NRDC Comments on FTC Proceeding to Establish Updated Lighting Labeling Requirements

FTC Lamp Labeling, Project No. P084206

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On behalf of the Natural Resources Defense Council and its more than 1 million members and e-activists, enclosed is our input on key issues related to the design and content of the new lighting labeling requirements that are being developed by the Federal Trade Commission. Our comments focus on the following areas: scope, method for communicating light output and efficiency, cost of operation, light quality, lifetime, label design, interaction with ENERGY STAR label, and approaches FTC can take to standardize future lighting related claims.

Given the rapid changes in this market and the new bulb efficiency requirements set by EISA, the federal energy bill of 2007 that will phase out today's inefficient incandescent light bulbs beginning in 2012, consumers will need improved methods for selecting their new light bulb. A well designed label will help consumers:

- Select the bulb that provides the desired amount of light,
- Compare the operating costs (and ideally the total life cycle cost) of bulbs with similar light output,
- Determine if the bulb they are buying is an efficient one or not,
- Identify the lamp's rated lifetime.

Scope

The current FTC labeling requirements do not cover many lamp types. An effective system would cover all lamp types regardless of the lamp's shape, base type, or technology. For example, today's requirements apply to general service incandescent

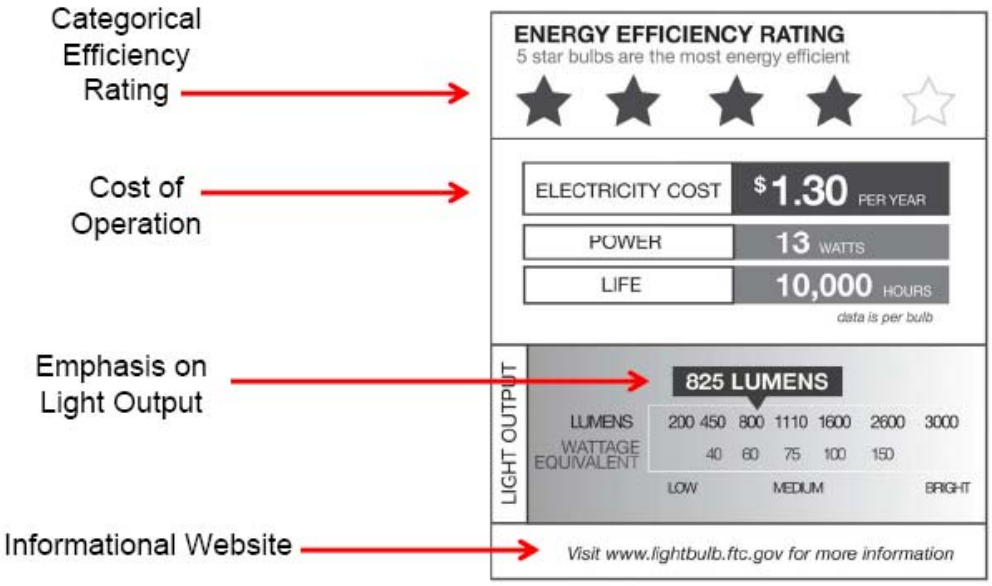
lamps, but do not require any light output information on a screw based halogen lamp that consumes a whopping 300W and is very inefficient. We urge the FTC to develop a very inclusive program that would cover all lamp types. The system should also be sufficiently open ended to ensure that lamp technologies not yet on the market today such as screw based solid state lighting (also referred to as LEDs) products will be covered by the labeling program.

Light Output and Efficiency

US consumers have historically based their lighting purchases on the bulb's power use. Their reference point has become 40, 60, 75, 100 and 150 Watt incandescent lamps. Today's much more efficient compact fluorescent lamps (CFLs) use ¼ the power of today's incandescents – thus a 25W CFL replaces a 100W incandescent while providing the same amount of light. CFL packages continue to prominently display claims like "replaces 100W bulb," "25W = 100W," or "as bright as 100W bulb." In an ideal world the consumer would shop for the amount of light they desire, expressed in lumens, and then buy the most efficient and cost effective model available.

In anticipation of this rulemaking, NRDC and its consultant Ecos Consulting pursued joint research to develop a prototype label for FTC's consideration. A sample we created is provided below:

New Label Prototype



We based our design on the following considerations:

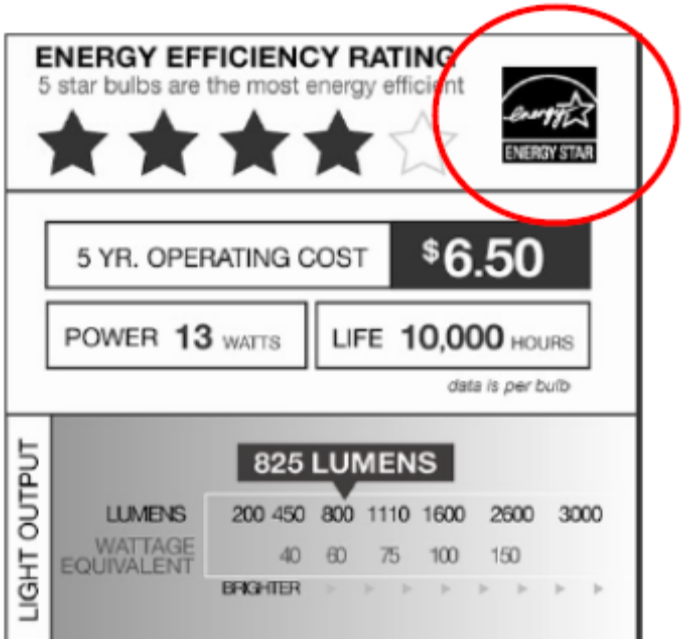
Wattage/Lumen Equivalences – Over the next five years or so consumers will need some way to compare the new bulb offerings to their existing 40, 60, 75 and 100W bulb shopping mindset. To accommodate this, our label provides: a) prominence to the light output level – lumens, and b) a scale underneath showing how the light output level compares to today's common bulb offerings. This is a transitional approach and we are hopeful that in the long term labels will simply include light output levels and discontinue ongoing comparisons to the power used by today's inefficient incandescent light bulbs. Follow-up FTC sponsored consumer research could help determine the optimal terminology to describe "wattage equivalent" or "old incandescent equivalent".

Not necessary to require LPW data on the label – Our experience suggests that a very small majority of bulb purchasers know how many lumens they are shopping for. An even smaller fraction know that efficacy is expressed in lumens per watt (LPW), let alone how many LPW to look for or even that higher efficacy is better. Manufacturers who want to present efficacy information on the package should be allowed to but not be required to.

Utilize a categorical labeling system – Individual consumers, institutional purchasers, and policy makers are increasingly interested in energy efficiency and should be provided with a means to easily distinguish between the efficiency provided by competing models. This trend is likely to only increase with the growing concerns surrounding sustainability and global warming. We recommend a 1 to 5 star rating system as the means to most effectively communicate the lamp's efficiency (more stars represents greater energy efficiency). In making this recommendation we reviewed various categorical rating systems around the world. It should be noted that such systems are used in energy use labels around the world in both developed and emerging economies with great success. Samples are provided in Appendix 2.

All of these employ a visually simple and easy to understand comparative rating system. These systems not only allow the consumer to identify the more efficient models on the market but as importantly allow a consumer to identify the least efficient ones (e.g. the "Energy Hogs") on the market. They use a 1 to 5 star system, a 1 to 5 or letter scale (A to H scale.). We recommended a 1 to 5 star system as we felt it was the most consumer-friendly and unambiguous. The other systems could create some confusion – e.g. is a 1 best or is a higher number better; similarly is A best, as in US school grades, etc.

We firmly believe the proposed star system is completely compatible with the EPA and DOE ENERGY STAR system. Those models that meet ENERGY STAR's requirements could also show the ENERGY STAR symbol on the label. Below is a sample of how that might appear.



Given some of the confusion on this topic at the 9/15/08 hearing, we want to take a moment to provide some additional information on the ENERGY STAR program, of which NRDC is a long time supporter. Unlike most of its specifications, ENERGY STAR's lamp specification is technology specific. While ENERGY STAR does have a specification for CFLs, they do NOT have one for other lamp technologies. For example a super efficient incandescent light bulb akin to those promoted by GE[1] (see release: http://www.geconsumerproducts.com/pressroom/press_releases/lighting/new_products/HE_lamps_07.htm) or for that matter super efficient LED light bulbs are not covered by today's ENERGY STAR program. The star system proposed above would provide a means to distinguish between relatively inefficient lamps, those with modest efficient improvement, and existing and future highly efficient technologies. ENERGY STAR as currently constructed does not provide this capability. For example, once GE's second generation lamp hits the market at efficacy levels like today's CFLs, there would be no way to convey its high efficiency via ENERGY STAR.

In addition, energy efficiency is just one of more than a dozen parameters contained in the ENERGY STAR CFL spec. Other parameters include start time, lifetime, lumen maintenance, mercury level, etc. In this case, the ENERGY STAR specification is more of a quality label than a label meant to simply identify the very best CFLs on the market from purely an energy efficiency point of view. Virtually all CFLs on the

[1] According to GE's press release, the target for these bulbs at initial production is to be nearly twice as efficient, at 30 lumens–per–watt, as current incandescent bulbs. Ultimately the high efficiency lamp (HEI) technology is expected to be about four times as efficient as current incandescent bulbs and comparable to CFL bulbs.

market today meet ENERGY STAR's efficiency level. The system we propose would also provide a means for consumers to distinguish between the efficiency of the typical ENERGY STAR CFL, which would earn 4 stars, as opposed to a super efficient ENERGY STAR CFL at 70 LPW or better, which would have 5 stars.

More information on how the 1 to 5 star energy efficiency rating system would be applied is provided in Appendix 1. In brief, the system would apply to all lighting technologies and the system would provide an easy to understand means to compare the efficiency of lamps of similar light output.

Require Placement of Lumens on the Bulb – In addition to the above points on light output, we believe it would be extremely helpful to require manufacturers to include the light output on the lamp itself. This could be done on the plastic base or the glass itself. Today's lamps already show the bulb's power (e.g. 60W) on the glass, whereas CFLs list the power on the base. When shopping for a replacement, the consumer or their housemate will look at the burned out bulb and say "pick up a 60W" when you are at the store. They should instead be saying buy a 800 Lumen bulb. Putting the light output directly on the bulb will help the consumer when they need to replace the existing bulb when it fails.

Operating Costs and Lifetime

One of the reasons many consumers continue to buy inefficient light bulbs instead of CFLs is because of their lower first cost. Many incorrectly assume today's incandescent is a better deal financially than a CFL. For example, the 25 cent 100W incandescent light bulb costs roughly $10/yr to operate compared to the $2 25W CFL that costs roughly $2.50/yr to operate.(both lamp costs assume purchase of a 4 pack) In this case, although the CFL cost $1.75 more at the register, it saves the consumer $7.50 in yearly electric costs and will save the consumer around $45 over the lifetime of the CFL. Today's FTC package requirements do NOT include anything on operating cost. While CFL marketers prominently display on CFLs the estimated savings they provide, the incandescent packages are totally silent on operating costs. Today the consumer who only looks at the incandescent light package is therefore denied the crucial operating cost information when they are making the purchasing decision.

We urge the FTC to:

1. Require operating costs and rated lifetime expressed in $/yr and hours, respectively, be included within FTC's new required package labels.

2. Create a set of standardized assumptions upon which operating cost and savings claims are made. These would include: national average electricity use (cents per kWh), and annual operating hours (hours/yr). At a minimum these claims should be made on a per bulb basis.

As part of our research we considered various options for communicating operating life and costs.

- Total lifecycle cost – While it is very appealing to provide total lifecycle costs to consumers, implementation of such a measure proves difficult. Since retail cost could vary dramatically between retailers, and change rapidly over time, we decided it would not be possible to assume an accurate bulb purchase cost. This prevents one from creating a reliable total lifecycle cost number that could be applied nationally and remain meaningful over any extended period of time.

- One Year vs. Bulb Life – We recommend FTC base their label on a 1 year operating cost. This conveniently lines up with the new lamp minimum life of 1,000 hours in EISA. (3 hours x 365 day/yr). Some in the meeting proposed showing operating cost over the life of the bulb. Such a system could result in an unfair comparison between an inefficient, short life bulb against an efficient but extremely long lasting bulb. In an extreme case the lamp with the much lower annual operating cost would look worse simply because it is rated to last 20 years, as in the case of future LED lamps. A one year operating cost ensures a fair side by side comparison between lamps of varying lifetimes and efficiencies.

Light Quality

During the 9/15/08 meeting many stakeholders reiterated the need for some way to clearly and consistently communicate color to consumers. The way to achieve this is to establish a set of consensus descriptors such as warm white, daylight, etc that would correspond to specific correlated color temperature ranges. We encourage the industry and other stakeholders to provide a consensus proposal to FTC on this topic building upon the ENERGY STAR funded research that was previously done by the Lighting Research Center (LRC) a year ago.

We feel this approach makes the most sense as very few consumers are expected to know what the terms color correlated temperature (CCT) or color rendering index mean let alone what number they are looking for. For example, counter to common sense, a 5600K temperature lamps provides “cooler” light than a 2700K lamp that is typically marketed as “warm white” light.

As we expressed in the 9/15/08 hearing, EISA sets a minimum CRI of 80, which will ensure reasonably good color rendering of all future lamps. Any improvements above 80 will be marginal and not readily apparent to most consumers. Interested manufacturers could place the CRI on the package if they desire, but given the limited real estate available we don’t think this should be required. This would allow manufacturers who market a product to the commercial market, which might be more sensitive to this topic, to provide such information if they choose to.

RECOMMENDATIONS

Building from our written comments above, we provide FTC with the following recommendations for its consideration as it develops future lamp labeling requirements:

1. Develop an expansive scope that ensures nearly all lamps being sold are covered by the labeling rules, regardless of lamp shape, base type, or lamp technology.

2. Establish a set of minimum parameters that MUST be included on the label along with the rules that go along with each parameter. We recommend these include: light output, operating cost, lifetime, power and a means to easily assess efficiency. FTC shall establish the test methods to be used and the means for making certain calculations such as operating cost, which we assert should be expressed as an annual operating cost.

   In addition, FTC shall set regulations for other parameters where necessary to ensure claim consistency and accuracy. These parameters would be optional and include things like savings claims and color quality.

3. Utilize a categorical rating system to identify the lamp's energy efficiency. Consider the NRDC proposal based on a 1 to 5 star rating system and if necessary include it in the follow-up consumer research for further refinement. Such a system must be technology neutral and universally applied (e.g. it would be equally applied to CFLs, incandescents, LEDs, halogens, etc.) as opposed to a separate star system for each technology class.

   Assign DOE the responsibility of setting the efficiency levels associated with each star level in consultation with a mandatory stakeholder advisory group that consists of interested manufacturers, retailers, and efficiency advocates. DOE shall be required to update these levels at least once every 3 years.

4. Require all lamps to include lumen output levels on the lamp itself, not just the package.

5. Provide detailed requirements of the label design, including minimum font size, shading, etc for key parameters. For example, provide the rules on how to ensure that light output is communicated in a more prominent way than power. Should FTC choose not to require the label appear on the front of the package, then it should at a minimum require the lamp's light output to be prominently displayed on the front.

6. Establish a website such as www.lightbulb.ftc.gov to store related information for interested parties to retrieve. It would contain things like the assumed national average electricity rate, hours of operation assumed to calculate operating costs, and the basis for establishing the 1 to 5 star system. More information on the color descriptors could also be posted there. This helps

minimize the amount of information that would need to be included on the very limited real estate provided by lamp packages.

Appendix 1 – Details on How a One to Five Star Efficiency Rating System For Lamp Labels Should be Designed

NRDC and its consultant Ecos Consulting considered various ways to establish the critieria for assigning lamps with a 1 to 5 star rating for their energy efficiency. Below we present the options we considered and our recommendations on how the system should be designed and implemented.

How Would It Work?

As discussed in the main body of these comments, a simple way to communicate lamp efficiency is needed and a 1 to 5 star system was proposed. This system would apply equally to all technologies. A chart and/or plot would be created that shows the efficiency levels that would need to be achieved for a given star level for a specific light output level. In other words, using the lamp's light output level and efficacy, you would then look up the number of stars to rate that specific lamp. All of this would be ultimately managed by DOE and FTC and updated on a 3 year cycle, to reflect changes that might be occurring in the market. This info could also be posted on an FTC website such as www.lightbulb.ftc.gov

One must **not** create a system that creates separate rating systems for incandescents, halogens, CFLs, LEDs, etc. This would be very bad policy as the best halogen on the market could earn 5 stars with an efficacy of 35 LPW, and sit on the shelf next to one of the less efficient CFL offerings with a higher efficacy of 45 LPW, yet only earn 1 star relative to other CFLs. In this case the less efficient product would be showing a higher efficiency rating.

What Would it Look Like?

Our initial proposal, which is meant to serve as a strawman for FTC, would appear as:

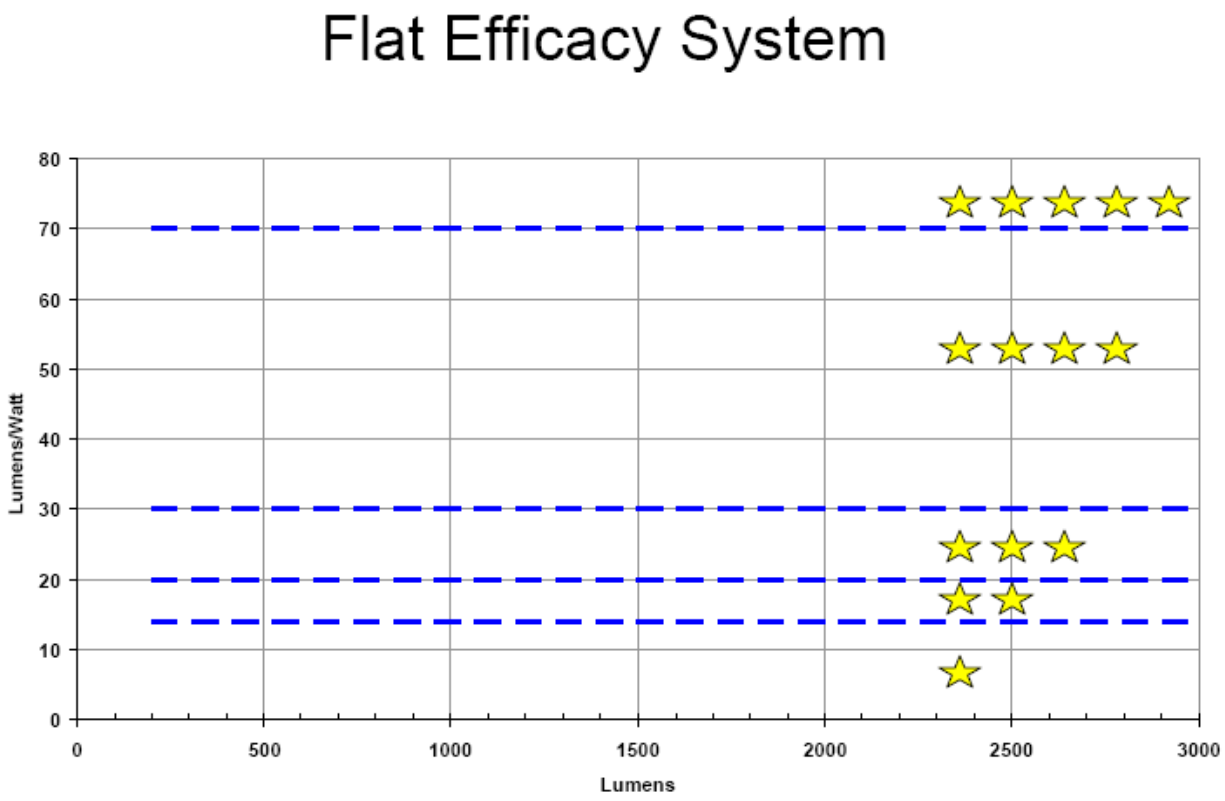
Efficiency rating system developed for proposed label:

- 1 star = least efficient
- 5 stars = most efficient

This information would be required to be displayed within the FTC lamp label on the package.

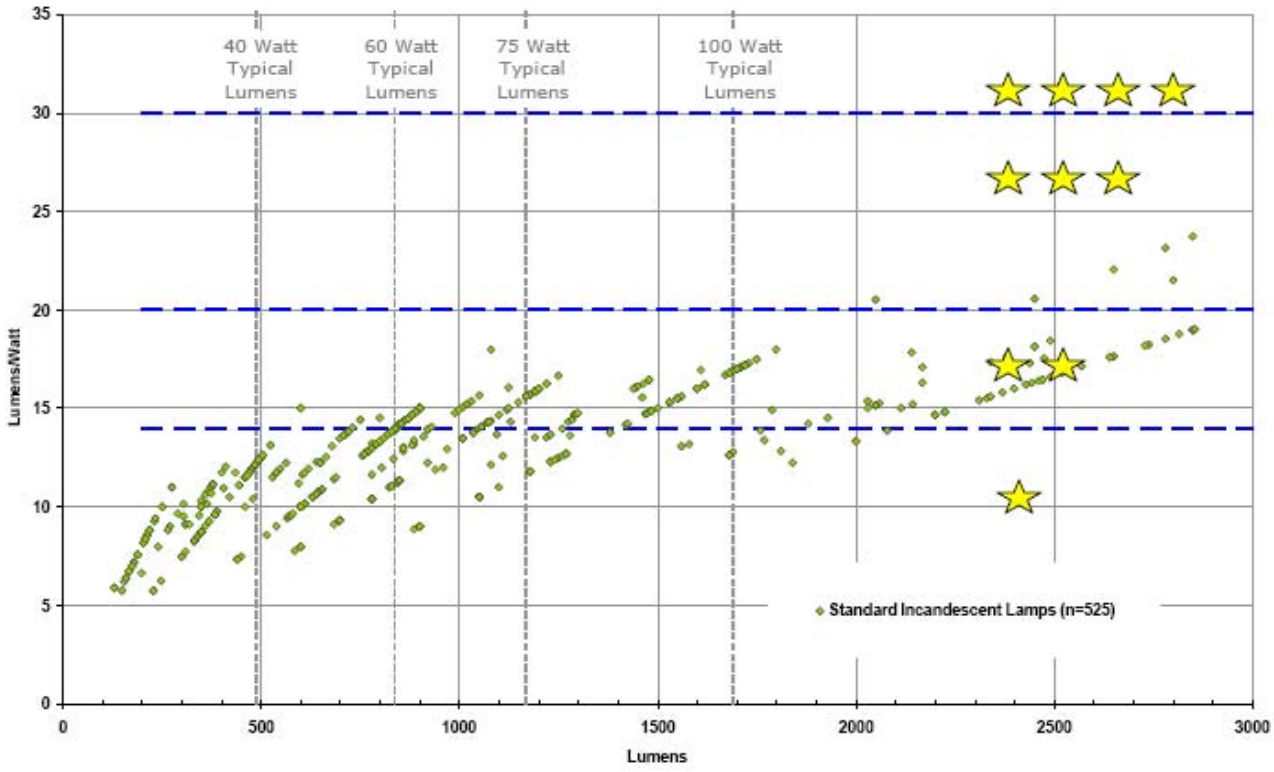
How Could Star Ratings Be Assigned?

The simplest method would be to adopt flat efficacy lines. This is depicted in the plot shown below:



We populate the above plot with actual incandescent products on the market today.

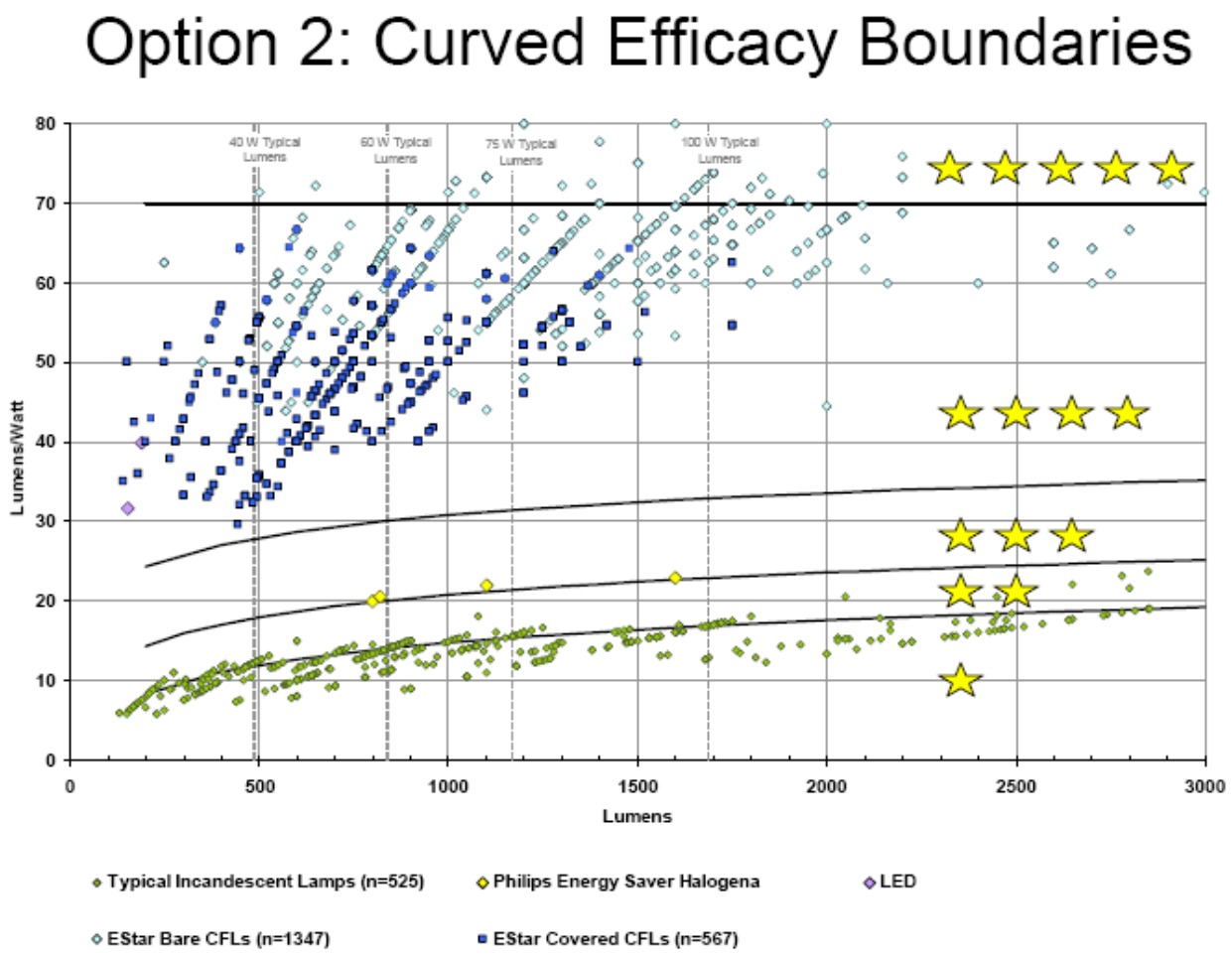
Option 1: Flat Efficacy System



- Pros:
  - Simple metric. Easy to understand
- Cons:
  - In reality, lamp efficacy rises with brightness
  - Flat efficacy categories would overstate efficiency of high lumen lamps and understate the efficiency of low lumen lamps
  - Could cause consumers to purchase lamps that are brighter (and higher power) than they need, leading to an increase in lighting energy

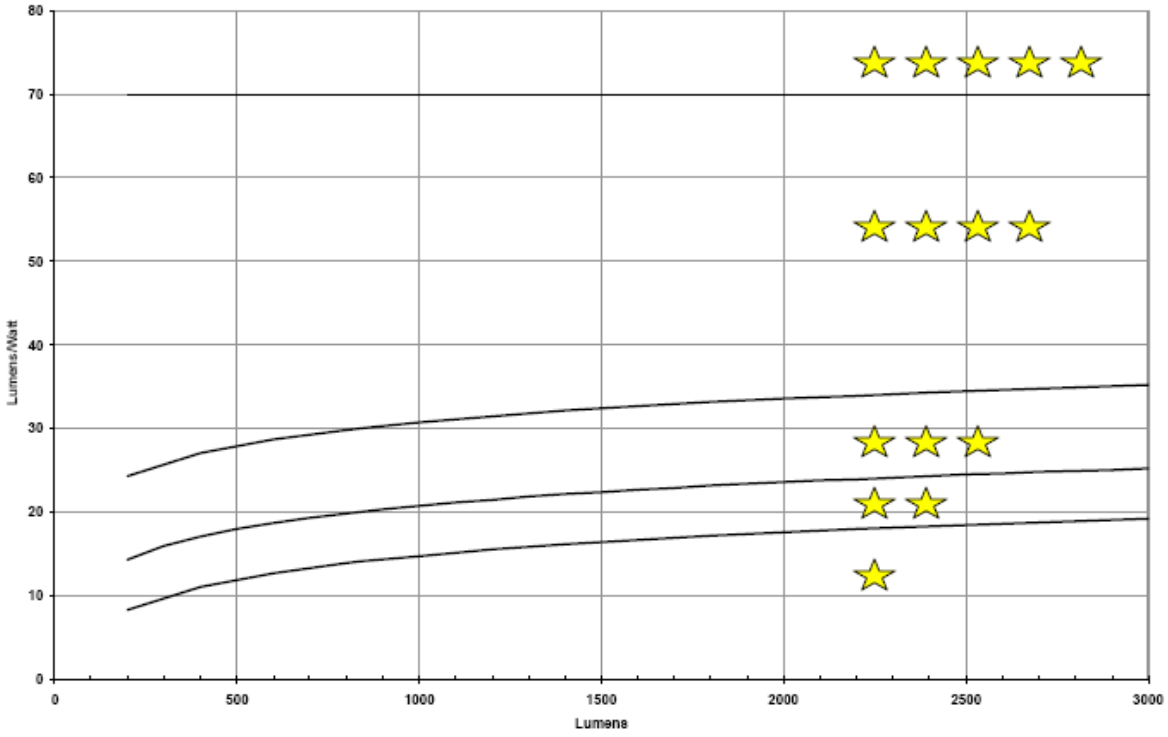
After reviewing the pros and cons of this approach we recommended against it, and opted instead in favor of the slightly more complex but more accurate system based on a set of efficacy curves. These curves more accurately mimic actual lamp technology performance.

A plot of current technologies is shown below along with a set of recommended curves for each star level.



For visual clarity we present these curves below with the performance data removed.

Option 2: Curved Efficacy Boundaries



Below is a high level summary of how various technologies would likely be rated under this system:

Categorization of Lamps

1 Star
- Least efficient incandescents
- Most incandescent modified spectrum lamps

2 Stars
- More efficient typical incandescents
- Many (but not all) of the lamps designed to meet CA Tier 2

3 Stars
- High efficiency incandescents (i.e. halogen IR)
- Least efficient CFLs

4 Stars
- Majority of today's ENERGY STAR CFLs
- Today's LEDs

5 Stars
- Best-in-class CFLs
- Future LEDs

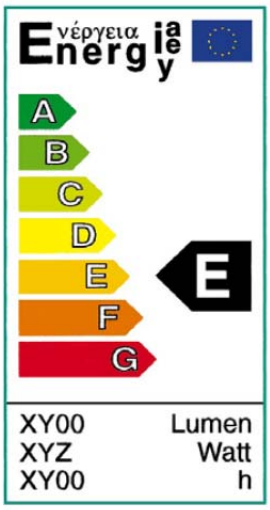
Implementation

We recommend FTC assign the task of establishing the levels for each star to DOE based on the proposed system outlined in this document. DOE should be required to create an advisory task force to serve as a forum for collecting stakeholder input and to ensure DOE has all the latest efficacy data. **While the details of this system are slightly complex, the consumer facing side is quite simple.** Efficiency is presented merely on a 1 to 5 star scale, with 5 stars representing the most efficient. This is similar to federal car safety ratings and numerous other categorical systems that are deployed around the world.

Appendix 2 - Sample Categorical Energy Rating Labels

Thailand

EU



Korea