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January 22, 2016

Submitted via email: docket@energy.ca.gov

Mr. Andrew McAllister
Commissioner
California Energy Commission
1516 Ninth Street
Sacramento, California 95814

Docket No.15-AAER-6

**NEMA Comments on Proposed Amendments to Appliance Efficiency Regulations;
Revised 15-Day Language**

Dear Commissioner McAllister,

The National Electrical Manufacturers Association (NEMA) is taking this opportunity to provide the attached comments on the California Energy Commission's Proposed 15-Day Language Amendments to Appliance Efficiency Regulations with respect to certain General Service LED Lamps, including omnidirectional LED Lamps, directional LED lamps and Small Diameter Lamps. These comments are submitted on behalf of NEMA Lighting Division member companies.

As you may know, NEMA is the trade association of choice for the electrical manufacturing industry. Founded in 1926 and headquartered near Washington, D.C., NEMA represents nearly 400 electrical and medical imaging manufacturers. Our combined industries account for more than 400,000 American jobs and more than 7,000 facilities across the U.S. Domestic production exceeds \$117 billion per year.

Please find our detailed comments below. We look forward to working with you further on this important project. If you have any questions on these comments, please contact Alex Boesenberg of NEMA at 703-841-3268 or alex.boesenberg@nema.org.

Sincerely,



Kyle Pitsor
Vice President, Government Relations

NEMA Comments on Proposed Amendments to Appliance Efficiency Regulations; Revised 15-Day Language

General Comments

1. NEMA notes the CEC addressed and resolved many of our previously stated concerns regarding the 45-Day proposed language for Multi-Faceted Reflector (MR) and Small Diameter Directional Lamps (SDDL)¹. A few small concerns remain for this category which we describe below in our detailed comments.
2. It is our hope that the Commission will exert the same amount of interest and collaboration shown in addressing our MR/SDDL comments towards our continued concerns for the State-Regulated Light Emitting Diode (LED) General Service Lamp (GSL) language. This has not been done satisfactorily to date, but it is not too late to adjust the proposed regulatory language to ensure high-efficiency products in wide availability and performance are present in the market to suit the varied consumer preferences in this market.
3. We appreciate that the CEC responded to a few of our requests for additional information in the Supplemental Staff Analysis document published on December 28, 2015². However, this document and the Supplemental Initial Statement of Reasons published on the same day³ fail to address many of the questions raised --- factual and legal --- and requests for additional information made in our comments to 45-day language. We again ask the CEC to respond in writing to these concerns, before the adoption hearing and not in the Final Statement of Reasons document, which might lag weeks or months after adoption.
4. The revised 15-day language continues to promote unrealistically high color rendering index (CRI) requirements for R8, which effectively forces manufacturers to supply nominal CRI 90 products to the market instead of the CRI 82 specification elsewhere in the 15-day language. In other words, the CRI 82 specification is illusory. The result will be that the CEC is going to compel consumers to buy *more expensive and less efficient* CRI 90 LED lamps. Compared to consumers in the rest of the country, Californians will have to spend more and get less in terms of energy efficiency. This proposal fails to meet both the necessity and consistency requirements of California Government Code §11349.1(a). By our calculation, the CEC is potentially sacrificing up to 20% of energy savings by taking this ill-advised, over-specified approach to CRI that consumers will not actually benefit from. Using the energy savings estimates from the October 2015 CEC Staff Analysis⁴, CEC is foregoing up to 172 gigawatt-hours (GWh) annually if it approves the revised 15-day language as written. Through 2029 this represents up to 1253

¹ http://docketpublic.energy.ca.gov/PublicDocuments/15-AAER-06/TN206828_20151204T051310_Alex_Boesenberg_Comments_NEMA_Comments_to_Title_20_45day_Langua.pdf

² http://docketpublic.energy.ca.gov/PublicDocuments/15-AAER-06/TN207130_20151228T085859_Supplemental_Staff_Analysis_for_General_Service_LightEmitting_D.pdf

³ http://docketpublic.energy.ca.gov/PublicDocuments/15-AAER-06/TN207131_20151228T085859_Supplimental_ISORAttachment_A.pdf

⁴ http://docketpublic.energy.ca.gov/PublicDocuments/15-AAER-06/TN206387_20151016T152059_2015_Staff_Report_Analysis_of_SDDL_and_General_Service_LED_Lamp.pdf See page iii.

gigawatt-hours of lost energy savings. This is a serious result which would seemingly be at odds with public policy objectives in California to improve energy efficiency and reduce carbon dioxide emissions. For more information on energy efficiency concerns, see Part A, Comments 6 and 7, *infra*.

5. Cost Analysis: We note the efforts to revise the cost analysis, as shown in the Supplemental Staff Analysis (footnote 2). We offer the following additional information regarding the feasibility of red phosphor and call in to question the CEC's determination that this is a feasible technical alternative at the costs claimed. While NEMA and CEC staff agree that there is a cost increase associated with the change of the red phosphor (to, for instance, the phosphor used for CRI 90 lamps), we note that the CEC has not considered the additional cost associated with the need to increase efficacy: the addition of the phosphor typically reduces the efficacy approximately 15%. The effect of this reduction in efficacy is to cause the lamp to not meet the 68 lm/W requirement. The CEC's analysis does not examine the financial or technical impacts of such considerations.
6. Federal Preemption: There also remains the issue of federal preemption that should be considered in this rulemaking, which may render nearly all (if not all) of the energy standards adopted in this proceeding superseded by federal law. This factor strongly suggests that CEC should cease this proceeding in light of the pending Department of Energy's federal rulemaking on general service LED lamps.

The CEC appears to be undertaking its proposed course of action with the prospect of federal preemption, as provided in Section 327 of the Energy Policy and Conservation Act (EPCA), 42 U.S.C. §6297, in full view. As the CEC Staff Report⁵ in this proceeding acknowledged, the United States Department of Energy (DOE) has initiated an energy conservation rulemaking for general service lamps that is expected to be completed before January 1, 2017. A Notice of Proposed Rulemaking (NOPR) in the DOE's general service lamp rulemaking is currently understood to be under review at the U.S. Office of Management and Budget, and publication of the NOPR in the Federal Register is expected shortly. While the DOE's proposed position on the scope of a general service light emitting diode lamp in the NOPR is not officially known, a Preliminary Technical Support Document released by DOE in December 2014⁶ signaled DOE's pre-NOPR view on the definition of a general service light emitting diode:

"DOE appreciates NEMA's proposals for definitions to support the LED lamps covered in this rulemaking. As stated previously, DOE has tentatively determined that the term general service LED lamp includes both integrated and non-integrated LED lamps. Therefore, DOE has decided to propose a more general definition similar to the definition proposed for "compact fluorescent lamp" discussed in section 2.3.2 to clearly explain this determination. DOE is proposing the following definition for general service LED lamp:

⁵ Analysis of Small-Diameter Directional Lamp and General Service Light-Emitting Diode (LED) Lamp Efficiency Opportunities at 47 (Docket Number 15-AAER-6)(October 2015).

⁶ Department of Energy, PRELIMINARY TECHNICAL SUPPORT DOCUMENT: ENERGY EFFICIENCY PROGRAM FOR CONSUMER PRODUCTS AND COMMERCIAL AND INDUSTRIAL EQUIPMENT: GENERAL SERVICE LAMPS at 2-19 (December 1, 2014).

General service light-emitting diode (LED) lamp means an integrated or non-integrated LED lamp designed for use in general lighting applications (as defined in 430.2).

As stated in the definition, general service LED lamps are used in general lighting applications. In the framework document, DOE considered including in this rulemaking all LEDs that serve general lighting applications and are not the lamp types or shapes excluded from the GSIL definition in 42 USC §6291(30)(D)(ii). As discussed in section 2.3.2, DOE reassessed its interpretation of the exemptions from the GSIL definition, referred to in the GSL definition, and determined that because the definition of GSL in 42 USC §6291(30)(BB)(i) explicitly states that the term includes general service LEDs, the intent of the definition was to consider all general service LEDs to be GSLs. DOE determined that the exemptions for certain bulb shapes and lighting applications in the GSIL definition do not generally apply to the other lamp types included in the definition of GSL. Otherwise all LED lamps would be considered exempt, rendering the inclusion of LED lamps in the GSL definition a nullity. In this preliminary analysis, DOE assessed whether LED lamps exist that are designed for specialty applications and therefore cannot provide overall illumination. DOE identified LED lamps that were designed for specialty applications and are not able to provide overall illumination, including black light lamps, bug lamps, colored lamps, plant light lamps, and silver bowl lamps. DOE is considering providing exemptions for these specialty applications, which are discussed further in section 2.3.5. DOE requests comment on the LED lamps identified for specialty applications that cannot provide overall illumination and if there are other LED lamps that should be considered. DOE also requests comment on its proposed definition for general service LED lamp.”

What will emerge from DOE’s rulemaking and DOE’s definition of “general service light-emitting diode (LED) lamp” is the scope of what DOE considers to be the LED “covered product” included in Congress’ definition of general service lamp in the Energy Independence and Security Act of 2007 amendments to the Energy Policy and Conservation Act. 42 U.S.C. §6291(BB). The DOE’s proposed definition cited above includes both omnidirectional as well as directional and reflector LED lamps⁷ as well as integrated and non-integrated LED lamps. If the DOE continues with this definition through its Final Rule expected later in 2016, which is what NEMA currently anticipates, it is clear that nearly all (if not all) of the LED products that the CEC proposes to regulate in this rulemaking will be covered products under federal law, and under Section 327 of EPCA the CEC’s energy conservation standards for these covered products will be preempted.

⁷ Thus, while Congress explicitly excluded *incandescent* reflector lamps from the definition of general service lamp, 42 U.S.C. §6291(BB)(ii)(II), it did not exclude LED reflector lamps. Notably, PAR, R, ER, and BR bulb shapes are not listed among the “bulb shapes” excluded by the preceding paragraph, 42 U.S.C. §6291(BB)(ii)(I). Multifaceted reflector (MR) LED lamps and multifaceted reflector extended (MRX) LED lamps are not excluded from the definition of general service lamp either.

Section 327(b) of EPCA, 42 U.S.C. §6297(b), preempts state laws and regulations with respect to covered products before a federal energy conservation standard becomes effective for that covered product.⁸ There are exceptions to this express preemption spelled out in the statute, and only one is applicable in the case of the CEC's proposed action in this proceeding. 42 U.S.C. §6297(b)(1)(B)(ii).⁹ Federal preemption is effective for the entire scope of the covered product, whether or not the DOE establishes an energy conservation standard for every class or type of product within the scope of the covered product. If, as expected, the DOE promulgates energy conservation standards for general service LED lamps prior to January 1, 2017 with the definitional scope that the DOE has proposed, the CEC's regulation will be preempted at that time. In view of the manner in which the DOE rulemaking appears to be unfolding, the proposed CEC regulations in this proceeding might be expected to have a shelf-life of less than one year from now.

"The exclusive exception to preemption that Congress provides to California in the event that a federal standard was adopted for general service lamps is to permit those two states to accelerate the adoption of the federal rule to "no earlier than 12 months prior to the Federal effective dates prescribed under subparagraphs (A), (B), and (C) of section 325(i)(1), *at which time any prior regulations adopted by the State of California . . . shall no longer be effective.*" *Id* (emphasis supplied).

The CEC staff's treatment of federal preemption in the Staff Report, while explicitly acknowledging federal preemption, is vague on the scope of what might be preempted, and NEMA has interpreted this vagueness to the fact that the DOE's general service lamp rulemaking was in its "preliminary analysis stage." The CEC staff report states:

"In addition, the DOE is in the preliminary analysis stage of a "general service lamp" performance standard that would, as currently proposed, cover medium screw base LED omnidirectional lamps. The performance standards that would be finalized through this process would also eventually replace state-specific standards where the scopes overlap. The standards, however, are not likely to take effect until 2020, leaving a significant amount of energy and cost savings opportunity unrealized in the meantime."

While it is true, as the CEC staff notes, that the DOE appears to be focused on regulating medium screw base LED omnidirectional lamps at this time, the DOE has

⁸ "(b) General rule of preemption for energy conservation standards before federal standard becomes effective for a product. Effective on the date of enactment of the National Appliance Energy Conservation Act of 1987 [enacted March 17, 1987] and ending on the effective date of an energy conservation standard established under section 325 [42 USCS § 6295] for any covered product, no State regulation, or revision thereof, concerning the energy efficiency, energy use, or water use of the covered product shall be effective with respect to such covered product, unless the State regulation or revision ---" ...

⁹ (B) * * *

(ii) the States of California and Nevada may, at any time, modify or adopt a State standard for general service lamps to conform with Federal standards with effective dates no earlier than 12 months prior to the Federal effective dates prescribed under subparagraphs (A), (B), and (C) of section 325(i)(1) [42 USCS § 6295(i)(1)], at which time any prior regulations adopted by the State of California or Nevada shall no longer be effective.

clearly indicated that that is not the scope of the general service LED lamps that they intend to “cover” as a federally-covered general service LED lamp product. Federal preemption applies to the covered product as a whole, not specific classes within that covered product for which the Secretary of Energy may choose to enact an energy conservation standard.

7. Finally, we have noted that this docket contains a number of recently submitted comments from citizens who apparently believe that NEMA’s comments in its 45-day language comments are aimed at reducing energy savings in California. While it is not clear who is motivating these comments and why, and they may have been submitted to the docket in good faith notwithstanding their erroneous assumptions and statements, we trust the Commissioners will see from our comments and analysis that these comments are entitled to no weight in this proceeding because NEMA’s recommended changes to the regulatory proposal will encourage continued and *increasing* rates of adoption of *more* efficient products.
8. This rulemaking began almost 3 years ago, and based its approach on the fundamental assumption that there is, or was, a reluctance to adopt LED lamps by consumers. At that time, general service LED lamps were just introduced the market, and --- not surprisingly and consistent with the price behavior of many other newly-introduced products --- prices for these new products were initially high and much more expensive than other general service lamp technologies --- fluorescent and halogen incandescent. The higher prices of LED lamps that were initially placed on the market naturally presented a problem for widespread consumer adoption. However, a market-driven revolution spurred by manufacturer innovation tied closely to consumer needs and interests has changed all that. In three short years, the price of general service LED lamps is nearly on par with the product they are primarily intended to replace in sockets, the halogen incandescent, and they are continuing to fall. Numerous studies done by the CEC and the Investor Owned Utilities confirmed that the largest impediment to adoption of these products was price. The Staff Analysis mentions this fact, but fails to reach conclusions consistent with market realities. As to the price of LED lamps, the staff analysis indicates their proposal will INCREASE price. Worse still, the proposed LED designs in the proposal are less energy-efficient than today’s more popular LED options. The 15-day language would represent a major setback for the innovative consumer-based revolution that has occurred; a step-backward for California.
9. A fundamentally flawed premise --- a hypothetical if you will --- that underlies the 15-day language is that the new and innovative LED products now on the market do not satisfy the consumer, and that government needs to tell manufacturers how to make more expensive, less energy-efficient LED products in order to overcome this hypothetical concern. While we understand that the basis of this concern is that some CEC staff members want to be absolutely certain that the experience the consumer had with the compact fluorescent lamp (CFL) in the 1990s is not repeated, that experience is entirely irrelevant to the vast majority of general service LED lamps on the market today. It

ignores the fact that lighting manufacturers already had this concern in their view as they planned and implemented their innovations aimed at satisfying consumer preferences while substantially lowering the cost and price of LED lamps now on the market. At no time have any credible studies been performed to ascertain any adoption challenges or consumer preference influences except price. Sadly, at the same time CEC staff has dismissed multiple studies from the Lighting Research Center in Troy, NY which contradict staff's assumptions about consumer color preferences.

Detailed comments continue on the following page.

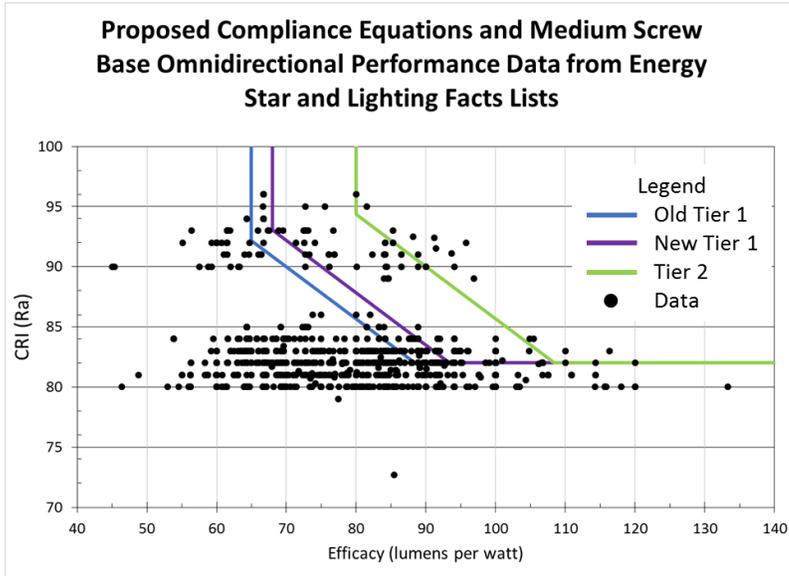
Part A: Detailed Comments Specific to the LED Lamps Proposal

1. Directional Lamps: We appreciate that the Commission drafted a definition for Directional Lamps in response to our comments suggesting that need. However, the reason to define said lamps was and is to couple that definition with a 10% relaxation in efficacy requirements (compared to A-line LED GSLs), owing to these products' well established lower efficacy (see page 11 of 32 in the NEMA comments linked in footnote 1). We ask the commission to recognize a 10% allowance for these lamps in the efficacy/CRI equation.
2. We appreciate that the commission accepted our comment to reference ANSI C78.377 Annex B regarding chromaticity. We note that the correct reference is "Table B1." Citing the correct reference will help reduce confusion and burden.
3. We continue to disagree with the CEC's approach of over-specifying R8 CRI and simultaneously implying that lamps with CRI = 82 are feasible in terms of meeting the unrealistically high requirements for $R8 \geq 72$. A reasonable person easily recognizes that by over-specifying the CRI of R8 in the manner the CEC proposes results, as a practical matter, in a lamp with an overall CRI of 90. There are no CRI 82 LED lamps with $R8 = 72$. For lamps with an overall CRI 82, R8 is considerably lower. Furthermore, CRI 82 and $R8 \geq 72$ is not common at all, and likely impossible to achieve this with currently existing phosphors which are **optimized for lamp efficacy**.
4. The Commission's proposal continues to misunderstand the complex interplay in lamp design and performance between CRI aggregate, individual CRI color rendering indices (R1 – R8), Correlated Color Temperature, and other factors as outlined in detail in our comments to 45-day language. As we noted in our 45-day language comments, high CCT lamps have higher R8, but lower CCT lamps are more often chosen for their "warm" appearance. The data submissions from other entities supporting the R1-R8 requirements have not accounted for CCT in their submissions, and the CEC's Supplemental Staff Analysis also ignores this important factor. Again, a person might look at the graphs in the Supplemental Staff analysis and mistakenly infer that there is a wide variety of products available that meet the revised 15-day proposal. There is not.

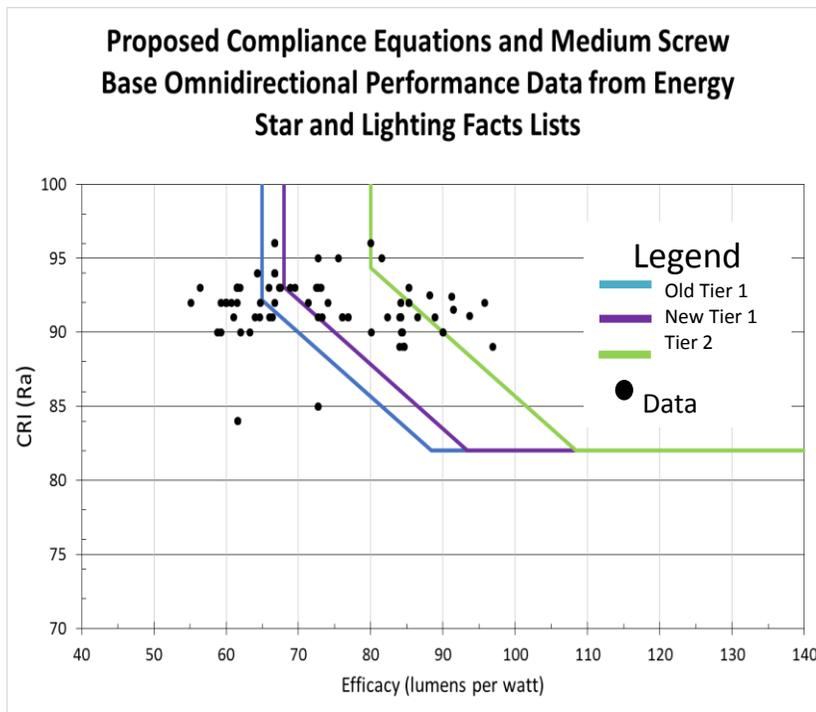
We note that the CEC has not answered our request for a list of compliant products detailing compliance with all the many parameters proposed to be required by the revised 15-day language. The public databases from ENERGY STAR and DOE LED Lighting Facts lack several of the proposed mandatory parameters, and thus graphs and arguments developed from them are incomplete, but imply again that the regulation is feasible. We contend that the CEC is obliged to clearly list in detail compliant products and their performance parameters to ensure that their own analysis and interpolation about current and future performance is adequately tested.

An example of recent misleading statements can be found in the CEC Supplemental Staff Analysis (footnote 2) page 5 of 6 where CEC staff assert "that a significant number of lamp models already meet the CRI-efficacy tradeoff equation proposed in 15-day language for Tier 1: . . . ". However, staff did not complete the analysis for the other 7 proposed requirements, nor did they take into account the CCT of the lamps (to make sure that there are some less than 5000 K). This statement and related omissions

display a serious lack of due diligence and a significant misunderstanding of lighting engineering.



CCT ≤ 3000K
R9 not specified



CCT ≤ 3000K
And R9 > 32

The foregoing graphs copied from the IOU comments to 45-day language¹⁰ seek to illustrate their claim that lamps with an R8 of 72 have a CRI close to 90. They are based on data for omnidirectional lamps taken from the ENERGY STAR and DOE LED Lighting Facts lists. Both show CCT's less than or equal to 3000K. The second figure shows that when using R9 > 32 as a proxy, as the IOUs did, only lamps with a CRI ~ 89 or greater will meet the Tier 1, either new or old.

5. CRI vs. CCT, Efficacy:

a) In follow up to our example in item 4 above, as we noted in our 45-day docket comments (footnote 1), efforts to justify the use of R9 as proxy for R8 is a significant technical error and inaccurate. As we demonstrated in our 45-day comments, R8 and R9 are related, but not directly proportional and perhaps more importantly they vary by color temperature (CCT). Setting overly burdensome R1-R8 score requirements will incentivize high-CCT lamps ($\geq 5000K$), which consumers will not prefer. The data submitted by Mr. McGaraghan (and repeated in the supplemental staff analysis issued on 12/28) does not include any distinction between high and low CCT for the lamps graphed, and again misleads the public into believing there is widespread product compliance across the typical range of choices demanded by consumers. There is not.

We again provide the following graph of R8 and R9 versus CCT as an illustration of the above described interrelationship (R values gathered from NEMA members):

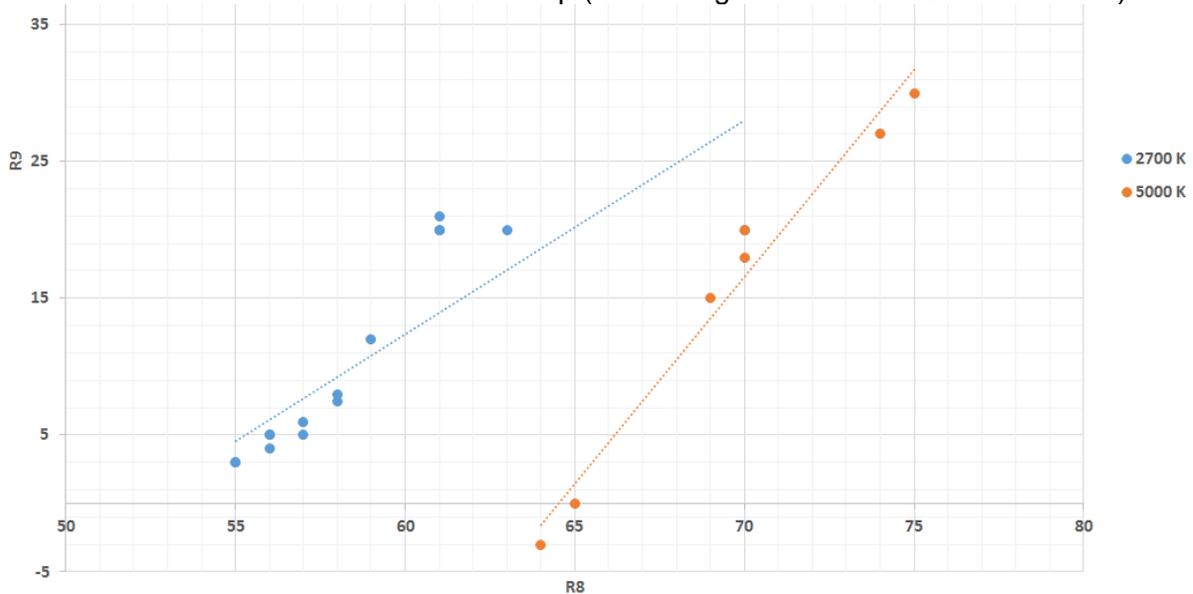


Figure 1: Comparison of R8 and R9 for 2700K products and 5000K Products

b. CRI versus efficacy: We note that a reverse analysis of the CEC's proposed lm/W vs. CRI qualification equation shows a 20% difference in achievable efficiency

¹⁰ http://docketpublic.energy.ca.gov/PublicDocuments/15-AAER-06/TN206868_20151207T161702_Michael_McGaraghan_Comments_CA_IOU_Comments_on_LED_Lamps.pdf
Multiple pages and graphs.

between 80 and 90 CRI products: 90 CRI products may be up to 20% less efficient than their 80 CRI siblings. NEMA appreciates very much that the CEC allows for a tradeoff, in recognition of the limitations of the laws of physics regarding red LED efficiency, but we are deeply confused as to why CEC would write a CRI and R1-R8 proposal which effectively mandates CRI = 90, ignoring the additional energy savings that CRI 80 products bring. It makes more sense to allow consumers to choose, and take advantage of the increased energy savings and reduced operating costs that < 90 CRI products afford CA and its citizens. It is for this reason that we submit that the proposed rule's requirements on CRI fail to meet the California Government Code's requirements of necessity and consistency, and that a reasonable person could not have reached the conclusion reached by the CEC, and that NEMA's alternative proposal is as effective or more effective and less burdensome in achieving energy savings without sacrificing product acceptance and quality. California Government Code §§11349.1(a), 11346.9. This proposal is contrary to the CEC's statutory mission and will not result in the sale of more LED lamps; it will have the opposite effect.

c. CRI, efficacy versus cost: We disagree with the cost analysis as put forth in the Supplemental Staff Analysis. While we agree that the cost for consumers and manufacturers of 80 CRI LED omnidirectional lamps has decreased over the years, the 90 CRI lamps that currently meet the proposed requirements are niche products that do not benefit from economies of scale. They have higher costs because they have more costly components. Those components and higher costs are not going away. What the CEC has not adequately studied or analyzed --- and it must to correctly understand the impact of its proposed rule --- is how the cost of the product with the additional components will change in light of the CEC's proposed requirements. The CEC's model basically assumes that the cost/price behavior of 80 CRI products is representative of what the market will see for 90 CRI products. This is not a safe assumption, because they are not going to have the same lower cost as the 80 CRI products thus defeating the consumer's strong interest in a lower initial cost that the 80 CRI products have started to achieve. And while some manufacturers previously made lamps that may have met the proposed requirements, they changed their portfolios to 80+ CRI lamps whose lower price has fostered widespread adoption.

As a result the CEC's proposal will cause the market to move backwards, and start over in terms of price trends and design development and innovation. While we appreciate the revised 15-day language proposes to extend the initial implementation date by six months, this is not be enough time to overcome the combined impact of the proposed changes to designs and performance requirements, and it is quite likely that no amount of time will bring costs back down to where the 80 CRI products are now.

d. In conclusion: NEMA again proposes that CEC respect and restore the global minimum of CRI 80 for LED lamps in California, and if the CEC will not abandon the unnecessary R1-R8 requirements we suggest at the very least that the R8 requirement be set at R8 > 55, leaving R1-R7 > 72. This will allow well-made, high quality CRI 80 products already selling in high volume to remain competitive available in the market and to serve as lower-cost alternatives when high color rendering is not needed. This will also help compete against CFLs, which are the

leading high-efficiency cost competitor and will remain so. We recommend the following change to the proposal language:

1605(k)(2)(C)

(ii) A CRI (Ra) of ~~8280~~ or greater

(iii) Individual color scores of R1, R2, R3, R4, R5, R6, and R7, ~~and R8~~ of 72 or greater, and an R8 of 55 or greater

6. Standby Power and Connected Lamps: we remain concerned that the CEC has not addressed our comments regarding standby power and lamp functionality and flexibility from our 45-day comments. We submit that the CEC has not conducted sufficient analysis into the needs and benefits of standby power in connected lamps; rather the “examination” has only been to identify the lowest levels reported without any consideration as to the related functionality. This ignores the tradeoffs present in the myriad connectivity types and their services and will only serve to reduce the use and benefits of connected products in California as compared to other states. Additionally, like Directional lamps, connected lamps have inherently lower efficacy than their non-connected counterparts due to the added services. Additional power consumed in connected lamps is used for microprocessor control and radio frequency components. Tunable and color changing lamps also use some lower efficacy LEDs (e.g. 2200K white LEDs or RGB LEDs), and require extra optics to mix the light from the different LED colors. The net result is efficacy about 10 LPW lower than a non-connected equivalent. Thus we propose that connected lamps should have an efficacy limit 10 LPW lower than that for non-connected product.

Until the capabilities and demands of the functionality of lamps and the associated standby power needs are more well-defined, NEMA recommends the following changes to the standby power clause in the 15-day language:

(D) In addition to the requirements in 1605.3(k)(2)(C), state-regulated LED lamps manufactured on or after January 1, 2019 shall have a standby mode power of ~~0.2 watts~~ 1.0 watt or less.

7. LED Downlight Retrofit kits: In the comments submitted by NEMA on 12/4/2015, we presented potential issues regarding the inclusion of “LED lamps that are designed for retrofit within existing recessed can housings” that contain one of the covered bases. In the 15-day language released on 12/28/2015, we do not find that any of the comments submitted have been considered or addressed. We therefore reiterate significant concerns with regard to the inclusion of this product category under the scope of a “lamp” rulemaking.
- a) An LED downlight retrofit is inherently different from most of the lamps covered by this rulemaking. Many of these products offer various trim styles or low glare lenses based on aesthetic or interior design appeal. These are features that are proven to be a quality attribute for consumers. At the 11/18/2015 hearing, there were numerous comments expressing concern that quality attributes are critical to the California market and the energy code should not drive the “race to the bottom” in quality in order to maximize energy efficiency. However, this rulemaking will do exactly that for downlight retrofit products. California consumers will be limited to downlight solutions that have more glare and limited designer trim selection, neither of which are preferred by consumers. Many commercial downlights are sold with a

screw based adapter to enable a retrofit or hardwired installation. It is inappropriate to include these commercial luminaires within a “lamp” rulemaking.

- b) NEMA indicated that we have not seen any evidence that this class of product was analyzed relative to the feasibility and cost analysis. We specifically requested that a separate analysis for this class of product is required and requested that CEC make the analysis for these products publicly available prior to releasing the 15-day language, and that this data be reported separately, not wrapped up with and concealed by data for dissimilar lamp types. To date, there has not been any data or analysis for this class of products made publicly available despite multiple requests.
- c) NEMA commented that the inclusion of retrofit downlights within the scope of this rulemaking will result in conflicting requirements between Title 20 and Title 24 JA8. The Commission indicated that all the Title 20 requirements were less stringent than the Title 24 JA8, however we submitted Appendix B in our 12/4/2015 comments to illustrate that there are multiple requirements in Title 20 that are more restrictive than the Title 24 JA8 requirements and highlighted that the proposed language does not meet the consistency requirements for the California Government Code §11349.1(a). The 15-day language does not include revisions to resolve the inconsistency in these standards.

Recommendations for LED Downlight retrofit kits:

We reiterate our request to remove retrofit downlights from the scope of the definition of a “state-regulated Light Emitting Diode (LED) lamp”. We request this because; a) the Commission has not provided the data and analysis to illustrate that this class of product was properly evaluated for feasibility and cost effectiveness; b) because this class of product inherently performs differently than the other bare lamps covered by the rulemaking; and c) removing this product class from the scope will resolve the conflicting requirements between Title 20 and Title 24 JA8.

This can be accomplished by one of two methods:

1. Remove LED lamps that are designed for retrofit with existing recessed can housings from the definition as noted:
“State-regulated Light Emitting Diode (LED) lamp” means a lamp capable of producing light with Duv between -0.012 and 0.012, and that has an E12, E17, E26, or GU-24 base, ~~including LED lamps that are designed for retrofit within existing recessed can housings that contain one of the preceding bases.~~ State-regulated LED lamp does not include a lamp with a brightness of more than 2,600 lumens or a lamp that cannot produce light with a correlated color temperature between 2200 K and 7000 K.”
2. Revise the definition to include only LED downlight retrofits that include a permanently attached base. This prevents the unintended consequence of including higher quality commercial downlights that provide a screw based adapter or can be hard wired to the brand circuit.
“State-regulated Light Emitting Diode (LED) lamp” means a lamp capable of producing light with Duv between -0.012 and 0.012, and that has an E12, E17,

E26, or GU-24 base, including LED lamps that are designed for retrofit within existing recessed can housings that contain one of the preceding bases permanently attached to the retrofit lamp. State-regulated LED lamp does not include a lamp with a brightness of more than 2,600 lumens or a lamp that cannot produce light with a correlated color temperature between 2200 K and 7000 K, or downlight retrofit luminaires that utilize a detachable screw base adapter.”

Detailed comments continue on the following page

Part B: Detailed Comments Regarding Multi-faceted Reflector (MR)
and Small Diameter Directional Lamps (SDDL)

1. We again note the effort by CEC staff to address and incorporate many of our comments to this portion of the 15-day language.
2. Database accuracy issue and minimum efficacy rebuttal: The data contained in public databases needs to be scrutinized before reasonable conclusions can be drawn by the CEC. There are submission errors, math errors and missing fields; products are obsoleted, wattage equivalency and CCT matter. The snapshot 'of 80 lm/W qualifying lamps' that Mr. McGaraghan provides in his comments¹¹ illustrates these issues: of the 22 products listed, 6 present efficacy values without any lumens reported, and another 6 have erroneous LPW calculations. Of the 12 lamps that may be at least 80 lm/W, 6 of them have CCT greater than 3000 K and only 3 are either 20W or 35W replacement lamps. Having only 80 lm/W high CCT lamps available will not save energy – it will cause consumer dissatisfaction and increase energy consumption because the lamps will be 50W equivalents, not 20W and 35W equivalents and of a single color temperature.
3. Beam Angle and Center Beam Candlepower (CBCP): Not all manufacturers test for or report these parameters. Although the CEC does not propose to regulate these parameters, we note that the CEC has proposed they be reported per the line item in Table X, row K on page 17/21 of the 45-day express terms. Rather than make reporting Beam Angle and CBCP mandatory, we propose the CEC make it optional by adding a superscript “2” to the rows, as given in Table K for other parameters such as R9, start time and warranty. The testing burden will arise because of CEC’s use of the DOE’s additional guidance (80 FR 39666) in the Supplemental Notice of Proposed Rulemaking for the Energy Conservation Program: Test Procedures for Integrated Light-Emitting Diode Lamps, and as noted on slide 19 of the CEC’s November 18th 2015 hearing presentation. In the DOE’s guidance, Sections 3.2.6, 3.2.7, and 3.2.8 clearly state “Do not use goniophotometers.” However, to ascertain CBCP a goniophotometer is required, and the CEC’s reporting requirements also stipulate that a test lab be certified by the CEC, another added burden with respect to testing costs if a goniophotometer is required. This means that CEC-listed SDDLs must be tested for the regulated parameters and then re-tested using a goniophotometer to obtain measurements for Beam Angle and Center Beam Candle Power. Such goniophotometer measurements take a minimum of 30 minutes per lamp and represent a significant test burden for manufacturers. We note that larger diameter Federally-regulated directional sources do not have beam angle or CBCP reporting requirements. Again, we ask the CEC to strike these two reporting requirements to reduce testing burden.

Proposed change to Table K regulatory language:

Beam Angle ²
Center Beam Candle Power (CBCP) ²

¹¹ http://docketpublic.energy.ca.gov/PublicDocuments/15-AAER-06/TN206867_20151207T161554_Michael_McGaraghan_Comments_CA_IOU_Comments_on_Small_Diameter_D.pdf

4. As we noted in our previous comments to 45-day language, CEC has not set a minimum CRI for MR and SDDL. We again recommend a CRI of 80.
5. NEMA Proposal for MR/SDDL Performance Requirements
If the state wishes to have many manufacturers competing with high quality (above average) products widely available for consumers, CEC should lower the proposed levels by at least 15 lm/W, which would still eliminate over 20% of today's ENERGY STAR products from the market, and also adjust the compliance equation accordingly.

1605.3(k) (3)

(A) have luminous efficacy of ~~≥80~~60 lumens per watt.

(B) have a minimum luminous efficacy of ~~70~~55 lumens per watt or greater and a minimum compliance score of ~~465~~150 or greater, where compliance is calculated as the sum of the luminous efficacy and CRI.

(C) a CRI (Ra) of 80 or greater