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 (Filed November 8, 2012)

OPENING COMMENTS OF THE UTILITY REFORM NETWORK ON A NET ENERGY METERING TRANSITION PERIOD

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December 13, 2013

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Pursuant to the directions in the "Assigned Commissioner's Ruling Regarding the Establishment of a Net Energy Metering Transition Period" (the "ACR"), and the schedule adopted by ALJ MacDonald, the Utility Reform Network ("TURN") respectfully submits these comments and proposals for rules implementing the "transition period" for existing net energy metering ("NEM") customers pursuant to newly enacted § 2827.1(b)(6) of the Public Utilities Code.

AB 327, signed by the Governor on October 7, 2013 and taking effect on January 1, 2014, directs the Commission to establish a time period during which customers who install solar generation prior to July 1, 2017, could continue service under the existing net energy metering ("NEM") bill crediting tariff. The relevant legislative language, as quoted in the ACR, directs that the transition period should "consider a reasonable expected payback period based on the year the customer initially took service under the [NEM] tariff or contract."[1]

The ACR asks a number of questions concerning the proper calculation of the transition period. The primary issue is whether the transition period should consider a "payback period" or some other criteria, including the "expected system life" of a rooftop solar photovoltaic system. As explained below, both the legislative language and practical considerations indicate that the Commission should use an "expected payback period" as the primary basis for setting the transition period.

[1] PU Code § 2827.1(b)(6).

The payback period for residential customers varies with date of installation, customer consumption and the ratio of solar generation to consumption.[2] TURN shows that a reasonable average expected payback period for residential customers has ranged from about 15 years during 2005-2008, to about 10 years for installations in 2012. Payback periods should continue to decrease due to a significant decline in solar costs. Based on these rough calculations and policy considerations, TURN recommends that the Commission adopt a transition period ending on December 31, 2020 for **all** NEM customers who install systems prior to July 1, 2017. Such a mechanism results in a declining payback period, consistent with the actual data on solar costs and payback periods. Moreover, a declining payback period prevents a "gold rush" of NEM 1.0 customers that might occur if the Commission established a transition period that ended in later years for newer customers.

TURN recommends that all customer classes be subject to the same transition period. While payback periods for commercial customers may differ, the nature of the subsidy under NEM is much smaller for commercial customers, meaning that any future NEM 2.0 is likely to be a less dramatic change from NEM 1.0. However, if data concerning payback periods show markedly different results, the Commission could establish a later date for the expiration of the transition period for other customer classes.

[2] See, for example, LBNL, "The Impact of Rate Design and Net Metering on the Bill Savings from Distributed PV for Residential Customers in California," April 2010.

AB 327 directs the Commission to develop a new net energy metering tariff, let us call it NEM 2.0, by no later than December 31, 2015. NEM 2.0 will replace the existing NEM 1.0 tariff by July 1, 2017, or earlier if the NEM cap is reached earlier.[3] AB 327 also directs the Commission to grandfather any customers taking service under NEM 1.0 for a "transition period" to be established by the Commission by no later than March 31, 2014.[4] Any customer taking service on or after July 1, 2017 will take service under NEM 2.0, and any existing NEM 1.0 customer will default to NEM 2.0 after the end of the transition period.

AB 327 requires the Commission to consider a "reasonable expected payback period based on the year the customer initially took service under the tariff" in determining the transition period. The ACR asks how to define this term, and whether it should differ for different classes of customers.

The payback period is a term of common usage that defines the number of years required for the sum of financial benefits (cash flows) of an investment to equal the initial investment.[5]

[3] PU Code § 2827.1(b), effective January 1, 2014.
[4] PU Code § 2827.1(b)(6).
[5] See, for example, Brealy and Myers, *Principles of Corporate Finance*, p. 64 (1981). The payback period ignores all future cash flows and thus does not consider the total present value of the investment.

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The ACR notes that the Governor's signing message directed the Commission to consider the expected life of the system.[6] As a result, the ACR also asks whether the transition period should be related to the expected system life, and whether the system life should be based on the ten-year warranty required by the California Solar Initiative program.

AB 327 provides the Commission with discretion in developing the transition period, as long as the Commission considers the "reasonable expected payback period" in crafting the grandfathering rules. While the Commission may consider the Governor's signing statement in exercising its statutory discretion to craft policy, those statements do not at all bind its decision-making.[7]

The determining how to weigh the statutory language and the Governor's signing message, the Commission's duty is to implement the statute in a manner consistent with the intent of the Legislature. The underlying objectives of replacing existing NEM 1.0 with NEM 2.0 were to promote the sustainable growth of customer-sited renewable generation while ensuring that the total benefits to all customers were equal to the total costs, meaning that NEM tariff should be based on the costs and benefits of solar generation.[8] Given that the existing costs to non-participant ratepayers (in 2012) exceeded the avoided costs

[6] ACR, November 27, 2013, p. 1-2.

[7] See, for example, *American Financial Services Assn. v. City of Oakland*, 34 Cal. 4th 1239, 1264 (2005) (Court may not consider post-enactment events such as the Governor's signing statement).

[8] PU Code § 2827.1(b)(1) through (b)(4).

by between $79 million and $252 million,[9] it is apparent that the Legislature intended to reduce the ratepayer subsidy to solar customer-generators. The intent of the Legislature to reduce NEM subsidies is reflected in the language of the legislative analysis prepared after NEM reform language was first introduced in amendments on August 21, 2013:

> As transmission and distribution costs are typically one-half to two-thirds of a residential customer's billing, full retail NEM offers a substantial subsidy to NEM customers with the costs being shifted to non-NEM customers. Given that rooftop solar now generates 1,173MW in the IOU territories, the cost of full retail NEM comes at a cost of approximately $60 million to non-NEM customers across the state. The Legislature has in the past justified this subsidy as it stimulates the solar industry, helps the state reach its renewable energy goals, and provides other external benefits.[10]

The primary legislative analysis of the grandfathering provision of AB 327 provides additional explanation of the legislative intent behind this section:

> For customers who are using the current NEM program, this bill establishes a transition to the new NEM. The PUC is to establish a transition period for existing and new NEM customers added prior to July 2017 and adopt rules for this transition. The PUC must consider a reasonable expected payback period based on the year the customer initially took service. Self-generation customers receive an array of support, some of which are described in this analysis. A recent report by the Climate Policy Initiative found that the financial value of bill savings and the sum of only a few of the incentives mentioned above exceed average system prices. The PUC will need to define what is meant by a "reasonable expected payback period" and establish standard assumptions for calculating the payback period, particularly the price paid for the on-site generation because this value varies widely and the price affects payback. In addition, the bill language refers to reasonable payback from the perspective of the utility customer. However, some customers may elect to assign benefits to a third party financier, such as but not limited to tax credits or local rebates. The PUC will need to address how to adjust

[9] CPUC, "California Net Energy Metering Ratepayer Impacts Evaluation," October 2013, p. 6-7.

[10] Bill Analysis, Senate Appropriations Committee, August 26, 2013, p. 2.

the reasonable payback period if a customer transfers some of these values to another entity.[11]

The plain language of the statute and the accompanying legislative analyses make clear that the intent of the Legislature was to ensure that customers retain the benefits of their private investment at least for a time period necessary to recoup the investment, taking into account the various additional subsidies for solar installations. However, the Legislature was very conscious that the number of incentives available to self-generation customers could actually exceed the price of the investment.[12] The transition period must be designed to harmonize the overall intent of the Legislature to reduce inequitable subsidies that greatly exceed the benefits of solar generation, while protecting the private investment of existing NEM 1.0 customers.

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Developing a transition period based on a reasonable expected payback period is good public policy because it appropriately balances private and public investments and treats private investors and non-participating customers fairly.

For customers who make a rational economic decision, the expected payback period must be shorter than the expected system life. Thus, providing a NEM 1.0 subsidy for the expected system life would result in customers recouping their investment through bill discounts and then collecting additional

[11] Bill Analysis, Assembly Committee on Utilities and Commerce, September 11, 2013, Page I (footnote omitted).

[12] The evidence indicates that this issue arises primarily for customers who may have received initial SGIP incentives, which were more lucrative than the incentives offered under CSI after 2006. The problem may still exist for certain fuel cell NEM customers, but TURN has not researched this issue.

ratepayer subsidies over and beyond their private investment in the solar system. Given that the purpose of AB 327 was to reform an unduly generous subsidy, and given that solar customers already receive additional ratepayer and taxpayer subsidies that reduce their private investment, it would be counter to the legislative intent to continue a subsidy for longer than the payback period.

The Commission should also recognize that NEM customers will continue to receive financial benefits from their systems under NEM 2.0. Although the revised tariffs have yet to be developed, it would be unreasonable to assume that customers will receive no ongoing value once they have been transitioned away from legacy NEM. Under NEM 2.0, these customers will continue to benefit from rate credits reflecting the value of their solar installation to the electric system. Calibrating the payback period to the stream of benefits available solely under NEM 1.0 would therefore be excessive.

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The payback period is the amount of time over which the financial benefits of an investment equal the amount of the investment. The "reasonable" expected payback period for a residential customer who purchases a solar system should consider the expected annual bill reduction benefits as compared to the amount of the private investment net of other public subsidies, primarily including tax credits and CSI or SGIP incentives.

For a residential customer under existing tiered rates, the payback period can vary greatly depending on the consumption of the customer, the percentage of load offset by the on-site generating system, and the capacity factor of the

system.[13] The two most significant variables are the amount of generation in upper tier rates offset by solar output,[14] and the initial cost of the solar system.

There is significant public data quantifying these variables. At least one report has calculated the economic benefits of solar self-generation for a range of residential customer consumption characteristics, normalized as the "price" of the solar output to the generating customer. The data show that the value of rooftop solar output under NEM (using 2009 data) ranged from 15 to 35 cents per kilowatthour of solar generation, with an average "value" (i.e. benefit **to the solar customer-generator**) of about 20-25 cents per kilowatthour for a customer with varying PV-to-load ratios.[15] These values are consistent with the more recent data in the NEM cost-effectiveness analysis, showing an averaged levelized **value to the solar customer** of solar output from 25 cents / kWh (export only) to 33 cents / kWh (all generation).[16]

LBNL has likewise provided aggregate data on average system installation costs for different solar system sizes. The installed price of small residential solar prices was relatively constant at about $9 per watt from 2006 through 2008, then declined dramatically to less than $6 per watt in 2012.[17]

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[13] See, for example, LBNL, "The Impact of Rate Design and Net Metering on the Bill Savings from Distributed PV for Residential Customers in California," April 2010.

[14] The average consumption of a residential NEM customer is more than twice that of an average residential customer. See, for example, LBNL, "Electricity Bill Savings from Residential Photovoltaic Systems," January 2013, p. 25.

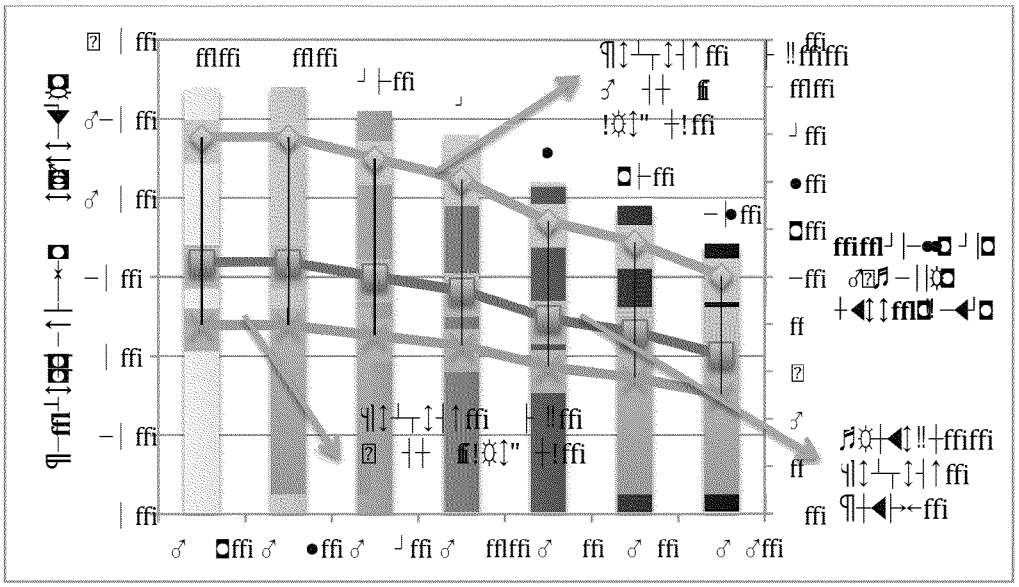
[15] LBNL, April 2010, Figure ES-1, p. x. Much of the data in the LBNL is derived from the CSI database. Due to time and resource constraints, TURN relies on the aggregated LBNL reports rather than trying to use the source data.

[16] CPUC, "California Net Energy Metering Ratepayer Impacts Evaluation," October 2013, Tables 13 and 14, pp. 48 and 49.

[17] LBNL, "Tracking the Sun VI," July 2013, p. 13-14.

The statute directs the Commission to consider the year of system installation in the payback period calculation. Using the LBNL data on system costs and the value of solar output, TURN has roughly calculated a range of payback times for "typical" solar customer during the time frame 2006-2012.[18] The two endpoints are based on the solar "values" of 20 and 30 cents, and assuming capacity factors of 15% and 20%. Since the value is normalized, the results are similar for different size systems. As shown in Figure 1 below, the average payback period ranges from 10.1 years in 2012 to 15.9 years in 2006, and the maximum range is from 7.6 years to 23.8 years.

Figure 1: Payback Periods for Residential Systems[19]



[18] TURN's analysis reduces installed costs by 30% to account for tax credits, but does not reduce cost data to account for any other subsidies. Thus, the long payback periods in 2006-2008 would be somewhat reduced due to more significant CSI incentives during that time period.

[19] Using LBNL data for cost and value of solar output. Low payback period line based on 30-cent value and 20% capacity factor for a 4 kW (AC) system. High payback line based on 20-cent value and 15% capacity factor.

The financial impacts for higher usage (higher tier) customers would be more favorable, resulting in shorter payback periods. Moreover, solar costs are declining, so that payback periods for installations in 2013-2017 should be lower. Indeed, at least one industry vendor has calculated that payback periods in a number of states, including California, have fallen below ten years by 2011, consistent with the average data presented above.[20] A vendor analysis prepared for the author, in anticipation of investing in a pre-pay lease in 2013, showed a payback period of 11.6 years for a residential customer with annual consumption of about 6200 kWh, which is significantly lower than the average NEM customer and thus results in a longer payback period.

TURN's payback analysis addresses only the economics of direct ownership or a full pre-pay lease. Many residential customers are currently installing solar systems under a lease or PPA arrangement. Presumably, if the lease or PPA terms result in a "price" for electricity that is lower than the avoided utility price, the payback period is essentially zero. TURN recommends, however, that the Commission not attempt to treat customers using non-ownership arrangements differently for purposes of the transition period.

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Based on the policy considerations guiding AB 327 and the payback calculations presented above, TURN recommends that the Commission adopt a transition period ending on December 31, 2020 for **all** NEM customers who install systems prior to July 1, 2017. Such a mechanism results in a declining

[20] Clean Power Research, "One Block Off the Grid," February 15, 2012, available at http://1bog.org/blog/infographic-how-much-does-solar-cost/ .

payback period, consistent with the actual data on solar costs and payback periods. The transition period would be at least ten years for all installations through the end of 2010.

Under this proposal the transition period for installations after 2010 would decline each year, resulting in a transition period of at least four years for installation in 2016. While such a time period may be shorter than the potential payback period in 2016, there are valid policy reasons to establish a declining payback using a single transition end date. First, such a mechanism reflects actual declining payback periods, and the fact that customers will continue to receive benefits of their solar production under any future NEM 2.0. The potentially reduced private benefits under NEM 2.0 may simply mean that payback periods will not decline significantly below ten years, as could happen given present solar cost trends. Thus, such a mechanism would provide for equity between customers who have installed solar earlier and between customers installing in 2011-2016.

Second, such equity and declining transition periods would also minimize the potential for a "gold rush" of NEM 1.0 customers that might occur if the Commission established a transition period that ended in later years for newer customers. If customers knew that the transition period was fixed for a certain time, for example ten years, and could change dramatically come July 1, 2017, there would likely be a rush of new NEM installations prior to the transition date. A declining transition period results in a declining subsidy that alleviates the incentive to sign up just before the end of NEM 1.0.

TURN recommends that all customer classes be subject to the same transition period. While payback periods for commercial customers may differ,

the nature of the subsidy under NEM is much smaller for commercial customers,[21] meaning that any future NEM 2.0 is likely to be a less dramatic change from NEM 1.0. However, if data concerning payback periods show markedly different results, the Commission could establish a later date for the expiration of the transition period for other customer classes.

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[21] CPUC, "California Net Energy Metering Ratepayer Impacts Evaluation," October 2013," p. 7.