DOCKETED	
Docket Number:	17-AAER-07
Project Title:	General Service Lamps
TN #:	224605
Document Title:	Presentation - Industry Comments on CEC Draft Staff Report - Analysis of General Service Lamps (Expanded Scope)
Description:	By Joseph G. Howley - Comments on CEC Draft Staff Report 2018 GSL v2 for August 28, 2018, General Service Lamp (Expanded Scope)
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Submitter Role:	Public
Submission Date:	8/27/2018 1:29:56 PM
Docketed Date:	8/27/2018

Industry Comments on CEC Draft Staff Report

Analysis of General Service Lamps (Expanded Scope)

2018 Appliance Efficiency Pre-Rulemaking

Docket Number 17-AAER-07

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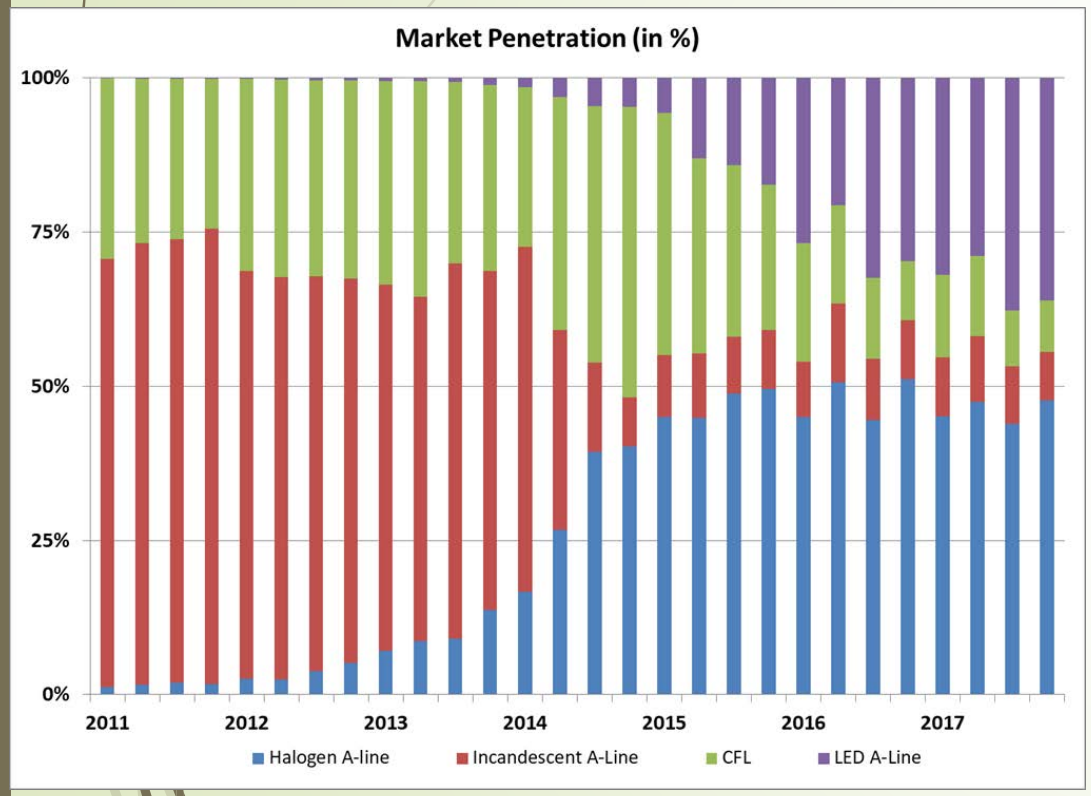
August 28, 2018

Figure 3-6, NEMA Index Report, does not represent Current A-line Sales in California



- Index report was designed to show the nationwide transition away from standard incandescent lamps since 2012-14 regulations by NEMA members.
- Index report not limited to regulated GSL: also shows low wattage incandescent lamps that are not regulated GSL.
- Index report only tracks reporting NEMA member sales.
- Because many LED lamps are sold by non-NEMA companies and fewer halogen/incandescent lamps are sold by non-NEMA companies, chart underestimates LED lamp penetration.
- Chart is under review by NEMA to provide more accurate indication of LED market penetration based on newly available LED data.
- The halogen lamps made in 2018, and represented by Blue in this chart, cannot be sold in California today.

Other Data used in the analysis is inaccurate.

- **CEC needs updated and more accurate data before making decisions.**
  - Staff Report Data overstates stock of inefficient lamps, underestimates current and future LED penetration, and greatly over-estimates potential energy savings.
  - Table 3-1
    - The numbers in Table 3.1 for Reflector, Decorative, and Globe appear to represent **All** Technologies in 2020, not just incandescent and halogen technologies.
    - EISA 5 Exempt Incandescent lamps appear overstated by factor of 3 based on latest DOE Data Collection and Comparison with Forecasted Unit Sales of 5 incandescent Types, 2017 data.
      - Using DOE data, estimate would be closer to 10 Million sockets vs. 35 Million in California.
      - EISA 5 use expected to decrease significantly with elimination of most Vibration Service and Rough Service lamps in 2018.
  - NEMA's initial calculations produce unit values that are much lower based on lamp shipments. The 260 million unit CA projection for installed low efficiency lamps is high by a factor of 2 or 3. NEMA will address in more detail with written comments.

Table 3-2 is titled 2015 Data, but purports it to represent Estimated Stock Share by Technology in 2020!

- **Does CEC expect 2015 data to represent the market in 2020?**
- The 3-2 Table estimated stock share in 2015/2020 represents that:
  - Large Diameter Reflector (R and PAR) Lamps is 17% CFL and 1% LED.
    - CFL reflector technology will be almost completely replaced by LED reflector technology in 2020!
  - Decorative Lamps are estimated to be only 4% CFL and 0% LED
  - Globe Lamps are estimated to be 0% CFL and 0% LED.
  - This is an extreme underestimation on LED technology penetration in 2020!
  - EISA Exempt incandescent lamps, by definition are 0% LED or 0% CFL, but absolute units are expected to decline on average over 10% a year between 2015 and 2020.
- In Contrast to CA data, penetration of LED technology of Reflector lamps and Decorative lamps is estimated to be 20% to 30% today, and is likely higher in California due to aggressive rebate programs. By 2020, LED socket penetration is expected to approach 50%.
- Recent ENERGY STAR DATA shows that 381 million ENERGY STAR LED lamps (All types) were sold in 2017 representing 70% of the LED market. Total LED lamp sales would calculate at 544 million units in 2017 nationwide. The market is transforming rapidly without regulation. GS LED Shipments already exceed GSIL shipments.

The Proposed **sales ban** is highly problematic for manufacturers, retailers, distributors, and the Commission.

- Manufacturers have no control over products already shipped into the California market.
- Retailers and Distributors may be stranded with millions of dollars of unsellable inventory and the Commission must try to enforce a sales ban at a store level.
- The commission will have to develop a mechanism to simultaneously enforce thousands of potential sales points for the regulation to be fair to all. **Can CEC possibly do this?**
  - If the commission can not realistically regulate thousands of sales points at one instant in time, the regulation would be impossible to enforce.
  - The Commission needs to propose a regulation with a plausible chance of enforcement.

Color Issues with Current California Regulations and expansion of this rule.

Modified Spectrum

Soft White
2700K
80 CRI

Daylight
5000K
80 CRI

2700K
90 CRI

5000K
90 CRI

2850K
90 CRI

- 5 Basic LED color options are available in the United States
  - California only allows two of these color options to be sold
  - The three color requirements A) i, ii, and iii should not be applied to any expanded scope.
  - The current requirement should be changed to allow “Modified Spectrum” LED lamps to be sold.
    - They Operate at the Same efficiency and have the most preferred color quality of any LED lamp.
    - Suggested Change – (i) A color point that meets the requirements of in Table B1 of Annex

DOE Definition Issues Raised in RFI comments (1)

- Actual Sales of incandescent lamps were much smaller than originally estimated by DOE in 2016.
  - At the time of the Definition proposal, DOE took a position that they were unable to collect new incandescent data, so they were projecting the market with old data leading to incorrect conclusions.
  - In reality, sales in almost all incandescent categories have decreased significantly and continue to decline.
- This proposal covers several types of specialty incandescent products that have no technically or economically feasible LED replacement.
  - Often what seems possible to the outside world, is not possible due to some unforeseen technical problem that occurs in development, or lack of market size to support investments in new technology.
  - If an LED replacement lamp product is not on the market, it can not be assumed that is can or will be made.

Examples of negative market consequences when regulations passed without any replacement product available.

- CA is currently missing many types of Small Diameter LED Replacement lamps due to an unnecessarily high efficiency requirement (80 LPW).

Lamp Type	# CA CEC Types Listed	# CA Manu.	# ENERGY STAR Units	# ENERGY STAR Manu.	Percent
MR16[1]	~100	13	~400	>60	25%
PAR16[2]	~55	13	~600	>80	9%
PAR20	~30	8	~400	>90	7.5%

- 1 - CA LED MR16 Models have a lower light output range than original Halogen MR16
  - Halogen MR16 Lumens: 225 - 1200 Halogen CBCP: 450 - 14,000
  - LED CEC MR16 Lumens: 205 - 772 LED CA CBCP: 267 - 7,999
- 2 - Halogen PAR16 Lumens **650 – 900** vs. CA LED PAR16 lumens – **243-690** lumens.
- MR11 – CA offers only 4 types from one manufacturer.
- R14 & R16 – No CA LED products available today.

Conclusion: Efficiency level for small diameter lamps needs to be adjusted lower.

DOE Definition Issues Raised in RFI comments (2)

- Scope is too broad and covers many specialty lamp types that have no technical LED replacement. Edits as follows:
- General service lamp means a lamp that has a medium screw base ~~an ANSI base~~; is able to operate ~~at a voltage of 12 volts or 24 volts,~~ at or between 100 to 130 volts, ~~at or between 220 to 240 volts, or of 277 volts for integrated lamps (as defined in this section), or is able to operate at any voltage for non-integrated lamps (as defined in this section);~~ has an initial lumen output of greater than or equal to 310 lumens (or 232 lumens for modified spectrum general service incandescent lamps) and less than or equal to ~~3,300~~ 2600 lumens; has an omnidirectional light distribution, is not a light fixture; is not an LED downlight retrofit kit; and is used in general lighting applications. (Include all exclusions.)
  - Base and Voltage Changes– A general service lamp has a medium screw base and operates at 120 volts. Many specialty bases and voltages have no LED alternative and may never have an LED alternative. Each non-medium screw base or non-120 volt lamp added must be evaluated separately before adding to definition.
  - Per EISA, a general service lamp does not include directional lamps.
  - Limit to 2600 lumens because high Lumen LED lamps are not readily available at this time.

DOE Definition Issues Raised in RFI comments (3)

- Other issues with Definition:
- Add Pin-Based CFLs to exclusions –
  - Market is small and declining – down by over 20% in past 5 years
  - All pin-based CFLs operate over 45 LPW and over 1000 hours
  - Products have already maximized technical efficiency capability
  - Registering and testing products to new DOE test methods is **extremely expensive for manufacturers** for no public or energy benefit.
- **The definition contains an odd exclusion using non-standardized nomenclature for: J, JC, JCD, JCS, JCV, JCX, JD, JS, and JT shape lamps that do not have ANSI or Edison Screw bases.**
  - The Letters used are not standardized lamp shapes in the industry and do not exist in any USA industry standard for lamp shapes. While some (foreign) manufacturers use these letters to describe specialty halogen lamp types, other manufacturers use different naming conventions. For consistency in interpretation, CEC should not use non-standardized nomenclature. CEC needs to describe each base types, technology, lamp shape (using conventional ANSI standards), and voltages excluded from the definition that this exclusion is meant to represent.

Implications of August 2017 DOE Request for Information

- DOE mentioned in its August 2017 Request-For-Information that DOE might reconsider the January 2017 definition of GSL and GSIL that the CEC now proposes to mirror.
- It is Sensible to suggest that the CEC effort to mirror the January 2017 definition should await DOE's evaluation and not rush forward with this proposed rule until the federal definition of General Service Lamp is settled.
- If there is a change at the federal level, the entire CEC analysis will have to be redone even more extensively that what is being requested today.

Summary

- Data is inaccurate and leads to overstated energy savings assumptions.
- Regulation implementation needs to be a **Manufacturing Date** NOT a **Sales Ban** date.
- Current Color requirements needs to be updated and modified.
- The Definition needs to be scaled back to cover only products where a known LED lamp option is available.
- Pin-Based CFLs should be excluded from a definition expansion.
- Current Small Diameter efficiency regulations are too high.
- Proposed definition is highly problematic and may have to be changed as a result of federal action.