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NRDC/BIRAEnergy Comments on Draft Residential ACM Reference Manual

Additional submitted attachment is included below.

Comments on the 2016 Draft Residential Alternative Calculation Method Reference Manual
September 22, 2015 Draft - Photovoltaic Compliance Credit
Docket #15-BSTD-04
September 28, 2015

On behalf of BIRAenergy and the Natural Resources Defense Council, which has over 2 million members and online activists, 250,000 of whom are in California, we respectfully submit the following comments on the 2016 Draft Residential Alternative Compliance Method (ACM) Reference Manual Revised Draft published on September 22, 2015. We appreciate the opportunity to comment.

In June, the California Energy Commission adopted updated Title 24 Building Standards that will take effect January 1, 2017. These new standards will cut energy use in homes by approximately 28 percent, saving homeowners an average of \$7400 on their energy bills over the course of a 30-year mortgage. We commend the CEC for adopting these updated standards, which take a large step forward toward achieving the goal of zero net energy new residential construction by 2020 and add to the over \$30 billion that Title 24 has saved Californians on their energy bills since the first standards were adopted in 1975.¹

The Title 24 Building Energy Standards can be met through either the prescriptive or performance path, the latter of which is documented using compliance software. The ACM Reference Manual specifies the rules that this software must follow when determining the building model proposed and standard design. Given the large percentage of new buildings that comply with Title 24 using the performance path, the details of how the performance path is implemented through the ACM Reference Manual are very important.

NRDC submitted comments on the first draft of the ACM Reference Manual on August 20, 2015, which are included as Appendix A for reference. In the ACM Reference Manual, the CEC has proposed to allow a credit for photovoltaic systems that would allow a builder to trade off a PV system under the performance path for the energy savings achieved by the high performance walls and attics measures adopted in the 2016 Standards. This includes trading away all the benefits of high-performance attics, in particular providing solutions to putting ducts in conditioned space. While we support the concept of a PV compliance credit as a way to provide flexibility to builders thereby enabling higher levels of efficiency in the code, the CEC should clarify that the credit is time limited and that any future PV credit will be determined based on incremental energy efficiency savings beyond the 2016 prescriptive standards levels. The following comments focus on the PV compliance credit as proposed in the September 22, 2015 ACM Reference Manual Draft.

Comments on the Photovoltaic Compliance Credit

In the revised ACM Reference Manual Draft, the CEC has proposed to maintain the PV compliance credit as proposed in the August Draft ACM Reference Manual. In previous comments, NRDC and

¹ http://www.energy.ca.gov/releases/2013_releases/2012_Accomplishments.pdf

BIRAenergy both requested that the CEC include a sunset date for the PV credit of January 1, 2019 (one year in advance of the effective date of the 2019 Standards, which will take effect January 1, 2020). Other stakeholders made similar requests for a sunset date, which the CEC has not implemented in the current draft.

While we support a PV credit that is limited in size and duration, we are concerned that the credit will be maintained or grow in future code cycles if a sunset date is not set. **We recommend that the PV compliance credit in the 2016 Standards, which essentially allows a builder to trade off the long-term energy savings and other benefits from high performance walls and attics, including providing ducts in conditioned space, be for this code cycle alone.** We recognize that PV will play an important role in achieving zero net energy homes, but any PV credit given in the 2019 Standards should use the 2016 Standards as an efficiency floor and be evaluated based on the specific changes made between 2016 and 2019 Standards. Solar credits that allow reductions in insulation or equipment efficiency compared to cost-effective levels will not allow California to meet its zero net energy goals over the long term.

Therefore, the scope and limitations of the solar PV credit in the next code cycle should be decided based on the analysis performed for that cycle. We would oppose a PV compliance credit in the 2019 Standards that was equal to the combination of the 2016 PV credit plus additional efficiency measures added in the 2019 Standards. Put another way, we recommend that the performance path of the 2019 standards require a home to meet the energy budget of the 2016 standards using efficiency alone, at an absolute minimum. Any PV credit in 2019 should be above and beyond the efficiency required by the prescriptive path in 2016. The specific amount of any future PV credit should be determined based on the energy efficiency improvements achieved in the 2019 standards. **In summary, we recommend CEC include specific language regarding the termination date of this credit (no later than January 1, 2020 when the next code will take effect) and that any future allowances do not allow new buildings to use more energy than allowed by the prescriptive path of the just expired code.**

The rationale behind the PV credit in the 2016 code is to provide flexibility to builders as they learn how to implement the high performance walls and attics measures required by the prescriptive 2016 standards. These measures are likely to be key construction techniques for reaching zero net energy homes. While we support giving builders this flexibility in the 2016 code cycle, by 2020 when the 2019 standards take effect, the industry will have had substantial time to adjust to these new techniques. These measures have been under consideration since at least the 2013 Title 24 Standards development process and, according to the CASE reports developed by the IOUs for 2016, are already cost-effective. The high performance walls and attics measures which were considered but ultimately not adopted in the 2013 Title 24 Standards (and which are similar to the measures ultimately adopted in 2016) were also found by the IOUs to be cost-effective. Additionally, the California Advanced Home Program, which incentivizes highly efficient new construction, has provided additional incentives for homes that use high performance walls that meet the 2016 Standards requirements. By 2020, the industry will have had significant lead time to learn these construction techniques and should no longer receive a PV credit for them.

The main purpose of this tradeoff is to allow builders some extra time to learn how to install the new insulation measures adopted in the 2016 Standards while not reducing overall energy savings. Broadly, we are concerned that the different financing methods for solar may encourage builders to rely too heavily

on PV than is justified by the societal costs of efficiency compared to solar if the PV credit is not limited. We support the deployment of PV on homes and recognize the important role PV will play in reaching net zero. But we also note that distributed generation is not the same as efficiency. Distributed generation looks like efficiency from the utility's perspective only to the extent that it reduces load at a given instant. When distributed generation sends energy back to the grid, it no longer looks like efficiency from the utility's perspective: the economics are less favorable to the utility system and to society. The Title 24 Building Energy Standards are intended to improve building efficiency and reduce building loads. A future PV credit that continues to increase in size could encourage buildings that are large net electricity producers during certain hours of the day, which is not the purpose of the building efficiency standards.

In conclusion, we recommend that the CEC clarify that the PV credit for high performance walls and attics is only for the 2016 Standards and that any future PV credit will be evaluated based on improvements above the 2016 Standards, with the 2016 Standards providing the efficiency floor.

Thank you for the opportunity to comment.

Sincerely,



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Appendix A – NRDC Comments on August 2016 Draft of Residential ACM Reference Manual

Our comments on the 2016 Draft Residential ACM Reference Manual focus on two issue areas that we have raised throughout the 2016 Title 24 development process: the implementation of the solar PV credit and the treatment of heat pump electric water heaters. Our comments are as follows:

Solar PV Credit

Throughout the 2016 Title 24 development process, NRDC has supported the concept of a PV credit that is limited in scope and direction. We support the concept of a solar PV credit because we see it as a way to ease the pathway for increased energy efficiency in the building standards over time. The PV credit provides increased flexibility for builders as they learn how to implement cost-effective efficiency measures; this increased flexibility allows the CEC to set higher levels of efficiency in the standards. However, the PV credit should be limited in scope and duration to ensure that the bar for efficiency continues to be increased over time. California's loading order specifies that energy efficiency should be the primary energy resource. The PV credit should therefore be utilized as a method to achieve the highest levels of efficiency that are cost-effective in the building standards, rather than as a substitute for efficiency. We recognize that both deep energy efficiency savings and solar PV will play important roles in achieving California's ZNE goal for residential construction by 2020.

NRDC has emphasized from the beginning of the Title 24 process that the details of how the PV credit is implemented are very important and we continue to have some concerns with and recommendations on the current proposal. We offer the following specific comments on the proposed credit in the Draft ACM Reference Manual:

NRDC is concerned with the lack of publically available analysis behind the credit and with the percentage based structure. Our understanding is that the CEC's intent is to allow a PV credit that would be equal in amount to the time dependent valuation (TDV) energy savings achieved by the high performance wall and attic measures required by the 2016 Title 24 Standards. However, this is not how the credit appears to be implemented. The ACM Reference Manual calculates the PV credit by first calculating the TDV energy use of a reference home constructed with high performance walls and attics and then multiplying this TDV energy use by a specific percentage value, depending on the climate zone, found in Table 2-1. The resulting value is the amount of TDV energy that can be offset using solar. NRDC has two major concerns with this approach:

1. *Lack of publically-available analysis supporting values in Table 2-1.* No analysis has been provided to date to support the values in Table 2-1. NRDC has asked for this analysis both in oral testimony and by email to staff. While staff has indicated they will publish this analysis, it was not published in advance of the comment deadline. Without this analysis, we do not know whether the values in Table 2-1 are valid.

2. *Percentage based methodology is flawed.* Second, and more importantly, this percentage based methodology does not accurately reflect the savings that will be achieved by high performance walls and attics in an individual home. The percent of total TDV energy attributable to high performance walls and attics will vary from home to home, depending on the home's size and geometry. Using the percentage based approach will result in a credit that is sometimes larger and sometimes smaller than the actual savings that would be achieved by high performance walls and attics in that home.

We propose an alternate approach, as follows. The software should develop two reference homes: one that determines the TDV energy budget that must be met with energy efficiency measures alone (reference home 1) and a second that determines the TDV energy budget that can be met with a combination of solar and energy efficiency (reference home 2). Reference home 1 would meet all the requirements of the 2016 Title 24 standards except for walls and attics; for walls and attics, the prescriptive requirements would be equivalent to the 2013 Standard levels (i.e. everything except high performance walls and attics). Reference home 2 would include the full 2016 prescriptive requirements. This would both provide a more accurate way of giving a tradeoff equivalent to high performance wall/attic measures that would actually give a tradeoff equivalent to the savings from these measures for each individual home. It would also provide a framework for how to include PV in the code going forward as it moves toward net zero.

NRDC recommends that the PV credit sunset before the effective date of the 2019 standards. The stated intent of the PV credit is to provide flexibility to builders as they get up to speed on the high performance wall and attic measures required by the 2016 Title 24 standards. However, these measures, and additional efficiency measures, will be needed to reach the zero net energy goals by 2020. Many builders are likely to continue using the PV credit to offset these measures as long as it exists. If the credit does not have an end date specified, builders will not be motivated to scale up their abilities to implement the high performance wall and attic measures. We therefore recommend a sunset date of January 1, 2019 for the PV credit. This date would give ample time for the industry to get up to speed on how to implement these measures. Alternatively, the CEC could consider phasing out the credit in stages, for instance: in 2018, the credit could be reduced to just the high performance attics measure, and in 2019 sunset entirely.

Water Heating

NRDC continues to be concerned that the TDV values for gas and electricity do not adequately reflect the long-term emissions tradeoffs between gas and electricity. These concerns have been elaborated in our previous comments to the CEC during this proceeding, which are attached, in part, as Appendix 1. Given that TDV does not adequately capture this tradeoff, we recommend that the ACM Reference Manual specify that the same fuel source be used in the reference and proposed design for water and space heating. For electric water heating, we recommend that the reference design use a large electric water heater (above 55 gallons).

NRDC has also commented previously on the discrepancy in the hot water heating load calculated in the software for heat pump water heaters and gas water heaters. We understand that the CEC is investigating this issue and expects to update the software in the spring of 2016; we appreciate this upcoming modification.

We also appreciate the efforts of the CEC to reduce the barriers in Title 24 to the installation of heat pump water heaters in existing homes.