



April 7, 2008

Ladies and Gentlemen of the California Energy Commission:

The American Lighting Association appreciates the opportunity to work with the California Energy Commission and to assist you in meeting the residential lighting energy reduction goals as required by California Title 20 and Assembly Bill 1109 (Huffman).

We believe that the following ALA proposals are practical and workable and will achieve the results indicated more rapidly than other alternatives based upon the unique knowledge and experience of ALA members and, particularly, ALA lighting retailers who serve the California residential lighting market.

The formal ALA proposals are included in the following template. We realize, however, that portable lighting fixtures use less than 25% of California's residential lighting energy, so an essential part of the overall lighting energy reduction effort may be the continuing revision and development of the CA Title 24 residential lighting requirements. Even then, if we are to significantly reach the owners and users of the existing stock of inefficient residential lighting fixtures in California, it will, from our experience, take a substantial educational and promotional effort if change is to result.

We are, however, ready to help you with that task using our knowledge of the consumer lighting market and our abilities to reach the consumer/customer with technical, educational and promotional information.

Thank you.

Sincerely,

A handwritten signature in black ink, appearing to read "Clark Linstone".

Clark Linstone, CFO
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A handwritten signature in black ink, appearing to read "Terry McGowan".

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Proposal Information Template – Portable Lighting Fixtures - ALA

2008 Appliance Efficiency Standards

American Lighting Association – Clark Linstone, Dick Upton and Terry McGowan, April 7, 2008

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Purpose

This document is a report template to be used by researchers who are evaluating proposed changes to the California Energy Commission’s (Commission) appliance efficiency regulations (Title 20, Cal. Code Regs., §§ 1601 – 1608) This report specifically covers functional and decorative portable lighting fixtures, equipped with standard 120 volt cord and plug assemblies and designed for residential use (e.g. floor lamps, table lamps, task lamps and other portable functional/decorative lighting fixtures).

Background

The proposals developed by the American Lighting Association (ALA) in this document build upon the Proposal Template “Portable Lighting Fixtures” prepared by Steven Nadel, ACEEE, for the Pacific Gas and Electric Company, dated January 30, 2008 (CEC Docket No. 07-AAER-3)¹ and the more recent (4/3/08) “Analysis of Standards Options for Portable Lighting Fixtures”⁷. These ALA proposals have been designed with the objective of going further than the referenced proposals. We see an opportunity to more rapidly reduce the energy used by portable lighting fixtures in California by involving, not only new purchases by consumers, but also the large existing stock of portable lighting fixtures.

Currently, the most widely used (75% of residential lamp stock²) light source for portable lighting fixtures in California is the standard incandescent lamp in the “A-line” bulb with an Edison screw base providing 10-17 lumens/watt (lpw) and in typical sizes which range from 40 to 100 watts. There are also portable lighting fixtures used for functional lighting (reading, task work such as sewing and general room illumination) which utilize higher wattage lamps of, typically, 150 watts or 3-way lamps of 30-70-100 or 50-100-150 watts. While 3-way lamps are important from the application standpoint, they are low volume and energy-use products (e.g. 3-way lamps are less than 3% of the market⁵).

The sale of more efficient compact fluorescent lamps as an energy-efficient direct replacement for standard incandescent lamps has grown in California (1% in 2000 vs. 9% in

2005⁴) so that, currently, more than 15% of California's portable lighting fixture in-use stock uses CFLs⁴. This indicates that consumers are responding to costs, energy concerns, educational and promotional information.

The American Lighting Association (ALA) is a trade association with over 1500 members representing residential lighting fixture, lamp, components, controls and ceiling fan manufacturers, manufacturers reps., retail lighting showrooms and lighting designers.

The California ALA membership totals 138 including 10 designers, 25 manufacturers, 23 manufacturer representatives and 80 member retail showrooms with 127 locations. The ALA has a strong record of energy-efficiency program support. The ALA, for example is a founding sponsor and manager of the Lighting for Tomorrow energy efficient residential lighting fixture design program which is also sponsored by some 26 electric utilities and state energy offices including SDG&E, SCE, SMUD and PG&E in California. The LFT program is now in its sixth year with the number of entries and the availability of energy-efficient residential lighting fixtures increasing each year.

The ALA ,along with its individual members, also supports the national voluntary Energy Star[®] lamp and luminaire programs in the U.S. and Canada and, as part of that support, spearheaded the development of the new GU-24 line-voltage socket. This socket is an alternative to Edison medium screw-base sockets (E-26), but allows only the installation and use of high efficiency light sources in lighting fixtures including portable products.

Finally, the ALA has an extensive curriculum of member education programs, which include an emphasis on energy-efficiency. The ALA delivers program sessions at national conferences, locally and on-line to about 5,000 lighting professionals each year. The consumer receives this information via lighting retailers, the ALA website, brochures and media releases.

Overview

The majority of portable lighting fixtures for residential use can presently be purchased with one of the following three types of lamp sockets:

Type 1. Standard Edison screw. Such sockets are typically, medium (E26) base, but intermediate (E17) and candelabra (E12) bases are supplied in some smaller and multiple-lamp portable lighting fixtures).

Type 2. GU-24. A new base designed to replace the standard medium-screw base; but only for use with energy-efficient CFL and LED light sources. This base is included in the requirements for EPA/Energy Star[®] luminaires (V4.1 effective 8/1/08⁶) and efforts are underway in both UL and CSA to harmonize their respective standards so that listed lighting fixtures incorporating the GU-24 can only be used with energy-efficient light sources.

Type 3. Compact fluorescent lamp base (2 or 4-pin encompassing several sub types). This type of base is directly wired to a fluorescent lamp ballast and, by design, is restricted to the use of the specific types of fluorescent lamps that are matched to that ballast. Dedicated bases of this type are also included in the requirements for EPA/Energy Star[®] luminaires⁶.

These portable lighting fixture sockets cannot be changed either by the retailer or by the consumer without affecting the UL or CSA listing since the portable fixture, if tested and listed for electrical and fire safety, must be tested with the lamp and socket with which it is to be used and that process is handled by the portable fixture manufacturer. In the case of screw-base incandescent lamps, a label is attached to the lighting fixture indicating the maximum lamp wattage permitted. Manufacturers who catalog portable fixture products with more than one type of socket option must complete the listing process for each product type.

Sockets types 2 and 3 can utilize only energy-efficient lamps so the challenge, from the ALA viewpoint, is to reduce the energy used by socket type 1 which is not only the most widely-used socket in the existing fixture stock, but also, at least currently, the type most widely sold with new portable lighting fixtures.

<p>Description of Standards Proposal</p>	<p>Proposal I. To be effective January 1, 2010</p> <p>All new single and multiple-socket portable lighting fixtures sold in California are to be equipped with one of the following:</p> <p>A. Medium base (E26) adjustable, dimmer-controlled sockets rated for 150 watts maximum and marked for use with either incandescent or dimmable, integrally-ballasted CFL lamps.</p> <p>or</p> <p>B. GU-24 line-voltage sockets for use with GU-24 based integral compact fluorescent lamps.</p> <p>or</p> <p>C. Dedicated 2 or 4-pin sockets wired to appropriate fluorescent ballasts.</p> <p>This proposal is to apply to all portable lighting fixture products which would otherwise be sold with a standard (E26) single-level (on/off) or non-controllable socket. All other socket types intended for use with smaller incandescent and halogen incandescent lamps such as G4, GY 6.35, a G9 base, or a Bayonet base socket (B15d) are exempted since these comprise only about 4% of residential sockets², already use more efficacious light sources such as halogen lamps or are physically designed such that CFLs will not fit into the fixture.</p> <p>Proposal II. To be effective January 1, 2010</p> <p>A voluntary program of portable lamp conversions is to be organized and offered to California portable lamp retailers and electrical repair shops. The program objective is to provide, for a modest fee (in the range of \$15-25), conversion of customer-owned portable lamps with existing medium screw-base sockets to socket types A or B above.</p> <p>Proposal III. To be effective June 1, 2010</p> <p>To broaden the appeal of the conversion effort to both retailers and consumers, an additional voluntary program is to be developed that “instantly” adapts existing medium screw-base sockets in portable lamps to GU-24 sockets via a UL-listed socket adapter. The adapter, which is to be specified and UL rated for use “such that, once installed, it cannot be removed without disabling damage to the original socket” is to be provided and installed by the retailer or repair shop offering the conversion. An appropriate GU-24 based, Energy Star rated, integrally-ballasted CFL is to be included in the conversion. The ALA would welcome the participation of the CLTC in developing an acceptable socket adapter perhaps via the CEC PIER Program.</p>
<p>2008 California Appliance Efficiency Standards ALA Proposals – Portable Lamps</p>	<p>[4-7-08]</p>

<p>Description of Standards Proposal (cont'd)</p>	<p>Proposal IV. To be effective with the implementation of the respective programs above</p> <p>Associated with Proposals II and III, a corresponding incentive program is proposed with the following schedule:</p> <p>a) \$20 Rebate Coupon toward the trade-in of an existing, customer-owned standard medium-based portable lighting fixture for a new energy-efficient portable lighting fixture.</p> <p>b) \$10 Rebate Coupon toward the conversion (complete replacement of sockets) cost of an existing customer-owned portable lighting fixture to socket types A or B above.</p> <p>c) \$5 Rebate Coupon toward an “instant” conversion of an existing customer-owned portable lighting fixture with standard medium-base socket(s) to GU-24 socket(s) and included CFL lamp(s).</p> <p>The rebates above are intended to be used by consumers at their point-of-purchase and administered through electric utilities with funding from public benefit funds.</p>
<p>California Stock and Sales</p>	<p>There are an estimated 58-65 million portable lamps currently in use in California or about 4.5 per home. This stock is expected to grow to 75-85 million units by 2030^{2,3,4,7}</p> <p>Annual sales = 3.7- 4.2 million units</p> <p>Note that, with current sales volume, replacement of existing stock will take more than 15 years. According to ALA retailers, such figures do not account for the significant existing stock of older portable lighting fixtures with standard Edison screw-base sockets which are retained for family, aesthetic or historical reasons. That stock could, however, be reached via ALA Proposals II or III.</p>

<p>Energy Savings and Demand Reduction</p>	<p>The baseline estimate of residential lighting energy use in California is 14,000 GWh/year. Of that, some 3200 GWh/year or 23% are estimated to be used by portable lighting fixtures which draw, on average, 66.5 watts/fixture^{2,7}.</p> <p>The ALA proposals are designed to reach a high proportion of new and existing fixtures so that average fixture watts are reduced over time by more than 30% to about 45 watts/fixture. The resulting energy savings, considering household growth and assuming that burning hours remained at the current average level of 840 hours/year, would be about 2500 GWh/year or a drop of 22% for a savings of 732 GWh/year. How quickly that would happen depends upon the incentive levels, in our view; but it could probably be done over a 5-year period since the large inventory of existing sockets could be reached.</p>
<p>Economic Analysis</p>	<p>There has not been an opportunity to do a complete economic analysis; however, the ALA proposals work within the existing lighting industry marketing structure, add consumer value (both real and perceived) and expand upon the efforts already underway to replace or adapt existing portable lighting fixture sockets to use more efficacious light sources.</p>
<p>Non-Energy Benefits & Concerns</p>	<p>The ALA proposals take into account the need of consumers to continue to tailor their residential lighting to their task and aesthetic needs using existing or new lighting fixtures. This flexibility has become even more important as an aging population requires more light.</p> <p>Consumer buy-in and involvement are crucial to this effort. The ALA proposals are sensitive to customer concerns about the price of new fixtures which, unfortunately, in the case of Energy Star[®] designs still have a cost premium of \$25-40 at retail. There is also a limited selection of residential portable fixtures in the program. EPA/Energy Star[®] reports that of the 11,000 Energy Star[®] fixtures now available, only about 300 are portable fixtures⁸.</p> <p>It is therefore essential to the success of the California program to improve the efficacy of existing fixtures, including new non- Energy Star[®] fixture models sold retail at a modest cost.</p> <p>With the rapid growth of internet residential lighting fixture sales, California shoppers will find what they want where they can. The ALA proposals seek to keep that energy-efficient fixture sale inside California along with the associated sales and tax revenue.</p>

<p>Environmental Impacts</p>	<p>The ALA proposals primarily deal with lighting fixture products that utilize glass, metals, ceramics, resins and woods - both new and recycled. Such products are increasingly being designed or redesigned to meet the requirements of California Proposition 65 or the appropriate RoHS directives if sold internationally. Standard CFL or LED light sources are expected to be used and their environmental impacts have been described elsewhere².</p> <p>Environmental benefits result when existing fixture stock is converted and used more efficiently.</p> <p>Of course any reduction in watts of lighting fixtures used for interior residential lighting also reduces the heat load into air conditioned spaces in direct proportion to that wattage reduction.</p> <p>Implementing the ALA proposals does not involve any unusual manufacturing, packaging, shipping or installation considerations.</p>
<p>Acceptance Issues</p>	<p>Given the benefits and customer flexibility built into the ALA proposals, no serious acceptance issues are expected. Rather, the customer may well use the opportunities offered by the implementation of the proposals to learn more about lighting and energy while upgrading their personal home lighting environment.</p>
<p>AB 1109 (California Lighting Efficiency and Toxics Reduction Act)</p> <p><i>[if applicable]</i></p>	<p>Addressed above.</p>
<p>Federal Preemption or other Regulatory or Legislative Considerations</p>	<p>Lighting fixture products involved in the ALA proposals are currently not regulated federally except for torchiers (torchieres are limited to a maximum of 190 watts) and EPA/ENERGY STAR[®] program requirements⁶. The ALA is aware of no other plans on the federal level to regulate residential lighting fixtures.</p> <p>As ALA-sponsored programs such as Lighting for Tomorrow add to the quantity, quality and availability of Energy Star portable lighting fixtures in the market, the viability of the ALA proposals is enhanced.</p>

Methodology

The methodology and assumptions used in these ALA proposals builds upon the statistical models reported in **Efficiency Opportunities for Edison-Based Luminaires²**.

Analysis and Results

Discussed above.

Recommendations

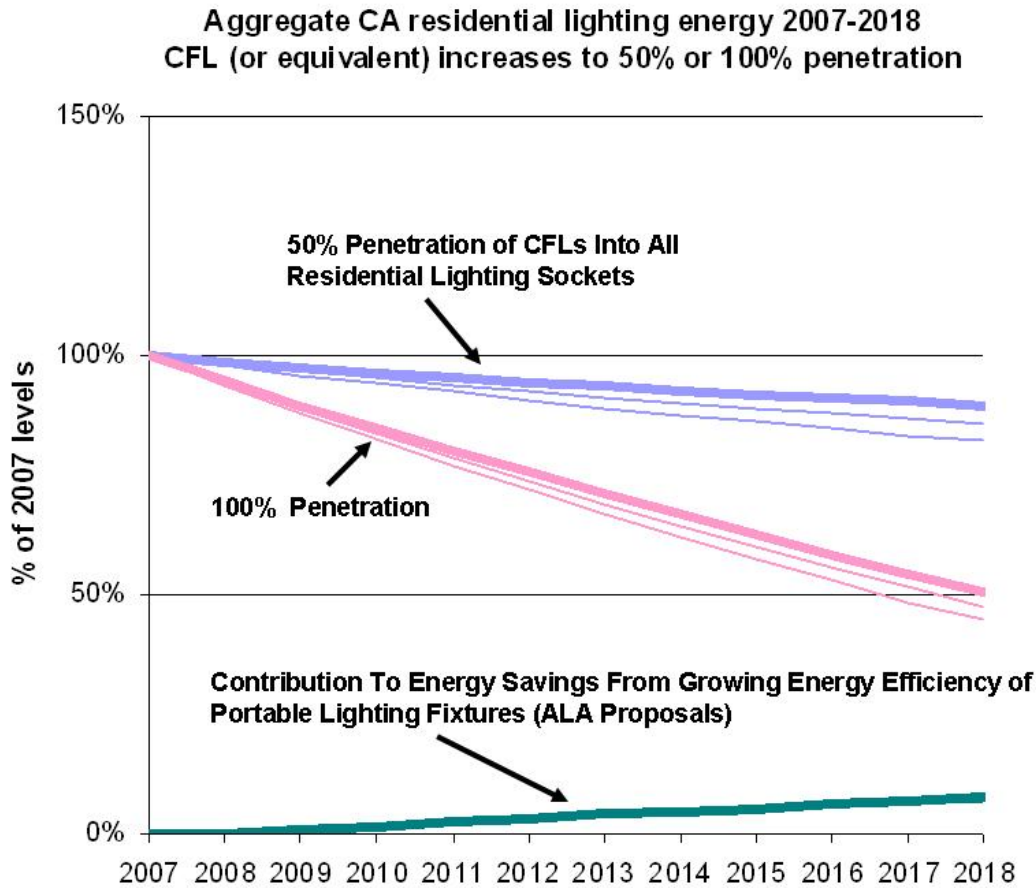
These ALA proposals are designed to rapidly increase the overall efficacy of new residential portable lighting fixtures sold at retail as well as the existing stock of portable lighting fixtures used in homes. Our estimate is that, given the implementation of the proposals above, the average wattage per portable lighting fixture will drop from 67 watts to 45 watts by 2018, or sooner depending upon incentives and promotional activity, Total energy savings will climb to 700+ GWh/year during that period. The graphs in the appendix illustrate the results.

Bibliography and Other Research

1. Proposal Information Template for: **Portable Lighting Fixtures**. Prepared by Steven Nadel, ACEEE. CEC Docket No. 07-AAER-3. January 30, 2008.
2. **Efficiency Opportunities for Edison-Based Luminaires**. Consultant Report. California Lighting Technology Center. January, 2008. CEC-400-2008-001
3. **U.S. Lighting Market Characterization, Volume I: National Lighting Inventory and Energy Consumption Estimate**. Navigant Consulting, Inc. for U.S. Dept. of Energy. September, 2002.
4. **California Lighting and Appliance Efficiency Saturation Study (CLASS)**. RLW Analytics. 2005.
5. Pamela Horner, Osram-Sylvania. Private correspondence.
6. **ENERGY STAR[®] Program Requirements for Residential Light Fixtures**. Version 4.1 (Effective August 1, 2008). U.S. EPA. See: http://www.energystar.gov/ia/partners/prod_development/revisions/downloads/fixtures/RLF_V4_1_FINALSpec.pdf
7. **Codes and Standards Enhancement (CASE) Initiative for PY2008: Title 20 Standards Development, Analysis of Standards Options for Portable Lighting Fixtures** for Pacific Gas and Electric Co. by Jennifer Thorne Amann and Steve Nadel, ACEEE. April 3, 2008.
8. Alex Baker, EPA/Energy Star[®]. Personal communication, 4/08.

Appendix

In the study, **Efficiency Opportunities for Edison-Based Luminaires**. Consultant Report. California Lighting Technology Center. January, 2008², a simulation model illustrates the residential lighting energy reduction result of a 50% and 100% penetration of CFLs or other light sources of similar efficacy as they replace less efficient lighting (Figs 6A and 7A). Three population growth assumptions and the impact of 2005 Title 24 requirements are incorporated into the curves. The two figures have been combined as pictured below.



The added green curve (bottom) represents the potential energy savings from portable lamps, assuming the ALA proposals are implemented, that grow and accrue over time and which would contribute some 700+ GWh/year to the overall savings by 2018.