

*Appliance Standards Awareness Project  
Northeast Energy Efficiency Partnerships  
Northwest Power & Conservation Council  
American Council for an Energy-Efficient Economy  
Southwest Energy Efficiency Project  
Consumer Federation of America  
Alliance for Energy Efficiency*

September 7, 2017

Ms. Lucy deButts  
U.S. Department of Energy  
Building Technologies Program  
Mailstop EE-5B  
1000 Independence Ave, SW  
Washington, DC 20585-0121

Docket Number: EERE-2017-BT-TP-0011

RIN: 1904-AD85

Dear Ms. deButts:

This letter contains the comments of the Appliance Standards Awareness Project, the Northeast Energy Efficiency Partnerships, the Northwest Power & Conservation Council, the American Council for an Energy Efficient Economy, the Southwest Energy Efficiency Project, the Consumer Federation of America, and the Alliance to Save Energy in response to the Department of Energy's Request for Information (RFI) on Test Procedures for General Service Fluorescent Lamps, General Service Incandescent Lamps, and Incandescent Reflector Lamps published August 8, 2017 (82 FR 37031). We commend the DOE on their efforts to maintain the integrity of product test procedures, and appreciate the opportunity to provide comments.

**We support DOE's proposal to update test procedures for GSFLs, IRLs and GSILs to bring them in line with latest industry practices provided that changes do not affect measured efficiency. We also call upon DOE to review the industry standards referenced by the GSFL, IRL and GSIL test procedures and to modify industry standards as necessary to produce appropriate test procedures.**

DOE notes in the RFI that EPCA directs the Department to take into consideration the applicable IESNA or ANSI standards when prescribing test procedures for GSFLs and IRLs in order to align DOE test procedures with latest industry practices for testing electric lamps. DOE also considers industry standards when prescribing test procedures for GSILs. DOE's test procedures for GSFLs and GSILs were

most recently amended on January 27, 2012 (77 FR 4203). The test procedure for IRLs was last updated on July 6, 2009 (74 FR 31829). Several of the referenced industry standards have been updated since these dates. In general, we support DOE adoption of the latest industry test procedures. However, if updated test procedures result in a change in measured energy use, DOE must also modify the energy conservation standard, unless the effect is *de minimus*. For example, in the RFI DOE raises the possibility that changing the voltage frequency at which a GSFL is tested can also affect its efficiency, as explained in the notice (82 FR 37034). It is also important for DOE to carefully review industry test procedures to ensure that test results provide reliable and accurate information.

**We strongly recommend that DOE retain the current requirements regarding test voltages for incandescent lamps without change.**

In this Request for Information, DOE requested feedback on a proposal to require that incandescent lamps be subject to the same voltage requirements as compact fluorescent lamps (CFL) and integrated light-emitting-diodes (LED) lamps. The test procedures for CFLs and LED lamps currently require that these lamps be tested at the voltage marked on the lamp which is accepted as the intended operating voltage. DOE's rationale for this proposal is that it would simplify testing requirements and reduce regulatory burden for manufacturers if incandescent lamps were subject to the same voltage requirements as CFLs and LEDs.

The RFI notes that the current requirements for testing voltages for incandescent lamps have been in place since May 29, 1997 (62 FR 29221, 29231-2). The terms "rated voltage with respect to incandescent lamps" and the associated "design voltage with respect to incandescent lamps" as currently defined in 10 CFR 430.2 provide sufficient flexibility to accommodate the different types of commercially available incandescent lamps while also protecting the integrity of the energy efficiency standards for GSIL.

We believe that it is appropriate for DOE to maintain different test procedures, including different test voltage requirements, for lamps which employ different technologies. In its proposal, DOE seems to be suggesting that the various kinds of general service lamps (GSLs as defined in 10 CFR 430.2) should be subject to similar technical requirements, which is consistent with the two final rules relating to the definition of general service lamps issued on January 19, 2017. We generally agree that if different lamps are intended to provide equivalent service that their performance should be evaluated in the same way. However, this does not mean that GSLs based on different technologies should be subjected to identical test procedures. DOE has developed different test procedures for GSLs which are GSILs, CFLs or LEDs in recognition of the fact that these different product categories produce light for general illumination using different technologies. CFLs and LEDs are often designed to maintain uniform power consumption and brightness across a range of operating voltages and it is therefore appropriate that they be tested at the voltage marked on the lamp. Incandescent lamps respond differently to changes in voltage and therefore a different approach is needed.

We believe that the proposed changes to testing voltage requirements for incandescent lamps could allow manufacturers to re-rate products in order to evade the current GSIL energy conservation standards. Residential and small business electric utility customers are the main consumers of medium base incandescent lamps in the US. Utilities provide these residential and small business customers with alternating current electricity at 120V. While many varieties of incandescent lamps are designed to operate at other voltages, most such lamps do not use medium screw bases. DOE's proposal would allow incandescent lamps with medium screw bases to be tested at a non-standard voltage marked on the lamp. By selecting a voltage for labeling and rating purposes that is below the standard grid voltage,

manufacturers could achieve lower rated lumen outputs, even though in actual usage in homes and businesses the lumen output will be significantly higher. Since GSILs are legally defined to have a minimum lumen output of 310 or less, manufacturer selection of a lower-than-standard voltage would enable manufacturers to potentially avoid the GSIL regulations even though in actual usage the lamp would provide 310 lumens or more.

To provide a simplified example, for an electric circuit consisting of an incandescent light bulb in a light fixture plugged into a standard electric socket, the current going through the circuit is equal to the voltage divided by the resistance:

$$I \text{ (current)} = V \text{ (voltage)} / R \text{ (resistance)}$$

Where “I” is the current (in amps), “V” is volts and “R” is resistance (in ohms).

Most of the resistance in this circuit is in the filament of the bulb. If the resistance of the filament remains constant, as the voltage increases the current going through the filament increases. An incandescent light bulb dissipates energy mostly as heat, but also as visible light, and the total energy is measured in Watts. The Watts dissipated by an incandescent lamp is a function of the square of the current:

$$\text{Watts} = I^2R$$

As voltage increases, the current going through the incandescent lamp increases linearly, and the amount of energy dissipated by the lamp’s filament increases exponentially. In other words, a lamp that produces 300 lumens at 100 V will be significantly brighter when operated at 120 V. Exactly how much brighter depends upon the design of the lamp.

In summary, GSILs are currently defined as medium base incandescent lamps with light output from 310 to 2600 lumens. DOE’s proposal would open a loophole that could allow incandescent lamps which produce more than 310 lumens when installed in typical residential and commercial general illumination applications to no longer be subject to the GSIL standards. This would enable unscrupulous importers or manufacturers to undermine the majority of manufacturers that provide more accurate voltage information.

Finally, as DOE recognizes in the RFI, the Energy Policy and Conservation Act (EPCA) requires that test procedures produce results that are “representative” of actual energy use (82 FR 37032). Allowing manufacturers to test lamps at labeled voltages that are seldom encountered in real-world general service lighting applications could yield results that are not representative of actual performance for the vast majority of end-users. Any modest benefits that might result from harmonizing the test procedure text across different lighting technologies would not justify a reduction in the consumer utility of measured values.

We appreciate the opportunity to provide these comments.

Sincerely,

(signatures on following page)



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