, June 07, 2007.

23. Petition for Modification of D.06-12-033, Declaration of Patrick Redgate, March 5, 2007.

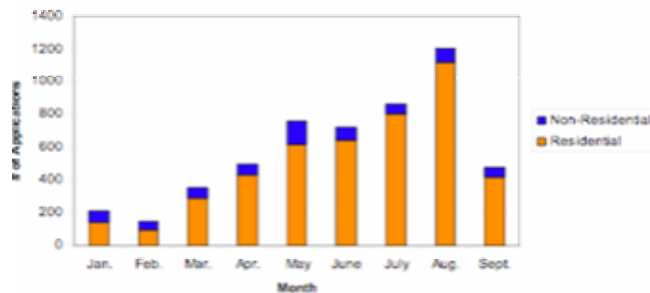
24. PACIFIC GAS & ELECTRIC CO., SCHEDULE E-1: RESIDENTIAL SERVICE 1 (Dec. 27, 2007), available at <http://www.pge.com/tariffs/pdf/E-1.pdf>.

25. PACIFIC GAS & ELECTRIC CO., SCHEDULE E-7: RESIDENTIAL SERVICE 2 (Dec. 27, 2007), available at <http://www.pge.com/tariffs/pdf/E-7.pdf>.

may not offset electricity demand during peak hours. The homeowner must draw energy off the grid at a price that is almost triple the flat rate. Requiring TOU pricing for such a consumer would make a solar installation cost-prohibitive.

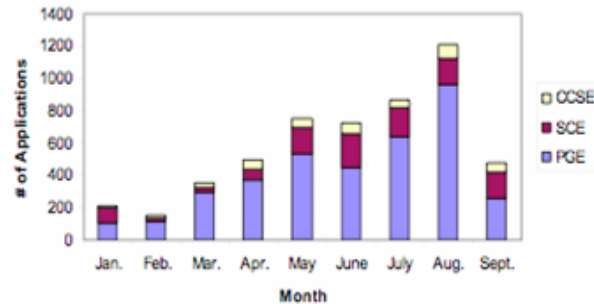
The example above illustrates how TOU metering can benefit some customers and hurt others, depending on the time of day they consume the most electricity. Customers with low peak demand for electricity, or those who can shift their demand to off-peak times, will want TOU rates. Moreover, such customers who own a photovoltaic system want the largest gap in prices between the peak and off-peak rates, as they can sell power during the day at the peak rate and buy power back during the off-peak times at lower rates. Customers who cannot shift their demand away from the peak periods, however, will want the smallest possible gap between on- and off-peak demand periods. A solar installation, unless it has the capacity to keep up with a customer's entire consumption during peak periods, will not fully offset the additional costs involved in switching to TOU metering. Figures 1 and 2 below demonstrate the impact on solar installment applications in 2007. In both graphs, September represents a half-month of data.

FIGURE 1. Total Applications, All Three Program Administrators, January 1 – September 18, 2007<sup>26</sup>



26. CALIFORNIA SOLAR INITIATIVE, CALIFORNIA PUBLIC UTILITIES COMMISSION STAFF PROGRESS REPORT 15 (2007).

FIGURE 2. Total Applications, All Customer Types, January 1 – September 18, 2007<sup>27</sup>



As the first graph illustrates, solar installments had a dismal start. However, the impact of the TOU provision is best demonstrated in the second graph. Starting in May, applications from the Southern California Edison region, which covers vast dry areas, increased substantially.

A.B. 1714 does little to address these issues and conflicting interests other than adopt a wait-and-see approach. Given the reductions in solar installations under S.B. 1 in its original form, the approach in A.B. 1714 was appropriate, but the TOU debate will resurface during the rate case in 2009. A solar installation already reduces peak electricity load without the requirement of switching to a TOU tariff structure. If requiring TOU rates reduces the number of customers who are able to afford a photovoltaic system, then the requirement may have the unintended consequence of increasing or at least maintaining peak demand. A better system might include measures to shepherd customers towards TOU metering, while not penalizing customers who would be worse off under a TOU scheme.

Merely suspending the TOU requirement has been a successful policy decision in and of itself, as solar-powered homes started to outsell traditionally electrified new homes in some California markets by the end of 2007.<sup>28</sup> Nonetheless, the California Energy Commission's Integrated Energy Policy Report concluded that the state "must accelerate its pace of renewable development" in order to meet its 2011-2020 goals.<sup>29</sup> This warning casts an uncertain light on the future of solar power in California.

27. *Id.*

28. *Sun-Powered Homes Defy a Cool Housing Market*, L.A. TIMES, Sept. 25, 2007, at C1; Debra L. Reed, Op-ed, *The Sunrise Powerlink*, SAN DIEGO UNION-TRIBUNE, Dec. 14, 2007, at B-7 (Reed is president and CEO of Sand Diego Gas & Electric Co.).

29. PAMELA DOUGHMAN, ET AL., 2006 INTEGRATED ENERGY POLICY REPORT UPDATE (California Energy Commission 2006); see also, Press Release, California Public Utilities Commission, PUC Simplifies and Streamlines Solar Program Requirements (Sept. 6, 2007) (on file with author).

## CONCLUSION

The TOU debacle suggests several broad guidelines for California's solar future. First, simply funneling money and subsidies does not, by itself, lead to effective solar energy policy—these subsidies have to be couched in more deliberate policy.<sup>30</sup> Second, political stamina is a necessary condition for the survival of solar energy. And finally, while the incredible growth sustained by the solar industry is cause for optimism, this growth and optimism is no substitute for careful policy.<sup>31</sup>

Responding to a series of social, economic, and environmental concerns, S.B. 1's primary goal was to accelerate adoption of clean solar technology. Enthusiastic for energy reform, the legislators tacked on a second, macro-level goal: creating a system in which the rate of solar energy being converted to electricity corresponds to the demand for electricity at that time of day. Basically, they wanted to incentivize not only the use of solar power, but the efficient use of that power. Here, however, the legislators tried to do too much. In pursuing the second goal, S.B. 1 unwittingly created an instrument that opposed the attainment of the first goal.

There is nothing wrong with legislation that addresses numerous societal needs—indeed, this is often the best way to approach problems because it helps policymakers better consider interrelated issues. In the case of S.B. 1, the legislature should persist in pursuing both goals. However, the wait-and-see approach taken in A.B. 1714 can only be a band-aid solution, not a long-term policy. Instead of simply allowing solar energy users to opt for a flat rate, as A.B. 1714 does, the legislature should pass new legislation that makes the flat rate a ceiling for rates paid by solar-energy users. At the same time, solar energy users should be paid at the variable rates for the energy they produce. This way, solar energy users are guaranteed a flat rate in case their panels are not creating sufficient energy to meet their personal demand. In these scenarios, solar energy would still be a profitable option, as the cost of electricity will be the flat rate charged minus the energy created by the solar panel (calculated using the variable rate). Unlike A.B. 1714, this approach still provides an incentive to use solar energy efficiently, for doing so can provide a payback at the higher variable rates. This addresses both the primary and the secondary goal behind S.B. 1.

There is, however, a more fundamental policy flaw in S.B. 1. Namely, the bill only addresses peak demand use among solar users. That is, the TOU rates create an incentive for solar customers to install their solar equipment to match peak demand, and create incentives for them to use their energy efficiently. Yet it is unclear why the legislature should seek to reduce peak-energy usage for

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30. This lesson has not been lost on Californians. See Greg Sellers, Opinion, *Solar Industry Needs Boost From Govt. to Thrive*, SAN JOSE MERCURY NEWS, Sept. 5, 2007.

31. For an example of this optimism, see Marc Gunter & Tom Woody *The Future's So Bright, I Gotta Wear Shades*, FORTUNE MAG., Oct. 15, 2007, at 162.

solar power users only.<sup>32</sup> Instead, the legislature should pass a bill mandating TOU rates for certain classes of non-solar power users, thus making wasteful energy expenditures during the day more costly. These classes could include commercial customers as well as those residential customers who use a higher than average amount of energy. This would, in turn, not have an adverse impact on low-income families (who typically use less energy) and, in fact, would drive down energy costs for those who use less than the average amount of energy. Consequently, homes and businesses would have incentives to shift electricity use, conserve, or install solar panels.

The implementation of these policies would more rapidly push California towards its twin policy goals of increasing solar panel usage and promoting energy efficiency. Flexible institutions such as the CPUC coupled with the political will to reform energy policy are necessary means to California's goals and certainly a cause for optimism.

At the same time, without developing a precise set of incentives that comprehensively address energy issues, the solar market in California will remain, well, a bit chilly.

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32. This is true for two reasons. First, solar consumers constitute only a small portion of energy demand and therefore addressing their energy habits can have only a limited effect on the market. Second, solar energy usage is already a type of behavior we would like to encourage, whereas those relying completely on electricity generated by coal or other "dirty" technology are intuitively better candidates to be incentivizing into efficient energy use.