DOCKETED

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2016 DRAFT RESIDENTIAL ACM REFERENCE MANUAL

Additional submitted attachment is included below.

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August 15, 2015

RE: 2016 DRAFT RESIDENTIAL ALTERNATIVE CALCULATION METHOD REFERENCE MANUAL—Docket 15-BSTD-04

Knauf Insulation is a leading global manufacturer of building materials and glass mineral wool insulation products. These materials are produced with industry leading environmental qualities and carry third-party validations for their performance excellence and sustainable attributes.

Please accept the following comments under 15-BSTD-04:

2016 Draft Residential Alternative Calculation Method (ACM) Reference Manual
- 2.2.3 PV System Credit
  1. Provide specific language that: (1) limits the PV credit to a minimum size (watt output) that is consistent with language in the Residential Compliance Manual and with the analysis to develop the PV tradeoff credit; and (2) limits the use of the PV credit to only unit-by-unit compliance analysis for multifamily buildings. Analysis supporting the PV credit was based on a system having 2 kW minimum watts of output. These criteria must be reflected in language of the manual to insure accuracy of compliance modeling, design and installation, and third-party verification of system dynamics. Additionally, to insure that savings from efficiency and renewable measures are realized by occupants of multifamily buildings, particularly low-income families, it is imperative that compliance only is allowed to be demonstrated on a unit-by-unit basis as opposed to using whole-building compliance. Net metering for whole buildings discriminates the transference of energy savings to individual unit occupants.

     The compliance credit available for photovoltaic (PV) systems is dependent on the climate zone and dwelling unit size. The credit may be used to tradeoff any efficiency measure, with limits as described below. The PV system must meet the eligibility requirements of Residential Appendix RA4.6.1, the minimum PV system size for compliance credit shall be 2 kW or greater and must meet the minimum system size, and can only be used with unit-by-unit building compliance analysis of multifamily buildings.

     The PV compliance credit for both single and multi-family buildings is calculated by the compliance software and is equal to:

     *Equation 1: PVcredit = TDVstd * PVmaxpct / 100.0*

     Where:
     PVcredit = PV compliance credit (kTDV/ft2)
     TDVstd = Standard Design Compliance Total (kTDV/ft2)
     PVmaxpct = Maximum PV Credit Percentage from Table 2-1

The minimum PV system size for compliance credit is calculated by the compliance software and is equal to:
*Equation 2: PVminsize = ROUND((PVthreshold + PVaddedsize) * Ndwellingunits, 0.1)*

~~For average dwelling units less than or equal to CFAthreshold:~~
~~*Equation 3: PVaddedsize = 0*~~

~~For average dwelling units larger than CFAthreshold:~~
~~*Equation 4: PVaddedsize = PVcredit * (CFAdwellingunit – CFAthreshold) /*~~ *PVgenrate*

Where:
PVminsize = Minimum PV System Size (kWdc) for compliance credit
PVthreshold = Threshold PV System Size per dwelling unit (kWdc) from Table 2
Ndwellingunits = Number of dwelling units
PVaddedsize = Added PV System Size (kWdc) required
~~CFAdwellingunit = Average Conditioned floor area per dwelling unit (ft2)~~
~~CFAthreshold = Average Threshold Conditioned floor per dwelling unit (ft2) from Table 2~~
PVgenerate = PV Generation Rate (kTDV/kWdc) from Table 1

If the PV size entered by the user is less than PV minimum size then there is no compliance credit:
Equation 5: PVcredit = 0 when PVusersize< PVminsize

Where:
PVminsize = Minimum PV System Size (kWdc) for compliance credit
PVusersize = PV size entered by user (kWdc)

Table 2-2: PV Threshold Factors

Dwelling Type	PV threshold (kWdc)	CFA threshold (ft2)
Single Family	2.0	2000
Multifamily (unit-by-unit)	1.0	1000

For the design ratings, the user entered system size is used to calculate the system output. [Energy Design Ratings NOT YET IN CBECC-Res ALPHA VERSION]

*Equation 6: PVdesignratingcredit = PVusersize * PVgenrate / CFAdwellingunit*

Where:
PVdesignratingcredit = PV design rating credit (kTDV/ft2)
PVusersize = PV size entered by user (kWdc)
PVgenerate = PV Generation Rate (kTDV/kWdc) from Table 1
~~CFAdwellingunit = Average Conditioned floor area per dwelling unit (ft2)~~

If the design rating goes below zero when the solar credit is applied, the design rating is set to zero.

2. Proposed Design

The software allows the user to input the rated power output of the solar system in kilowatts DC. If the rated system is greater than or equal to the minimum PV system size, the software calculates the solar credit and subtracts it from the proposed design. If the rated system is less than the minimum
PV system size, the software sets the solar credit to zero and displays a message to the user that the minimum PV system size criteria was not met and displays third-party verification information related to requirements of the NSHP.

Sincerely,

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