

RESPONSE TO PUBLIC COMMENT, MARCH 12, 2012  
HEARING, NONRESIDENTIAL

Sections of the Proposed Standards to Which Comment is Relevant	Summary of the Comment	Did the Energy Commission Make the Recommended Changes to the Proposed Standards?	The Commission's Response to the Comment
Section 140.3(b) & Table 141.0-B	Mr. Callahan is requesting an alternative compliance trade-off for cool roof vs. insulation by adding additional insulation below the roof deck. Currently insulation can be added above but not below the roof deck. They have lost this alternative since CEC removed the overall energy TDV approach in Section 140.3(b).	Yes	CEC Staff agrees and has provided a table, Table 141.0-B which is based on aged solar reflectance vs. Insulation down to aged solar reflectance of 0.25. The insulation values are not R-value, they are in U-factor to allow insulation to be placed above or below on different type of roof deck assembly. Also the Overall Energy TDV approach has not been deleted from the STD, but it has been moved under the Non.Res ACM to be designed properly
Section 140.3(b) & Table 141.0-B	Mr. Hitchcock concurs with Mr. Callahan's comments from pages 42 to 50.	Yes	CEC Staff agrees and has provided a table, Table 141.0-B which is based on aged solar reflectance vs. Insulation down to aged solar reflectance of 0.25. The insulation values are not R-value, they are in U-factor to allow insulation to be placed above or below on different type of roof deck assembly. Also the Overall Energy TDV approach has not been deleted from the STD, but it has been moved under the Non.Res ACM to be designed properly.
Section 140.3(b) & Table 141.0-B	Mr. Bacchus is commenting on the request by Mr. Callahan for a compliance option to trade-off altered roof aged solar reflectance requirement by adding additional insulation. His point is that allowing this tradeoff can be made energy neutral, but may still have a societal impact due to the urban heat island effect.		This proposal may not change the urban heat island effect, but it will still reduce the carbon emission as less energy is used to cool the building down.

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Section 140.3(b) & 141.0(b)1B	MS. DICKIE: Amy Dickie from the Global Cool Cities Alliance supports the new regulations and supports the comments from Mr. Bacchus form NRDC about considering urban heat island effect when considering tradeoffs to roof aged solar reflectance.		No Response needed
Section 140.3(a)1Ai & 141.0(B)Bi	Mr. Hitchcock comments that the CEC is concerned with energy consumption and not the societal impact due to the urban heat island effect. He also mentions a Stanford University report on the relationship between cool roofs and urban heat island effect.	No	CEC staff does have a mission for both. Also, the Stanford University report on the relationship between cool roofs and urban heat island effect is not true. The modeling used for the study has many uncertainties around its findings. This is only one paper but there are papers from LBNL that gets deep into the cool roof and heat island effects
Section 140.3(a)1Ai & 141.0(B)Bi	Mr. Calkins is against changes to the Prescriptive Title-24 requirements. He claims that the benefits have not been quantified. He also requested that staff standardize the reflectivity requirement to 0.63 for both new construction and alterations.	Yes	Consultant to the CASE team have quantified the benefits by conducting a cost study. Also, CEC staff did standardize the solar reflective requirement to 0.63 for both new construction and alterations to reduce the confusion which may happen in the industry.
Section 140.3(a)1Ai & 141.0(B)Bi	Mr. Contoyannis is commenting on Mr. Calkins claim that the benefits have not been quantified page 56-59. Mr. Contoyannis states that all new proposed measures have been tested and meet the cost effectiveness requirements.		No Response needed
Section 140.3(a)1Ai & 141.0(B)Bi	Mr. Cottrell from the North American Insulation Manufacturers supports the new standards. However he encourages the CEC to work with the roofing industry to resolve their concerns pertaining to cool roof issues.		We are and we have been

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<p>Section 140.3(a)1Ai &amp; 141.0(B)Bi</p>	<p>Mr. Callahan is concerned about the cost study AEC has done to get the cost effectiveness. He is concerned about the number of responses and the installed cost data used in the study. He reiterates his request for a tradeoff for Aged Solar Reflectance requirement. In addition he comments on whether it would be more cost effective to improve compliance with the current standards than to implement the 2013 standards.</p>	<p>No</p>	<p>AEC consultants to the CEC used a rigorous calculation methodology to demonstrate cost effectiveness. Also, AEC reached out to 70 roofing contractors up and down the state using the National Roof Contractors Association online site. Contractors were within a 50-75 mile radius of 7 metro areas: SF, San Jose, Sacramento, LA, SD, Fresno, and San Bernardino. AEC worked with ARMA to develop the survey and AEC informed the contractor of the survey being conducted for the Building STD. 3 contractors responded by e-mail. AEC also conducted a phone survey to capture more costs. Roofing contractors do not install all types of roofs. Contractors have specialties in the types of roofs they install and provided the information they had. -- Table 141.0-B, the Aged Solar Reflectance Trade-off Table will be edited to allow insulation to be installed above or below the roof deck and the Overall Energy TDV approach will also be available but just in a different format. The CEC is also mandated to move forward to a net Zero Building. To meet this criteria CEC cannot wait until the 2016 STD to make the changes.</p>
<p>Section 140.3(a)1Ai &amp; 141.0(B)Bi</p>	<p>Mr Hithcock on Asphalt Roofing Manufacturers Association concerned about the limited data in the Aged Solar Reflectance cost effectiveness report. He said that he offered assistance but collecting the data would take a considerable amount of time. Mr. Raymer: made a comment that in the case study meetings held in the April, May and June time period they were the only private sector group present and the rest were energy consultants to the Energy Commission.</p>		<p>The methodology by which the simulations were prepared are clearly documented in the case report. The results clearly demonstrate that cool roof proposal leads to energy savings and TDV energy savings. The methodology by which cost-effectiveness is calculated is also available on the CEC website, and that cost-effectiveness methodology, as I mentioned before, is there, it's available, all the case reports use that same methodology. Regarding Mr. Raymers comment, looking at the June 1, 2011 key representative of the roofing industry were present at the meeting as well as roofing manufacturers.</p>
<p>Section 140.3(a)1Ai &amp; 141.0(B)Bi</p>	<p>Mr. Arent of the CEC provides some specifics on the effort to collect cost data for the cool roof cost effectiveness report. He also provided some insight as to why the aged solar reflectance was different for new construction and alterations.</p>		<p>Mr. Arent just trying to outline how he got cost .</p>

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Section 140.3(a)1Ai & 141.0(B)Bi	Mr. Callahan clarifies the stakeholder meeting date was June 10th and comments that it was between the time period given by Ms. Chappelle (Heschong Mahone Group) and Mr. Hitchcock (Asphalt Roofing Manufacturers ).		This is not a comment directed at the regulations or the process by which they were adopted.
Section 140.3(a)1Ai & 141.0(B)Bi	Mr. Shirakh of the CEC concurs with the date given in the previous comment by Mr. Callahan and clarifies the type of meeting as a staff workshop. He says that he will contact Ms. Chappelle (Heschong Mahone Group) and ask her to provide specific dates that cool roof requirements were presented and who was contacted.		This is not a comment directed at the regulations or the process by which they were adopted.
Section 140.3(a)1Ai & 141.0(B)Bi	Mr. Contoyannis of AEC explains the procedure for how the analysis was done on the cool roof to make it cost effective.		This is not a comment directed at the regulations or the process by which they were adopted.
Section 140.3(a)1Ai & 141.0(B)Bi	Mr. Callahan provides information on the actual date of the cool roof stakeholder meeting. It was held on June 1st, 2011 the last meeting of the stakeholder process. He comments again on the short timeline for his industry to respond.		AEC was working on the cost effectiveness and gathering data before presenting cost effectiveness.
Section 140.3(a)1Ai & 141.0(B)Bi	Mr. Hitchcock reads letters from 14 trade associations outlining their concerns about the changes to the cool roof requirements. The letter was submitted to the docket and staff responded. Does not believe cost effective and energy analysis supports proposed revisions to solar reflectances.		Staff believes proposed solar reflectance values are cost effective and energy savings can be achieved by products currently being sold in the market. Staff has revised its solar reflectance values subsequent to this letter and has included insulation tradeoffs as an optional item to the proposed Standards.

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<p>Section 140.3(a)1Ai &amp; 141.0(B)Bi</p>	<p>Mr. Hitchcock representing the roof industry and Mazi from the CEC are discussing the timeline and the Proposal CEC staff did to the roofing industry for cost effectiveness. Mazi proposed that we go back to the 2001 STD and now see if it is cost effective to have a cool roof to the current proposed ratings.</p>		<p>This is not a comment directed at the regulations or the process by which they were adopted.</p>
<p>Section 140.3(a)1Ai &amp; 141.0(B)Bi</p>	<p>Ms. Hardy Pierce of GAF roofing states that her company fully supports the letter mentioned in previous comment by Mr. Hitchcock. In addition she expresses concern about focusing on the irradiative properties of roofing material. She cites some cases of moisture problems in San Diego directly attributed to changing the roofing's irradiative properties. She mentions a report by Phil Dregger in February issue of Western Roofing that reports similar problems. Ms. Hardy Pierce recommends that the CEC consider more than the irradiative properties of the roofing membrane.</p>		<p>CEC staff provided an insulation tradeoff vs. Cool Roof trade off table. The values of the table are U-factor VS. aged solar reflection. U-factor was set to allow the insulation to be placed above or below the roof deck and be able to take thermal credit for all components of the roof. If the contractor feels he needs to be concerned with moisture then he can properly locate the insulation and still be able to take the thermal efficiency credit.</p>
<p>Section 140.3(a)1Ai &amp; 141.0(B)Bi</p>	<p>Ms. Dickey of the Global Cool Cities Alliance offers additional information on the Stanford University paper mentioned by Mr. Hitchcock on page 55, about the relationship between cool roofs and urban heat island effect. Ms. Dickey says that the Stanford paper shows that their modeling has a very wide range of uncertainty around this finding, and it is very dependent on assumptions, to the point where the authors basically say that "our findings are that there is an inclusive impact of cool roofs on global cooling" But the paper does support that cool roofs has many benefits.</p>		<p>This is not a comment directed at the regulations or the process by which they were adopted. It is a comment about the evidence in the record.</p>

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Section 140.3(a)1Ai & 141.0(B)Bi	Mr. Ferraro of the Roof Coating Manufacturers Association states their position that CEC should not change the roof solar reflectance for this code cycle. He is also concerned about the number of responses and the installed cost data used in the study. He Claims that the CEC is focusing more on peak reduction than overall energy savings.	No	The analysis was done based on the Time Dependent valuation to do cost-effective analysis.
Section 140.3(a)1Ai & 141.0(B)Bi	Mr. Hitchcock from ARMA comments that CEC staff acknowledged that the 2002 report from Berkeley was flawed and that this information had been relied upon for the 2005 and 2008 energy code. CEC should not pursue a higher aged solar reflectance in 2013 and stay back to 2008 STD requirements. ARMA believes that the Study done by AEC is flawed, CEC has limited the number of roof types that can be now used in California.		Contrary to the comment, Commission staff has never acknowledged that the 2002 report from Berkeley was flawed. The study done by AEC on cool roof does provide the proper information to validate the cost effectiveness of the standard for the low-sloped roofs. Also, an insulation vs.cool roof tradeoff table is provided for both new and additions and alterations.
Section 140.3(a)1Ai & 141.0(B)Bi	Mr. Callahan comments that from his point of view the 2013 standards rulemaking process feels anti-collaborative. He reiterates his concern about having two different standards for cool roof for new construction and alterations. He concurred with Phil Dregger's paper outlining the potential for additional roof insulation to cause moisture problems.	Yes	CEC staff have provided a insulation tradeoff vs. Cool Roof trade off table. the values of the table are U-factor VS. aged solar reflection. U-factor was set to allow the insulation to be place above or below the roof deck and be able to take thermal credit for all components of the roof. If the contractor feels he needs to be concerned with moisture than he can properly locate the insulation and still be able to take the thermal efficiently credit. Staff also are providing the over all Energy TDV approach under the ACM Manual at a later time.

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<p>Section 140.3(a)1Ai &amp; 141.0(B)Bi</p>	<p>Ms. Hardy adds more specific concerns about the required insulation levels required to tradeoff the lower valued aged solar reflectance.</p>		<p>The regulations contain a trade-off table in the performance approach for utilizing varying levels of insulation and cool roof characteristics (i.e., reflectance). The values in the table allow tradeoffs between U-factor and aged solar reflectance. U-factor was set to allow the insulation to be placed above or below the roof deck and be able to take thermal credit for all components of the roof. Insulation should be installed appropriately, considering the design and location of the structure, to avoid moisture concerns. In addition, it is anticipated that guidance will be provided in the Alternative Calculation Method manual for using the over all Energy TDV approach to demonstrate compliance.</p>
<p>Section 140.3(a)1Ai &amp; 141.0(B)Bi</p>	<p>Mr. Arent of the CEC explains how the tradeoff insulation values were derived. He comments on the why and where the cost data came from for the roof coating cost effective study. Lastly, he clarifies the fact that no manufacture's product is eliminated by this requirement because none of these requirements are mandatory measures. The industry has the option to show compliance using the performance method if they cannot achieve compliance using the prescriptive method.</p>		<p>This is not a comment directed at the regulations or the process by which they were adopted.</p>
<p>140.3(b) &amp; 141.0(B)Bi</p>	<p>Mr. Peter Hart an attorney here on behalf of the Asphalt Roofing Manufacturers Association had a question about when the tradeoff calculations and approaches will be made public. He also wanted to know when the language and the calculations would be available to stakeholders.</p>		<p>Guidance on the tradeoff calculations and approaches will be provided in the Alternative Calculation Method manual developed following this rulemaking.</p>

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<p>Section 140.3(b) &amp; Table 141.0-B</p>	<p>Mr. Callahan requests an alternative compliance trade-off for cool roof vs. insulation by adding additional insulation below the roof deck. Under the 45-day language, insulation could be added above but not below the roof deck; this was different from the previous standards, which used an overall energy TDV [time-dependent valuation] approach in Section 140.3(b). Mr. Callahan also expressed concern with relying on a yet-to-be-adopted compliance manual for the trade-offs that were previously in the code.</p>	<p style="text-align: center;">Yes</p>	<p>The Commission accepted the proposed change and, in 15-day language, added below-deck insulation as tradeoffs for cool roofs and provided a table, Table 141.0-B, which is based on aged solar reflectance vs. insulation down to aged solar reflectance of 0.25 (thus allowing tradeoffs between the two). In addition, the insulation values were changed from R-values to U-factor, which allows insulation to be placed above or below on different types of roof deck assembly, as requested by the commenter. U-factor is defined as the overall coefficient of thermal transmittance of a construction assembly, in Btu/(hr. x ft.<sup>2</sup> x °F), including air film resistance at both surfaces; and R-value is defined as the measure of the thermal resistance of insulation or any material or building component expressed in (ft<sup>2</sup>-hr °F)/Btu. (2013 Reference Joint Appendices, Appendix JA1 - Glossary, pp. JA1-56, JA1-65.)</p> <p>The Overall Envelope Approach based on time-dependent valuation (TDV) was moved from the Standards and placed in the Nonresidential Alternative Calculation Method (ACM), which is adopted in a separate proceeding and which provides guidance on complying with the performance standards (as opposed to the prescriptive cool roofs standards). The reason for this move was to provide a more simplified and automated calculation approach.</p>
<p>Section 140.3(b) &amp; Table 141.0-B</p>	<p>Mr. Hitchcock concurs with Mr. Callahan's comments from pages 42 to 50 of the March 12, 2012 transcript, including expressing concern about moving the trade-offs to the Alternative Compliance Manual and not being able to comment on them as part of the standards.</p>	<p style="text-align: center;">Yes</p>	<p>This comment reiterates Mr. Callahan's comments at the hearing from pages 42-50 of the March 12, 2012 transcript. The Commission has responded to that comment above, and incorporates that response here.</p>

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<p>Section 140.3(b) &amp; Table 141.0-B</p>	<p>Mr. Bacchus states that allowing a tradeoff between roof reflectance and insulation can be made energy neutral, but may still have a societal impact due to the urban heat island effect (where cities are hotter because roofs are made less reflective). Mr. Bacchus notes that the analyses supporting the regulations do not account for all the benefits of the regulations, such as reducing urban heat island effects.</p>	<p>No.</p>	<p>An urban heat island effect is where there is a localized temperature increase from an area with less reflective roofs that absorb heat. A reflective roof, in contrast, prevents this localized effect, resulting in urban cooling. The Commission did not consider the urban heat island effect in setting the aged solar reflectance requirement or in establishing tradeoffs between insulation and aged solar reflectance, because there is insufficient data in the record to support quantifying the urban heat island effect in terms of energy costs or savings. Rather, the Commission based the standard and the tradeoffs on the cost-effectiveness of the measures and the energy savings to the building. The Commission notes, however, that the aged solar reflectance standard will still reduce carbon emissions as less energy is used to cool the building down, which was considered as part of the initial study prepared under the California Environmental Quality Act.</p>
<p>Section 140.3(b) &amp; 141.0(b)1B</p>	<p>Ms. Dickie expresses support for the new regulations and supports the comments from Mr. Bacchus about considering urban heat island effect when considering tradeoffs to roof aged solar reflectance.</p>	<p>N/A, No.</p>	<p>This comment in part supports the standards and does not request changes to the standards. To the extent that Ms. Dickie is requesting that the Commission consider urban heat island effects, the Commission incorporates its response to Mr. Bacchus, above.</p>
<p>Section 140.3(a)1Ai &amp; 141.0(B)Bi</p>	<p>Mr. Hitchcock comments that the CEC is concerned with energy consumption and not the societal impact due to the urban heat island effect. He also recommends a Stanford University report on the relationship between cool roofs and urban heat island effect.</p>	<p>N/A</p>	<p>As described above, the Commission did not consider the societal impact from the urban heat island effect in setting the aged solar reflectance standard or insulation tradeoffs.</p>

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<p>Section 140.3(a)1Ai &amp; 141.0(B)Bi</p>	<p>(A) Mr. Calkins opposes changes to the prescriptive requirements for roofs because: (1) the Commission lacks evidence to show quantifiable benefits from adopting changes, and (2) the changes will cause significant market disruption from untested products rushing to market without proper long-term testing.</p> <p>(B) Mr. Calkins requests that staff standardize the reflectivity requirement to 0.63 for both new construction and alterations.</p> <p>(C) Mr. Calkins requests that staff apply the insulation tradeoffs to both new construction and alterations.</p>	<p>No/Yes/Yes</p>	<p>(A) The Commission disagrees that the adopted standards lack evidence of benefits or that the changes will cause significant market disruption. (1) The Commission determined that the cool roofs standards have a cost effectiveness of between \$0.40/sq ft and \$1.35/sq ft and provide statewide energy savings of approximately 47 gigawatt hours (GWh). (CASE Report, Nonresidential Cool Roofs (Oct. 2011), at pp. 3, 27; see also Architectural Energy Corporation, <i>Non-Residential Cool Roof Cost Summary</i> (Feb. 8, 2012), at p. 4 (also finding the standards cost-effective).) The Commission also found that the adopted standards would reduce greenhouse gas and toxic air emissions reduction, resulting in air quality benefits. (California Energy Commission, Initial Study/Proposed Negative Declaration for the 2013 Building Energy Efficiency Standards for Residential and Nonresidential Buildings (Mar. 2012), Pub. No. CEC-400-2012-002, at p. 55.) These quantified benefits support adopting the standards. (2) The Commission relies on the ASTM standards and on warranties set by the manufacturers for different years of service depending on the product. The comment does not provided any data to support the assertion that untested products will enter the market or cause market disruption. The existing industry safeguards will continue to protect the industry. Therefore, no changes are appropriate.</p> <p>(B) In 15-day language, the Commission changed the aged solar reflectance</p>
<p>Section 140.3(a)1Ai &amp; 141.0(B)Bi</p>	<p>Mr. Contoyannis is commenting on Mr. Calkins claims that the benefits have not been quantified page 56-59. Mr. Contoyannis states that all new proposed measures have been tested and meet the cost effectiveness requirements.</p>	<p>N/A</p>	<p>This comment supports the standards and does not request changes to the standards.</p>

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<p>Section 140.3(a)1Ai &amp; 141.0(B)Bi</p>	<p>Mr. Cottrell from the North American Insulation Manufacturers supports the new standards. However he encourages the CEC to work with the roofing industry to resolve their concerns pertaining to cool roof issues. Mr. Cottrell also recommends expanding the tradeoffs to other systems to improve the overall usage and user-friendliness of the standards.</p>	<p style="text-align: center;">N/A</p>	<p>This comment supports the standards and does not request changes to the standards. Regarding the expansion of tradeoffs, the Commission's staff has been working with the roofing industry to resolve issues in expanding tradeoffs to other systems. The Commission notes that the tradeoffs were made available to both new roofs and alterations in 15-day language. (See Proposed 2013 Building Efficiency Standards, Pub. No. CEC-400-2012-004-15 DAY (May 2012) at pp. 190, 265.)</p>
<p>Section 140.3(a)1Ai &amp; 141.0(B)Bi</p>	<p>(A) Mr. Callahan is concerned about the survey AEC has done to get the cost effectiveness for the cool roof standards, arguing that: (1) the survey sample of 12 responses (compared to 5,000 licensed contractors in California) is too small to be statistically significant; (2) the survey data is incomplete (the table is not filled in for all responses); and (3) the wage data seems inaccurate when compared to existing prevailing wage (as the survey results appear to show that union contractors cost <i>less</i> than non-union contractors).</p>	<p style="text-align: center;">No</p>	<p>(A) The cost data and analysis conducted by Architectural Energy Corporation (AEC) includes a range of roofing products used in nonresidential construction and is representative of both market and geographic differences. AEC reached out to 70 roofing contractors in the state through the National Roof Contractors Association website. The contacted contractors were within a 50-75 mile radius of 7 metropolitan areas: San Francisco, San Jose, Sacramento, Los Angeles, San Diego, Fresno, and San Bernardino. AEC worked with ARMA to develop the survey. As a result of these efforts, 3 contractors responded by e-mail. AEC then conducted a phone survey to capture more costs. (See Comment from John Arent, AEC, Workshop Tr. at p. 116 (Mar. 12, 2012) (explaining this process).) Thus, every effort was made to ensure that the collected cost information was of sufficient breadth to draw reasonable conclusions upon. Despite numerous requests for and opportunities to submit data to help inform this analysis, ARMA did not provide any data or information on nonresidential roofing products.</p> <p>To specifically respond to Mr. Callahan's criticisms: (1) The cost-</p>

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<p>Section 140.3(a)1Ai &amp; 141.0(B)Bi</p>	<p>(B) Mr. Callahan requests that the CEC not remove the overall energy TDV approach, which does not require the purchase of software to comply with.</p> <p>(C) The tradeoffs table in the standards for retrofits that says "insulation requirements are in lieu of" should read "in addition to" and refer to Table 140(C).</p> <p>(D) It would be more cost effective to improve compliance with the current standards than to implement the 2013 standards.</p>	<p>No/No/Yes</p>	<p>(B) The Commission edited Table 141.0-B, the Aged Solar Reflectance Trade-off Table, to allow insulation to be installed above or below the roof deck, which addresses the underlying issue regarding "removing" the overall energy TDV approach. Moreover, the Overall Energy TDV approach will remain available through the Nonresidential Alternative Compliance Method, to be adopted at a later time.</p> <p>(C) The Commission made this change in 15-day language by revising the Table and adding a mandatory insulation standard. (See Proposed 2013 Building Efficiency Standards, Pub. No. CEC-400-2012-004-15 DAY (May 2012) at pp. 263, 266.)</p> <p>(D) The Commission disagrees for the reasons stated in its response to Comment 9 (Docket No. 64156), which it incorporates here.</p>
<p>Section 140.3(a)1Ai &amp; 141.0(B)Bi</p>	<p>Mr Hitchcock is concerned that the Commission did not spend enough time collecting data for the Aged Solar Reflectance cost effectiveness report, where the Commission took three months, but data collection would take more time. He explained that they are not keeping data from the Commission, but that they just don't have it.</p>	<p>/No</p>	<p>The process to collect cost data to support the standards began in early 2010, and stakeholders had since then to submit data reflecting the costs of standards, even if changes to the roofing standard were not proposed until June 2011. However, with roofing contractors and manufacturers going out of business or leaving the state, it was more difficult to obtain cost data than in previous years. (March 12, 2012 Transcript, at p. 113.) Nonetheless, the Commission obtained cost information through the AEC survey that reflected a reasonable range of roofing products from contractors throughout the state. The CASE Report on nonresidential cool roofs used a different source for cost information, RS Means®, and also concluded that the cool roof standard was cost-effective. This data is substantial and supports the adopted aged roof reflectance standards as cost-effective.</p>

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<p>Section 140.3(a)1Ai &amp; 141.0(B)Bi</p>	<p>Mr. Raymer explains that the economy makes it more difficult to get the cost data (because contractors are out of business) than in any previous version of the standards, not that industry is unwilling to provide the data. Mr. Raymer also explains that industry is not well represented at technical workshops (which are mostly government sector participants) because the workshops take too much time and are very technical.</p>	<p style="text-align: center;">N/A</p>	<p>This comment does not request changes to the regulations. The Commission agrees that it is difficult to obtain the cost data, and that the Commission used every means it had in the time available to obtain the cost data necessary to establish cost-effective standards. Regarding industry participation in workshops, the Commission notes that key representatives of the roofing industry participated in technical workshops, both before and during the rulemaking.</p>
<p>Section 140.3(a)1Ai &amp; 141.0(B)Bi</p>	<p>Ms. Chapelle states that the process to collect data began in early 2010, and agrees that contractors and manufacturers going out of business or leaving the state made it more difficult to get data than in previous years.</p>	<p style="text-align: center;">N/A</p>	<p>This comment supports the regulations and does not request changes to the regulations.</p>
<p>Section 140.3(a)1Ai &amp; 141.0(B)Bi</p>	<p>Mr. Arent of AEC describes the effort to collect cost data for the cool roof cost effectiveness report. He also explained why the aged solar reflectance was different for new construction and alterations.</p>	<p style="text-align: center;">N/A</p>	<p>This comment supports the regulations and does not request changes to the regulations.</p>
<p>Section 140.3(a)1Ai &amp; 141.0(B)Bi</p>	<p>Mr. Callahan clarifies the stakeholder meeting date was June 10th [2011] and comments that it was between the time period given by Ms. Chappelle (Heschong Mahone Group) and Mr. Hitchcock (Asphalt Roofing Manufacturers ).</p>	<p style="text-align: center;">N/A</p>	<p>This comment does not address the regulations or the process by which they were adopted. Rather, they address pre-rulemaking activities. Therefore, no response is necessary. However, the Commission notes that the correct date, as Mr. Callahan clarifies later, was June 1, 2011.</p>

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Section 140.3(a)1Ai & 141.0(B)Bi	Mr. Contoyannis of AEC explains the methodology for how the cost-effectiveness analysis was done for the cool roof standards.		This comment supports the regulations and does not request changes to the regulations.
Section 140.3(a)1Ai & 141.0(B)Bi	Mr. Callahan provides information on the actual date of the cool roof stakeholder meeting on June 1, 2011 when the Commission first suggested changing the standards. He comments that this was too short a timeline for adequate stakeholder input.		This comment does not address the regulations or the process by which they were adopted. Rather, the commenter is concerned with the amount of time before the rulemaking to raise concerns with the Commission. Therefore, no response is necessary. However, the Commission notes that stakeholders had ample time between the June 1, 2011 workshop and the May 10, 2012 adoption date to raise concerns about or gather data on the proposed regulations.
Section 140.3(a)1Ai & 141.0(B)Bi	Mr. Hitchcock reads a letter from 14 trade associations outlining their concerns about the changes to the cool roof requirements. (The letter was submitted to the docket as Docket No. 64156 (Mar. 9, 2012) and is responded to in this Response to Comments.)		The Commission responded to the specific concerns raised in the letter dated March 9, 2012 (Docket No. 64156, Comment No. 9) in its response to that written comment, and incorporates that response here.

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<p>Section 140.3(a)1Ai &amp; 141.0(B)Bi</p>	<p>(A) Mr. Hitchcock explains that he offered to work with the Commission to get current, good, real information (in lieu of the 2002 Report by Lawrence Berkeley National Lab on which the Commission relied for its baseline costs for the roofing industry), but that it would take some time.</p> <p>(B) Mr. Hitchcock argues that using the 2002 Report, which [he alleges] Commission staff admitted was "wrong," is insufficient to support the baseline costs, but also argues that using "pre-standards" costs to determine cost-effectiveness also did not work.</p> <p>(C) Mr. Hitchcock complains that the Commission has not responded to all comments, but only "picks and chooses" which comments to respond to.</p>	<p>No.</p>	<p>(A) The Commission first set cool roof standards in 2005, the proposed adjustment to the standards for cool roofs were presented in June 2011, and the standards were not adopted until May 2012. At any time during this process, stakeholders like ARMA could have, but did not, collect or provide to the Commission information on costs and benefits of the proposed standards. To obtain this information, the Commission's consultant, Architectural Energy Corporation (AEC), instead surveyed the industry on costs and feasibility of the standard during this timeframe. The CASE Report on <i>Nonresidential Cool Roofs</i> also obtains cost information in this time period, using RS Means® data (a source of industry data generally used in the trade). Both the AEC Report and the CASE Report demonstrate that the standards are cost-effective.</p> <p>(B) The Commission responds to Mr. Hitchcock's argument about the 2002 report prepared by the Lawrence Berkeley National Laboratory in its Response to Comment number 6a (Docket No. 64149), part (A)(1), and incorporates that response here.</p> <p>(C) During the rulemaking, the Commission provided and responded to comments to encourage productive dialogue. However, the Commission is only legally required to prepare a formal response to comments in this Final Statement of Reasons pursuant to Gov. Code section 11346.9, subd. (3), and has met that requirement here.</p>
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<p>Section                  140.3(a)1Ai                  &amp;                  141.0(B)Bi</p>	<p>Ms. Hardy Pierce recommends making no change to the 2008 Standards for Nonresidential Roofing because: (1) they fully support the Roofing Industry Coalition letter submitted herein; and (2) the Commission needs to do further research before changing the irradiative properties of the roofing membrane, which has led in some cases to moisture problems in San Diego. Ms. Hardy Pierce refers to a report by Phil Dregger in the February issue of <i>Western Roofing</i> that reports similar problems.</p>	<p>No.</p>	<p>The standards are both cost-effective and technologically feasible, and will result in significant energy savings. CASE Report, Nonresidential Cool Roofs (Oct. 2011); see also Architectural Energy Corporation, Non-Residential Cool Roof Cost Summary (Feb. 8, 2012).) In contrast, failing to adopt the standards and the proposed cool roof requirement would result in lost energy savings, making them less effective at achieving the goals of the Warren-Alquist Act. The Commission notes that the tradeoffs permitted under the standards may be used to avoid the identified moisture problems, as contractors may increase insulation in lieu of increasing the aged solar reflectance of the roof. However, to address the concern that higher solar reflectance values could cause performance issues from moisture, the Commission added a mandatory requirement for minimum roof insulation in 15-day language. (See Proposed 2013 Building Efficiency Standards, Pub. No. CEC-400-2012-004-15 DAY (May 2012) at p. 155 (new roofs), 263 (alterations).) This mandatory insulation requirement will help thermal dynamic assemblies perform properly under different ambient conditions, including moisture.</p>
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<p>Section 140.3(a)1Ai &amp; 141.0(B)Bi</p>	<p>Ms. Dickey of the Global Cool Cities Alliance offers additional information on the Stanford University paper mentioned by Mr. Hitchcock on page 55 of the March 12, 2012 Transcript, about the relationship between cool roofs and urban heat island effect. Ms. Dickey says that the Stanford paper shows: (1) that cool roofs have energy savings at the building level, (2) that cool roofs reduce local temperatures, and (3) that cool roofs may have a slight warming effect on a global basis. However, this slight warming effect is based on modeling that has a very wide range of uncertainty and is dependent on the assumptions that are made. Other papers contradict this third finding.</p>	<p style="text-align: center;">N/A</p>	<p>This comment does not address the regulations or the process by which they were adopted. Rather, they address a report on cool roofs that the Commission did not rely upon to propose the standards. This comment is also supportive of the proposed regulations and does not request changes to the proposed regulations. No further response is necessary.</p>
<p>Section 140.3(a)1Ai &amp; 141.0(B)Bi</p>	<p>Mr. Ferraro states that the CEC should not change the roof solar reflectance for this code cycle because: (1) the baseline costs used to support the proposed standard do not reflect real world costs because they are based on the flawed data used to support the existing 0.55 aged reflectance standard; (2) the AEC cost analysis for cool roofs is flawed because it contains little cost data and that data has not been verified for accuracy; and (3) the Commission inappropriately considers peak energy savings instead of overall energy savings to set the standards.</p>	<p style="text-align: center;">No</p>	<p>The Commission disagrees: (1) The Commission understands Mr. Ferraro to be questioning the validity of the 2002 Lawrence Berkeley National Laboratory Report that was relied upon to establish a cool roof standard for the 2005 Building Standards. The Commission has responded to a similar comment by the Roofing Coating Manufacturerers Association, Comment number 6a (Docket No. 64149), part (1), and incorporates that response here.</p> <p>(2) The Commission has responded in detail to comments regarding the AEC cost analysis. The Commission thus incorporates its response to Comment 6a, parts (2), (3), and (5), here.</p> <p>(3) The Commission responded to this argument about "peak" energy savings in its response to the Comment from Roof Coating Manufacturerers Association (Comment No. 7, Docket No. 64150 (Mar. 12, 2012), and incorporates that response here.</p>

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<p>Section 140.3(a)1Ai &amp; 141.0(B)Bi</p>	<p>Mr. Hitchcock makes the following comments:</p> <p>(A) CEC staff acknowledged that the 2002 report from Lawrence Berkeley National Laboratory was flawed and that this information had been relied upon for the baseline assumptions for the 2005 and 2008 building efficiency standards. The CEC should not pursue a higher aged solar reflectance in 2013 because it is based on the same "bad science" as the 2005 and 2008 standards and therefore not cost-effective; instead, the CEC should retain the 2008 aged solar reflectance requirement for low-slope nonresidential roofs of 0.55.</p> <p>(B) The CEC should not have rushed the cost-effectiveness analysis. As a result of rushing it, the AEC cost-effectiveness analysis is flawed because it only has 12 responses. The standard based on this flawed analysis will result in taking 29% of roofing products off of the market.</p> <p>(C) The CEC should not move the trade-offs to the ACMs.</p> <p>(D) Cool roofs should be an alternative to insulation requirements, not a requirement themselves.</p>	<p>No/No/Yes/Yes</p>	<p>(A) The Commission has not acknowledged that the 2002 Lawrence Berkeley National Laboratory report is flawed. The Commission has provided a detailed response to criticisms of the 2002 Report in its response to Comment 6a, Docket No. 64149, and incorporates that response here.</p> <p>(B) The process to collect cost data to support the standards began in early 2010, and stakeholders had since then to submit data reflecting the costs of standards, even if changes to the roofing standard were not proposed until June 2011. However, with roofing contractors and manufacturers going out of business or leaving the state, it was more difficult to obtain cost data than in previous years. (March 12, 2012 Transcript, at p. 113.) Nonetheless, the Commission obtained cost information through the AEC survey that reflected a reasonable range of roofing products from contractors throughout the state. The CASE Report on nonresidential cool roofs used a different source for cost information, RS Means®, and also concluded that the cool roof standard was cost-effective. This data is substantial and supports the adopted aged roof reflectance standards as cost-effective.</p> <p>It also should be noted that the aged solar reflectance does not result in the removal of roofing products from the market. This is because the performance compliance method, the Overall Envelope TDV Approach in the Nonresidential Alternative Calculation Method, and the ability to make tradeoffs with insulation allow for non cool roof rated products to continue to be installed.</p> <p>(C) The Commission has responded to this comment in response to Mr. Callahan's comments on pages 42-50 in the transcript, and incorporates that response here.</p> <p>(D) Removing the cool roof standard would result in a backward step in energy savings, which is contrary to the Commission's statutory obligations.</p>
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<p>Section 140.3(a)1Ai &amp; 141.0(B)Bi</p>	<p>(A) The 2013 standards rulemaking process feels anti-collaborative - the CEC should have more discussions with industry to develop the standard rather than proposing a standard and getting feedback, then proposing a different standard and getting feedback.</p> <p>(B) We agree with the Phil Dregger Report (mentioned by Ms. Hardy Pierce on pages 167-172 of the March 12, 2012 transcript) that it is important to consider dew point and moisture problems when looking at below-deck insulation.</p>	<p>N/A, Yes</p>	<p>(A) Contrary to the commenter's assertion, the Commission has had discussions with industry representatives at public workshops before the formal rulemaking process (e.g., on Nov. 16, 2010, June 9, 2011, June 10, 2011, July 15, 2011, Aug. 17, 2011, Aug. 23, 2011, and Oct. 13-14, 2011), and by phone (e.g., on Sept. 12, 2011), on the proposed standards. The Commission released a Notice of Proposed Action on February 7, 2012, to begin the formal rulemaking process, and provided the requisite 45-day comment period on the proposed standards along with two hearings (on Mar. 12, 2012 and Mar. 13, 2012). After considering the comments received, the Commission made changes to the proposed standards and released the standards for an additional 15-day comment period beginning May 15, 2012. This is above and beyond what is required under either the Administrative Procedures Act or the Warren-Alquist Act. Nonetheless, the Commission will continue to work with industry going forward into the next cycle of building standards, and invites stakeholder participation in the development of the Alternative Calculation Method manuals for this cycle. However, it should be noted that collaboration does not necessarily result in consensus, and the Commission is not required to adopt consensus standards.</p> <p>(B) The Commission has responded to Ms. Hardy Pierce's comment related to the Phil Dregger report above, and incorporates that response here.</p>
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<p>Section 140.3(a)1Ai &amp; 141.0(B)Bi</p>	<p>Ms. Hardy Pierce:</p> <p>(A) Reiterates concern about moisture problems from the cool roofs requirement, suggesting that contractors may not be sophisticated enough to know that they need to make tradeoffs to protect against moisture problems.</p> <p>(B) Would like time to consider the values used in the insulation versus cool roofs tradeoff table, because currently it looks like there's a penalty for using insulation instead of cool roofs.</p>		<p>(A) As explained in its response to Ms. Hardy Pierce's comment on pages 167-172 of the March 12, 2012 transcript, the Commission added mandatory insulation requirements for new and altered roofs (Proposed 2013 Building Efficiency Standards, Pub. No. CEC-400-2012-004-15 DAY (May 2012) at pp. 155, 263), which, in addition to allowing tradeoffs between aged solar reflectance and insulation, will help thermal dynamic assemblies perform properly under different ambient conditions, without developing moisture-related problems, and will also ensure that unsophisticated contractors do not inadvertently install roofs that may have these problems.</p> <p>(B) The Commission provided the insulation versus cool roof tradeoffs table in 15-day language, giving stakeholders 15 days to comment on the new values as required under the Administrative Procedure Act (Gov. Code section 11346.8, subd. (c).) Also, the Commission made the Errata to the table available prior to the adoption of the Standards and had a conference call on May 24, 2012 with Mr. Bill Callahan of the Associated Roofing Contractors of the Bay Area Counties to discuss the changes before recommending them for adoption. (See Comment from Bill Callahan, Docket No. 65467, Comment No. 112a (May 25, 2012).</p>
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<p>Section 140.3(a)1Ai &amp; 141.0(B)Bi</p>	<p>(A) Commenter explains how the tradeoff insulation values were derived, and agrees that there is a penalty for using insulation instead of cool roofs when using the DOE cool roofs calculator.</p> <p>(B) Explains where the cost data came from for the roof coating cost effective study.</p> <p>(C) Because there are performance standards, no product is actually eliminated by the standards, much less 30% of products, because contractors can use performance standards instead of prescriptive standards.</p>	<p>N/A</p>	<p>This comment supports the regulations and does not request changes to the regulations. Regarding (A), the Commission notes that the DOE cool roof calculator shows some differences from the Commission's standards, as explained in more detail in response to comment 89 (Docket No. 65079). Regarding (C), the Commission agrees that non-cool roof products will not be eliminated by the proposed standards because contractors may still meet the performance standards and may make tradeoffs between insulation and aged solar reflectance that results in using non-cool roof materials.</p>
<p>140.3(b) &amp; 141.0(B)Bi</p>	<p>When will the final tradeoff calculations and approaches be made public?</p>	<p>N/A</p>	<p>As explained at the workshop, the trade-off tables for insulation versus cool roofs would be published in 15-day language, giving stakeholders 15 days to comment on the new values (as required under the Administrative Procedure Act, Gov. Code section 11346.8, subd. (c)). The performance standards using an overall TDV approach is not part of the rulemaking but would be published for proposed adoption as part of the ACMs, which are required to be adopted before the standards can go into effect (Pub. Resources Code section 25402.1).</p>

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<p>Section 140.3(a)1Ai &amp; 141.0(B)Bi</p>	<p>GAF objects to the standards because the AEC Report on cost-effectiveness for low-slope nonresidential roofing materials is flawed: (1) the AEC Report states that APP modified bitumen products are not often used in California, but 100 million square feet of that product was installed in 2011; (2) the Report does not account for the cost to maintain radiative properties (routine cleaning costs), or does so incorrectly, and (3) the costs are not representative of maintenance outside of routine cleaning, such as re-roofing costs and coating costs.</p>	<p>No.</p>	<p>The proposed standards for aged solar reflectance are cost-effective, based on substantial evidence in the record, and therefore no change is necessary. To specifically respond to each objection:</p> <p>(1) Contrary to the commenter's assertion, the AEC Report does not state that modified bitumen APP products are not often used; rather, data for modified bitumen APP was not obtainable because not all contractors install the APP system (as applying APP requires contractors to carry special liability insurance). (AEC, <i>Nonresidential Cool Roof Cost Summary</i> (Feb. 8, 2012), Docket No. 65228, p. 3, fn. 1.)</p> <p>(2) and (3): The Commission used the numbers developed by the Cool Roof Rating Council (CRRC) on cool roof maintenance as the costs for the standards. No stakeholders presented evidence of different costs from these standards, and there is no evidence in the record to contradict these costs. Therefore, the CRRC numbers serve as substantial evidence in the record to demonstrate the costs associated with the standards.</p>
<p>Section 140.3(a)1Ai &amp; 141.0(B)Bi</p>	<p>We support the new standards as they apply to roofing contractors.</p>		<p>This comment supports the regulations and does not request changes to the regulations.</p>

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<p>Section 140.3(a)1Ai &amp;</p>	<p>The California Energy Commission should defer adoption of the new Cool Roof Reflectance Values proposed for the 2013 Building Energy Efficiency Standards because: (1) the Proposed Standards do not have adequate support in the record where the cost and benefits study had very small response rates; (2) the process denied the industry and ARMA, in particular, the opportunity to work with staff to obtain meaningful information on the new Regulations; (3) the foundation for the proposed regulations is flawed and further studies of the costs and benefits of the Proposed Regulation should be</p>	<p>No</p>	<p>The Commission did not defer its adoption of the Cool Roof Reflectance Values because they are cost-effective, technologically feasible, and will result in significant energy savings, and these findings are supported by substantial evidence in light of the whole record. To specifically respond to the comments:</p> <p>(1) The Commission has responded to comments about the adequacy of the AEC cost-effectiveness analysis for nonresidential cool roofs in response to Comment 6a (Docket No. 64149) and Comment 89 (Docket No. 65079), Part (B), and incorporates those responses here.</p> <p>(2) The Commission has kept all industry members informed, especially the commenter, ARMA. The Commission has had discussions with industry representatives at public workshops before the formal rulemaking process (e.g., on Nov. 16, 2010, June 9, 2011, June 10, 2011, July 15, 2011, Aug. 17, 2011, Aug. 23, 2011, and Oct. 13-14, 2011), and by phone (e.g., on Sept. 12, 2011), on the proposed standards. The Commission released a Notice of Proposed Action on February 7, 2012, to begin the formal rulemaking process, and provided the requisite 45-day comment period on the proposed standards along with two hearings at which representatives of industry were in attendance (on Mar. 12, 2012 and Mar. 13, 2012). After considering the comments received, the Commission made changes to the proposed standards and released the standards for an additional 15-day comment period beginning May 15, 2012. Despite ARMA's statements that it wishes to help and contribute, it has not provided any cost data to the Commission, and nothing to show that the standards are not cost-effective.</p> <p>(3) The Commission understands this comment to refer to (a) the 2002</p>
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141.0(B)Bi	<p>undertaken; and (4) the present proposals would send a very bad signal to business and to other interested parties in California. The Commission is required to consider the impact on housing costs, total statewide costs and benefits of the Standard over its lifetime, economic impact on California businesses, and alternative approaches and their associated costs under Public Resources Code section 25402. Thus, the standards are arbitrary, capricious, and without proper foundation.</p>		<p>Lawrence Berkeley National Laboratory Study that supported the 2005 adoption of a cool roofs standard, and (b) to the AEC Report which supports the cost-effectiveness of the cool roofs standard. The Commission has responded to (a) in response to Comment 6a (Docket No. 64149), and to (b) in response to Comment 89 (Docket No. 65079), Part (B) and incorporates those responses here.</p> <p>(4) The Commission has engaged stakeholders and the public in discussions on the proposed cool roofs standards, as described in (2) above. In addition, the Commission has made findings on impacts of the Standards on housing costs, total statewide costs and benefits of the Standard over its lifetime, the economic impact on California businesses, and alternative approaches and their associated costs and has included those findings in the Notice of Proposed Action, the Initial Statement of Reasons, and the Final Statement of Reasons. These findings are based on substantial (and uncontradicted) evidence in the record, including the AEC's Non-Residential Cool Roof Cost Summary (Feb. 8, 2012), and the CASE Report. <i>Nonresidential Cool Roofs</i> (Oct. 2011).</p> <p>In sum, because substantial evidence in the record demonstrates that the cool roof standards are cost-effective, technologically feasible, and will result in significant energy savings to the state, and because failing to adopt the standards will result in lost energy savings, the Commission adopted the Standards.</p>
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Section 140.3(a)1Ai & 141.0(B)Bi	The AEC Report is seriously deficient and cannot be relied upon for the cost increase estimates that underlie the proposed standards because: (1) four different sources were used to gather the information (e-mail, phone, unspecified, and single manufacturer), which sometimes resulted in only a single data point to support the cost estimate; (2) there is no information on the survey (lack of transparency); (3) the individual responses look higher than the summarized costs used; (4) the incremental responses are identical for three categories, which is next to impossible if survey was truly random; and (5) the survey is statistically invalid.	No.	Mr. Wilde's oral comments reiterate points the points he made in the Gnarus Advisers analysis that was submitted as an appendix to the Asphalt Roofing Manufacturers Association's Comment Number 89, Docket No. 65079 (May 4, 2012). The Commission has provided specific responses to each point in response to Comment docketed at 65079, and incorporates those responses here.
Section 140.3(a)1Ai & 141.0(B)Bi	Explains how AEC obtained the cost information and what assumptions were made in the cost-effectiveness report on the aged solar reflectance standard for low slope nonresidential roofs.	N/A	This comment supports the regulations and does not request changes to the regulations.
JA7.5.6.2	Mr Raymer requests the ability to make field changes to registered compliance documents.	No	The Commission did not make the requested change as it is contrary to the fundamental purpose of document registration, which is to retain finalized compliance documents in a manner that ensures that the documents have not been tampered with after the responsible person signed them to finalize them in the data registry and thereby places them in the custody of the Energy Commission as an official document. (See Evid. Code sections 1530-1532.) However, a person may still "change" a registered document by registering a revised version of the document that was previously registered as described in Reference Residential Appendix JA7.5.6.2.
110.1	Mr. Shoemaker expresses concern that for nonresidential buildings, the required solar zone of 40% of roof area is not compatible with skylights and other roof mounted equipment.	Yes	For nonresidential buildings the solar zone requirement was altered to be 15% of the roof area.

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3/12 transcript NR8	Mr Devito Disagrees with Equation 140.3-B	NO	Staff and Stakeholders agree with Equation 140.3-B and kept equation in the 45 Day Language.
3/12 transcript NR8	Mr. Nittler Disagrees with using the best values for dynamic glazing.	NO	Staff and Stakeholders disagree with MR Nittler's comment simply because the 2012 IECC also references the same language. However, the Energy Commission added Automatic Controls requirements. Additional to the 2012 IECC
3/12 transcript NR8	Mr. Gabel provided editorial changes to the Definition Section of the Energy Standards	YES	Editorial changes were made in response to these comments.
3/12 transcript NR8	Mr. Bacchus Supports Equation 140.3-B and to keep in.	yes	Energy Commission agrees; no changes were made.
3/12 transcript NR8	Mr. Shirak Agrees with the procedure on how we arrived to Equation 140.3-B	yes	Energy Commission agrees; no changes were made.
3/12 transcript NR8	Mr. DeVito Disagrees with Table EQ 141-A	no	Energy Commission disagrees; no changes were made.
3/12 transcript NR8	Mr. Gabel is concerned about who is the designated third party in Table 141.0(c)?	NO	There is no definition of the "third Party" but the standards refer indirectly to who might be a third party as; design engineer, field inspector, etc.

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Section 120.6	Mr. Richter commented that the way the refrigerated heat recovery section is written in section 120.6, it seems like it's limited to space heating. It could be expanded to other heat reclaim applications such as automobile water heating.	No.	The Commission did not change section 120.6 . It is not clear whether the commenter wanted to use water heating instead of space heating or in addition to space heating. Section 120.6 already allows heat recovery to go toward water heating applications in addition to space heating, so no change is necessary for that. However, section 120.6 does not allow heat recovery to be used in water heating applications instead of space heating because such a requirement would not be cost-effective.
140.6 Table 140.6-C.	Mr. Thomas recommends clarifying how the Standards address the concept of tenant leased spaces related to lighting alterations and repairs, particularly related to how Section 140.6 treats tenant leased spaces.	Yes	For clarity, the function area previously identified as Tenant Leased Space was removed from the definitions in Section 100.1, as well as from Section 140.6. Also, for clarity, new language was inserted into Section 140.6(c)2E to address what previously had been identified as Tenant Leased Spaces.
3/12 transcript 141.0(b)2i.	Mr. Thomas suggests clarifying when installing lighting controls does not require compliance with the Standards.	Yes	Language in Section 140.0(b)2i was modified for clarity as recommended.
3/12 transcript 140.0)b)2.	Mr. Thomas recommends clarifying what is the definition of a luminaire for complying with the Luminaire Modifications in Place requirements.	Yes	New language was inserted into Section 141.0(b)2i to clarify how to classify a luminaire for compliance with this section.

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3/12 transcript 141.0(b)21.	Mudit Saxena did not see where daylighting controls, as supported in the Daylighting CASE report he worked on, were required for lighting alterations.	Yes/No	The recommended daylighting control requirements for alterations were already located in Tables 141.0-E and 141.0-F.
3/12 transcript Tables 141.0-E and 141.0-F.	Mr. Thomas requests changing the term "space type" to "function area" for clarity.	Yes	The recommended change was made.
3/12 transcript NR8	Mr. Gabel recommends not deleting the default wattages for low voltage lighting systems.	Yes	Re-inserted the default wattages for low voltage lighting that were struck-out in 45-Day Language
3/12 transcript NR8	Mr. Klein recommended that distribution design lengths for water heating be specified for nonresidential buildings	No	The commenter did not provide, and the record does not contain, any documentation that would support the cost-effectiveness of restricting plumbing lengths in nonresidential buildings (this is not surprising, considering the very low demand for hot water in residential buildings.)