National Electrical Manufacturers Association

The Association of Electrical Equipment and
Medical Imaging Manufacturers
www.nema.org

October 16, 2017

Ms. Lucy deButts
U.S. Department of Energy
Buildings Technologies Program
Mail Stop EE-2J
1000 Independence Ave, SW
Washington, DC 20585-0121

RE: National Electrical Manufacturers Association Comments on Energy Conservation Program: General Service Incandescent Lamps and Other Incandescent Lamps (includes Confidential Business Information)
Notice of Data Availability (NODA) and Request for Information
Docket Number: EERE-2017-BT-NOA-0052

Dear Ms. deButts:

As the leading trade association representing the manufacturers of electrical and medical imaging product manufacturers, the National Electrical Manufacturers Association (NEMA) provides the attached comments on the Department of Energy's Notice of Data Availability and Request for Information for General Service Incandescent Lamps and Other Incandescent Lamps. These comments are submitted on behalf of NEMA Light Source Section member companies.

NEMA, founded in 1926 and headquartered in Arlington, Virginia, represents nearly 400 electrical and medical imaging manufacturers. Our combined industries account for more than 350,000 American jobs and more than 7,000 facilities across the U.S. Domestic production exceeds $117 billion per year.

Please find our detailed comments and responses to the Department's RFI attached. If there are further questions about any of the responses or data we have provided, we are available to answer your questions.

NEMA's Comments include **Confidential Business Information**, which we designate pursuant to 10 C.F.R. §1004.11. Accordingly, two copies are provided to the Department: one designated a Public Version with Confidential Business Information redacted; and one designate a Non-Public Version with the Confidential Business Information highlighted for attention. The redacted Confidential Business Information is a trade secret of NEMA and its members who participate in NEMA's statistical information program for lamps. This information is received, aggregated, and maintained in confidence, and the success of NEMA's data program depends upon the data being unique and maintained in confidence. The information is not publicly available, and it is not available from other sources. To our knowledge, the underlying data is not available to anyone else. We also designate other information confidential that would enable a reader to determine the confidential business information. There are other entities who make estimates of lamp shipments from time to time for a fee, and who do not have access to the underlying data. Disclosure would harm NEMA's interests and would undermine NEMA's ability to collect the information from the companies. Disclosure would also impair NEMA's ability to provide information to the government when requested as NEMA would be less willing to do so. This information should be maintained confidential for at least ten (10) years. The Department should treat the Confidential Business Information as exempt from disclosure.

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

Kyle Pitsor
Vice-President Government Relations

Attachment

PUBLIC VERSION WITH CONFIDENTIAL BUSINESS INFORMATION REDACTED PURSUANT TO 10 CFR 1004.11

COMMENTS OF THE NATIONAL ELECTRICAL MANUFACTURERS ASSOCIATION (NEMA)

NEMA is pleased to submit these Comments in response to the Department of Energy's (DOE) Notice of Data Availability (NODA) published in the Federal Register on August 15, 2017. 82 FR 38613 (Aug. 15, 2017). There are two parts to our Comments. In Part One, we respond to the NODA; in Part Two, we discuss the statutory framework applicable to this rulemaking and how the responses to the NODA apply to that framework.

PART ONE

NEMA makes it best efforts within the time allowed to comment on data published in the NODA and to provide alternate data where possible for the general service and specialty incandescent lamps identified in the NODA. We are not able to provide data with respect to some very granular data requests of the NODA, see 82 FR at 38616 (Aug. 15, 2017), because, for example, sales data is not conveniently maintained or collectible by lumen output or voltage for incandescent lamps within the time frame. Notwithstanding those limitations, we endeavor to provide general comments or observations where information is available to us from our member companies, including citation to comments or data NEMA previously provided in this rulemaking. In Appendix A to these comments, we include, pursuant to 10 C.F.R. §1004.11, confidential and proprietary data available only to NEMA and NEMA members who participate in the collection of lamp shipment data to help the DOE assess the reasonableness of our estimates, and request that this data be treated confidentially and exempt from disclosure. That confidential information is provided to the DOE in Appendix A as well as this Part One.

GENERAL SERVICE (A-LINE) LAMP TRENDS

SUMMARY: Shipments of general service incandescent lamps (GSIL) have declined substantially since 2011, even more so than DOE reports in the NODA. In the broader class of general service lamps, which includes GSIL, shipments have likewise declined significantly since 2011. This very substantial decline is the consequence of longer life lamps occupying medium screw base lamp sockets resulting in fewer replacement lamp sales to household consumers. At a given point in time, there are now fewer contested general service lamp sockets for replacement general service lamps than there were in 2011.[1] Sales of general service lamps --- all technologies --- have declined by 40% from 2011 to 2016, led by a 56% decline in shorter-life GSIL and a 63% decline in compact fluorescent lamps. At the same time, sales of general service (A-line) LED lamps, with an even longer rated lamp life, have surged.

General service incandescent lamps were the predominant type of light bulb sold in the United States for consumer household use with annual sales of approximately 1.8 billion units per year in 2000. By 2016, that figure had declined 80%. With the introduction of compact fluorescent lamp (CFL) technology in the 1990s, the first close substitute for the general service incandescent lamp was

[1] This is significant because replacement lamps sales (for existing general service lamp sockets) have been historically estimated by NEMA members to be approximately 95-97% of all general service lamp sales, and the remainder is accounted for by sales for new sockets.

introduced into the market.[2] Although introduced into the market in the 1990s, low cost CFL lamps acceptable to consumers did not appear on the market until after 2000. Now, with the introduction of light-emitting diode (LED) technology during this decade, the general service (A-line) LED lamp is the other substitute for the general service incandescent lamp.[3] In stark contrast to the CFL, the general service (A-line) LED lamp has achieved broad consumer acceptance in a very short period of time and is expected to become the leading type of general service lamp sold in the United States only five to six years after it was introduced in consumer distribution channels.

Together, the above-mentioned lamps are the general service lamps specifically identified by Congress in the Energy Policy and Conservation Act, 42 U.S.C. §6291(30)(BB)(i)(I-III).

1. Attributes of General Service (A-line) Lamps

The common attributes of the foregoing general service lamps are:

(a) they provide omnidirectional lighting,

(b) they serve consumer light output needs broadly *across a lumen output range* from 310-2600 lumens,

(c) they have a medium screw base (or a required substitute for medium screw base);

(d) they are household lamps and serve domestic residential voltages from 110-130 volts; and

(e) while the "bare" spiral CFL is the exception, these lamps also possess a common bulb shape of certain dimensions known as A-17 or A-19. The letter "A" stands for "arbitrary," but it is the well-recognized "pear" shape lamp bulb.[4]

General service lamps are primarily used in table lamps, floor lamps, ceiling pendant and wall fixture applications, garage and entranceway fixtures, and certain types of fixtures where the fixture accommodates the size of the A-17 and A-19 bulb shape and omnidirectional lighting is desired.

2. Shipments of General Service (A-line) Lamps

Sales of general service incandescent lamps have been declining for years, and that decline has accelerated in recent years.

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[2] Not surprisingly, in 1992, Congress defined the medium base compact fluorescent lamp as a "direct replacement for a general service incandescent lamp." 42 U.S.C. §6291(30)(S)(i).

[3] Congress has explicitly identified each of these three lamp types as a "general service lamp". 42 U.S.C. §6291(30)(BB)(i)(I-III).

[4] DOE recognizes this as a prominent feature of the "standard incandescent lamp." See https://energy.gov/energysaver/incandescent-lighting Congress has defined the general service incandescent lamp as the "standard incandescent or halogen lamp type." 42 U.S.C. §6291(30)(D)(i).

A. Sales of the traditional general service incandescent lamps[5] (lumen range 310 lm – 2600 lm) declined to virtually zero after 2014 as would be expected by the implementation of EISA-2007 energy conservation standards.[6] By 2015, there were virtually no traditional general service incandescent lamps being shipped and retail inventories dwindled toward a very small number.[7]

B. Following the implementation of EISA-2007 in 2012 through January 1, 2014, the traditional general service incandescent lamp was initially replaced in sockets by halogen incandescent lamps and medium base compact fluorescent lamps (MBCFL). The penetration of medium base compact fluorescent lamps into medium screw base sockets both prior to and during this period was significant. As previous NEMA comments in this rulemaking revealed, MBCFL shipments surged in 2007 over previous years and, except for a recessionary period in 2009, US shipments of MBCFL remained above 300 million units per year through 2014.[8]

C. The significance of these MBCFL shipments is not merely reflected in the number of annual units, but *more importantly* in the fact that MBCFL have a rated lamp life of approximately 6000 – 12,000 hours (approximately 8.6 years – 17.2 years rated life).[9] This contrasts with a rated lamp life for incandescent lamps that is considerably shorter for 1000 hour and 2000 hour rated incandescent lamps respectively. The vast majority

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[5] By general service incandescent lamp, we mean a GSIL as defined in EPCA.

[6] Pub.L 110-140, 121 STAT. 1492, 1577 (EISA 2007).

[7] NEMA Lamp Indices, https://www.nema.org/Intelligence/Pages/Lamp-Indices.aspx. By 2015,the lamps reported as "incandescent" in the NEMA Lamp Indices were low wattage (15W, 25W) lamps, with lumen output below the lumen range (310 lm – 2600lm) for what is defined as a general service incandescent lamp. *These are not GSIL*.

[8] NEMA Comments at 60 (May 16, 2016). EERE-2013-BT-STD-0051-0066 (displaying imports for domestic consumption of MBCFL from 1996-2015). NEMA regards this figure as a reasonable representative estimate for domestic sales of MBCFL during the time period).

[9] U.S. DOE, *2014 Adoption of Light-Emitting Diodes in Common Lighting Applications* at 46, 49 (July 2015) reported the CFL residential average operating hours at 1.9 hours per day (or 693 hours per year): a 6000 hour rated MBCFL would have an average life of 8.65 years based on these figures. Using a 6000 hour rated life is a conservative rating for purposes of this discussion. Many CFLs sold were covered by the ENERGY STAR program, and the ENERGY STAR specification for CFLs effective in 2008 required an 8000 hour rated life. See https://www.energystar.gov/ia/partners/product_specs/program_reqs/cfls_prog_req_4.0.pdf?d983-04ca (Version 4.0, March 7, 2008). At 8000 hours rated life, the average life of the CFL would be 11.54 years. Energy Star version 1.0 for Lamps (August 2013) requires a minimum 10,000 hour rated life for CFL. The DOE report also noted there were MBCFL rated at 12,000 hours. *2014 Adoption of Light-Emitting Diodes in Common Lighting Applications* at 14 (July 2015). At 12,000 hours, the average life of a CFL would be 17.2 years.

of halogen incandescent lamps sold have a rated life of 1000 hours (approximately 1.8 years on average life).[10]

D. A 1000 hour rated general service halogen incandescent lamp installed in 2012 would be replaced, on average, in 2013 or 2014. A conservatively rated 6000 hour rated MBCFL installed in 2012 would not be replaced, on average, until 2020.[11] Two conclusions flow from this fact: (1) when annual MBCFL shipments increased to over 300 million per year from 2007 onward from approximately 100 million in 2004 and 2005, those increased shipments largely (although not entirely) represented new socket penetration for MBCFL (at the expense of GSIL) rather than MBCFL replacement socket penetration; (2) the longer-life of an MBCFL in a socket and less frequent replacement of light bulbs crowds out the ability of the GSIL to replace the MBCFL while the MBCFL remains in the socket. This impacts general service incandescent replacement lamp shipments.

E. Using a 9-year period as a representative proxy for average MBCFL life, US import data show for the nine year period from 2007 – 2015, 2.94 billion MBCFL imported for domestic consumption, their rated life would suggest they reach end of life in 2016 – to 2024. In the preceding 7-year period from 2000 – 2006, approximately 586 million MBCFLs are shipped.[12] The difference of roughly 2.4 billion MBCFL represents a fair proxy representation[13] for the extent of increased MBCFL socket penetration in general service lamp medium screw base sockets. The difference would indicate that 2.4 billion

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[10] U.S. DOE, *2014 Adoption of Light-Emitting Diodes in Common Lighting Applications* (July 2015) reported the halogen incandescent residential operating hours at 1.5 hours per day (or 547 hours per year): a 1000 hour rated halogen lamp would have an average life of 1.8 years based on these figures. A 2000 hour rated halogen lamp would have an average lamp life of 3.65 years based on these figures.

[11] NEMA does not intend to understate the difficulty of making a general observation about lamp life, lamp replacement, and the incumbency of lamps in sockets. For example, lighting controls (dimmers) that reduce wattage use and light output will extend lamp life. And there are other reasons why a lamp may be replaced before end of life besides lamp failure. Frequent switching – on and off --- of a CFL can reduce fluorescent lamp life. By necessity, we are dealing with observations and data about averages and medians and address probabilities, magnitude, and trends rather than certainties. And as the previous footnote highlights, rated lamp life increased over time for both Energy Star qualifying and non-Energy Star qualifying CFL, making it difficult to standardize on a rated life assumption over time.

[12] NEMA has selected a 7-year period on purpose for period comparison because MBCFL lamp life improved over the course of time, and we know that average lamp life was shorter in the period preceding period 2007 than during the 9-year period that followed. See footnote 9, *supra*. Adding two more years to the preceding period does not change the metric much as MBCFL sales were relatively lower in those two years.

[13] It should be acknowledged that there is a "pantry effect". Lamps sold in packages of four or more likely do not always translate into an immediate installed operating lamp for every lamp in the package, but some may remain stored in a package until another lamp expires later. Hence we refer to a "fair proxy representation" in terms of magnitude and direction. See also note 11, *supra*.

MBCFL were not used to replace prior installations of MBCFL, but were installed in new sockets or replaced general service incandescent lamps in existing sockets. Our earlier comments in this rulemaking noted that a July 2015 DOE report, *Adoption of Light-emitting Diodes in Common Lighting Applications* at 15, CFL socket penetration is estimated to have increased from 34% to 46% from 2012 – 2014.[14] NEMA members believe that DOE has made a conservative estimate of MBCFL socket penetration here. During that period, MBCFL accounted for an average of 34% of A-line lamp sales, but reaching as high as 47% in the 4th quarter of 2014.[15] Because of longer MBCFL lamp life, the level of socket penetration will significantly exceed the MBCFL share of shipments of MBCFL plus general service incandescent lamps.

F. Because the three types of general service lamps have different rated lamp lifetimes, shipments of each type of general service lamp does not correlate with the extent that they are used in lamp sockets. Due to its shorter lamp life and more frequent replacement, shipments of general service incandescent lamps *overstate* the extent to which they are actually used in general service lamp sockets compared to CFLs and general service LEDs. Due to their longer lamp life and less frequent replacement, shipments of CFL and general service LEDs *understate* the extent to which those lamps are actually used in sockets.

G. Since 2015, the general service (A-line) LED lamp, with a longer rated lamp life than the MBCFL, has entered the market and is capturing sales and sockets from both the MBCFL and the general service halogen incandescent lamp. MBCFL imports for domestic consumption for 2016 fell to approximately 124 million units compared to 265 million units in 2015. Based on federal import data available through June 2017, NEMA foresees annual imports for domestic consumption of MBCFL falling to approximately 80-90 million units in 2017. Meanwhile, based on recently available federal import data available through June 2017, year-to-date shipments of general service (A-line) LED lamp shipments indicate that annual shipments of these lamps will exceed 300 million units in 2017, achieving parity with or surpassing GSIL in 2018 if not earlier in 2017.

H. In 2011, general service LED lamps were sold almost entirely into the commercial sector. The early LED product that came to market was extremely expensive, and only commercial customers who operated light bulbs for long hours each day or week might expect to see anything close to a return on investment for the high-priced LED lamp.

[14] NEMA Comments at 59 (May 16, 2016). EERE-2013-BT-STD-0051-0066.

[15] NEMA Lamp Indices http://www.nema.org/Intelligence/Pages/Lamp-Indices.aspx (accessed September 22, 2017). **Recall that the NEMA Lamp Index includes A-line incandescent lamps with a lumen output below 310 lumens (15 W, 25W), so the reported share of MBCFL in this index would be higher if these non-general service lamps were excluded from the denominator.**

General service LED lamp shipments into the consumer retail channel initially picked up in 2014, and it was not until 2015 and 2016 that general service LED lamp fallen to a price point that consumers found acceptable. The data demonstrates that consumers have started buying general service LED lamps in significant numbers since 2015 and their purchases continue to grow. It is clear that the LED lamp, with its explosive growth in just three years, has not experienced the same market entry problem that the CFL experienced over a 17 year period.

I. The NODA describes data showing that by 2015 general service incandescent lamp shipments had fallen to 60% of 2011 shipment levels. NEMA agrees that there has been a downward trend in GSIL shipments after 2011, but the decline has actually been far more severe than the data in the NODA describes. NEMA data collected from manufacturers of GSIL shows that by 2016, GSIL shipments had fallen to 44% of 2011 shipment levels. See Appendix A. NEMA is not privy to the modeling DOE used to estimate the figures in the NODA, but the model is not tracking the depth of the actual decline in GSIL shipments since 2011. NEMA surmises that the reason for the difference is that the DOE's model is not accurately reflecting the impact of longer life MBCFL and LED in general service lamp sockets described in the preceding paragraphs. While LED's are sold in a range of rated lamp life (8000 – 22,000 hours), the Energy Star specification for these lamps requires the general service LED lamp to have a rated life of 15,000 hours (50% higher than the CFL).

We compare in Table 1 the DOE's estimate of shipments of GSIL in the NODA with NEMA member estimates based on NEMA collected data and supplemented by other sources of information including U.S. government data of imports for domestic consumption. See Appendix A, *infra*.

TABLE 1

Estimated General Service Incandescent Lamp Shipments in Millions of units							
		2011	2012	2013	2014	2015	2016
GSIL	NEMA estimate	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
GSIL	NODA estimate	737	634	626	499	441	N/A
Index NEMA	2011=100	100	84	80	58	45	44
Index NODA	2011=100	100	86	85	68	60	N/A

With the consumer-driven residential lighting market transforming itself from GSIL and CFL to general service (A-line) LED lamps, total aggregate shipments of these three types of general service lamps have declined considerably as shown in Table 2 below. As estimated by NEMA members, total domestic shipments of general service lamps in 2016 were 64% of 2011 levels. This trend is expected to continue, and it is a function of longer life lamps resident in general service lamp sockets. Based on first-half 2017 data, a forecast estimate for 2017 suggests that general service LED shipments may exceed

GSIL shipments as early as 2017. This would be consistent with what consumers are seeing on retail store shelves.

TABLE 2

Estimated General Service Lamp Shipments in Millions of units							
	2011	2012	2013	2014	2015	2016	2017F*
GSIL	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
CFL	318	332	328	339	271	126	84
LED	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	330
GSL	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
Index 2011=100	100	89	87	74	67	64	[redacted]

*2017 (12 mos.) estimate is derived from first six month shipment members for January – June 2017 from the same sources and methods of estimating annual shipments 2011-2016.

In the NODA, DOE requested, "[F]or categories for which sales are decreasing, DOE requests information regarding what products consumers are purchasing as replacements. As DOE believes the demand for light is not significantly decreasing, DOE expects a decrease in sales for incandescent/halogen products to represent a shift in purchases to products using fluorescent and/or LED technology." 82 FR at 38616 (Aug. 15, 2017). In response to DOE's request, NEMA has three comments:

- Sales for GSIL and MBCFL are both decreasing as are sales for general service lamps in the aggregate. Sales of GSIL have decreased every year since 2011 for two reasons: (1) in the years prior to and immediately following 2011, consumers substituted MBCFL for GSIL in large numbers, and (2) there are fewer medium screw base sockets for the GSIL to occupy because of the growing occupancy of longer-life MBCFL in those medium screw base sockets. Over the past two years, consumer substitution of the general service (A-line) LED for the MBCFL and the GSIL has been brisk, and manufacturers have begun disinvesting in CFL supply. Consumers are replacing GSIL and MBCFL with general service (A-line) LED, and consequently the number of general service lamp sockets available for replacement in any given year continues to shrink further. See also NEMA Comments at 60-61 (May 16, 2016). EERE-2013-BT-STD-0051-0066. The data demonstrates that, unlike the experience of the CFL, the general service LED is rapidly approaching parity with the GSIL, and will likely soon surpass the GSIL according to recent shipment data.

- As discussed below, consumers do not typically switch or substitute specialty incandescent, fluorescent, or LED lamps for GSIL or MBCFL as specialty lamps are <u>not</u> demonstrating any growth in sales that would suggest such substitution is occurring at the expense of GSL. That would be a very rare phenomenon. Additionally, there are multiple reasons why consumers

would not make that kind of substitution as further explained in these Comments. Consumers typically substitute specialty lamps for specialty lamps in the same specialty lamp type category. When consumers are looking for a replacement lamp for an incumbent lamp, they are looking for a replacement lamp that has the same physical (size of bulb and lamp base), electrical (voltage) and photometric (lumen output, color) properties as the lamp they are replacing. The consumer's decision-making relative to the physical and photometric properties of a lamp is driven by both practical (does it fit? does it provide the right amount of light needed?) and aesthetic considerations (does it look right?). For a consumer to switch out of category from a general service to a specialty lamp almost always involves a much more expensive proposition than the substitution of a light bulb within the same category. Such a change would likely occur in connection with a home or room renovation, but that is a different decision-making calculus for the consumer: a consumer does not renovate to switch lightbulbs; a consumer *might* change the type of lighting (s)he uses when renovating. If that occurs and the consumer uses specialty lighting after the renovation, the consumer would have decided that it no longer needs or wants a lighting application served by a general service lamp.

- DOE's statement that the demand for light is not significantly decreasing mistakenly confuses the demand for light and the demand for a light bulb. These are two very different things. Consumers can demand the same or a growing amount of light from their installed light bulbs or from a growth in housing stock that is accretive to the number of lamp sockets, but the longer life lamps in sockets that require less frequent replacement of general service light bulbs reduces the demand for light bulbs notwithstanding the fact that the demand for light is not falling. To summarize, the demand for general service lamps is shrinking because of a continuously growing number of longer life lamps in general service lamp sockets. Consequently, 470 million fewer GSIL sold in 2016 than 2011 does not correspond to 470 million more MBCFL, general service (A-line) LED or other lamps taking their place in sockets during the same period. In the period of time since 2007, consumers switched from general service incandescent lamps to longer life MBCFL in a very substantial way, and since 2015 consumers are switching from GSIL and MBCFL to even longer life general service LED in a very substantial way.

3. *Special data issues*

NEMA does not collect or maintain lamp data specific to voltage designs for general service incandescent, compact fluorescent, or general service (A-line) LED lamps. There are no low voltage general service incandescent lamps to NEMA's knowledge (but compare discussion of low voltage lamps, *infra* at pages 14-17). The 220V/240V incandescent lamps, to the extent offered for sale by domestic lamp manufacturers, are offered almost entirely for sale in Europe and not the United States. There are a limited number of specialty 240V high wattage/high lumens double ended quartz halogen lamps sold for commercial/industrial applications in the United States, particularly for outdoor flood

lighting, stage and studio lighting.[16] This is not a consumer lamp. General service incandescent lamps are defined by Congress as "capable of being operated at a voltage range at least partially within 110 and 130 volts," and this definition would preclude including lower and higher voltage lamps beyond the voltage range in this definition even if such lamps existed. It is reasonable to conclude that in the United States all general service lamps operate in the voltage range 110-130 volts. As discussed *infra* at page 25 in the discussion of certain specialty lamps, NEMA does collect data on low voltage pin-base multi-faceted reflector (MR) lamps, which are used primarily in commercial applications.

NEMA also does not collect lamp data by wattage or lumen level. Previously, NEMA did survey its members earlier in this rulemaking to determine the percentage allocation of sales of different types of lamps in specific lumen/wattage bins for those lamps. See NEMA Comments at 97-98 (May 16, 2016). EERE-2013-BT-STD-0051-0066. The results of that survey are found *id.* in the tables following page 101 under the column titled "Percent Lamp Type." The survey noted slight differences in allocation among wattage/lumen bins between GSIL and CFL and LED, primarily attributable to incentive programs for CFL and LED lamps.

SPECIALTY INCANDESCENT LAMP TRENDS

SUMMARY: Sales of types of specialty incandescent lamps are declining or static. *The demand for these lamps is separate and distinct from the demand for GSIL and other types of general service lamps such as MBCFL or general service (A-line) LED lamps because they are used in different sockets and applications than where GSIL are used, and there are significant switching costs in most cases over and above the cost of purchasing a replacement light bulb.* There is a significant discrepancy between the industry's shipment data and the shipment data reported by DOE in the NODA. DOE has significantly overstated shipments of incandescent reflector lamps, other specialty reflector lamps, candelabra base lamps and other decorative lamps. The NODA data does not capture the decline in specialty incandescent lamp shipments that the lighting industry is actually experiencing.

1. Attributes of specialty lamps

Specialty lamps serve lighting applications different than the lighting applications served by general service incandescent lamps, MBCFL, or general service (A-line) LED lamps. Specialty lamps have attributes comprised of one or more of the following: (1) some provide directional lighting with a narrow beam angle in contrast to omnidirectional lighting provided by the general service incandescent lamp and its close substitutes; (2) many have a limited lumen output that does not generally serve the broad range of lumen outputs (310 lm – 2600 lm) of general service incandescent lamps and close substitutes; (3) most have a different bulb shape consistent with special applications that require a different form factor where general service incandescent and other A-line lamps are not used; (4) a voltage design almost exclusively found in non-residential applications; (5) a different lamp base than the medium screw base lamp applications traditionally served by general service incandescent lamps or their close substitutes. They also tend to cost more than general service lamps of the same technology.

[16] See e.g., https://www.satco.com/s3185.html

A. *Smaller lamp bases.* It is axiomatic that lamps with smaller screw bases (e.g. E12 candelabra base or E17 intermediate base) than the medium screw base (E26) do not compete for the same socket and opportunities for consumer switching are impaired by that fact. The sale of adapters that would enable the use of a lamp with a smaller screw base in a socket with a medium screw base were banned by EISA-2007, 42 U.S.C. §6302(6).[17] Even without that ban, however, consumers have very little interest in substituting a candelabra base lamp for a general service incandescent lamp because the shape of the bulb used with the smaller base lamps is different and looks, to the consumer, inappropriate for the application, and those smaller lamps typically have limited lumen output compared to the general service incandescent lamp. Furthermore, most specialty lamps with the smaller screw base have higher consumer acquisition costs than the general service incandescent lamp. Incandescent lamps with small screw bases (E12, E17) typically sell for more than a 1000 hour general service halogen incandescent lamp. For the consumer to switch from a general service incandescent lamp with its medium screw base to a lamp with a smaller candelabra base requires the consumer to completely change the light fixture that will receive the lamp and/or hire an electrician to install the different light fixture. These significant switching costs deter consumer switching from a general service incandescent lamp to a lamp with a small screw base for the same application.

Tables 3 - 5 below contrast the attributes of smaller candelabra base (E12) and intermediate base (E17) incandescent lamp with the general service incandescent lamp with a medium base (E26):

TABLE 3
CANDELABRA BASE DECORATIVE SPECIALTY INCANDESCENT LAMP

Wattage range	Lumen range	Voltage	Bulb shape	Life rating	Consumer acquisition cost[18]
15W-60W	160-580	110-130V	B,BA,C,CA,F	1500-3000 hrs	$1.10-$2.25 unit
25W-60W	190-530	110-130V	G16-1/2	1500 hrs	$1.10-$2.25 unit
Primary application		Decorative candelabra fixtures, wall sconces, fixtures with small amount of space for lamp			

[17] Should be 42 U.S.C. §6302(7).

[18] The data presented in these tables, including consumer acquisition costs, represents a survey of retail and online websites conducted in August 2017. No representation is made that these tables are complete, but NEMA members submit they are broadly representative. Consumer acquisition cost for lamps necessarily shows a range and the differences in prices can reflect differences in lamp life, whether a lamp is or is not dimmable, the retail store or online site on which it is sold and other factors. It may be possible to find a lamp sold at a particular store or website above or below the range shown, but the cost range shown in each case is believed to be reasonably representative of most offers.

TABLE 4
INTERMEDIATE BASE SPECIALTY INCANDESCENT LAMP

Wattage range	Lumen range	Voltage	Bulb shape	Life rating	Consumer acquisition cost
10W - 40W	80 - 440	110-130V	S11	550-2500 hrs	$2.00-$4.00 unit
15W - 40W	90 - 420	110-130V	T6, T7, T8,	1000-2500 hrs	$1.50- $8.00 unit
40W	350-440	110-130V	A15	1000-2500 hrs	$2.50-$4.00 unit
25W-40W	150-250	110-130V	R14, R16	1500 hrs	$4.50-$5.00 unit
Primary application		Signs (S11, T6,T7,T8), appliances (T8, A15), furniture display (S11,A15,R14,R16,T8), germicidal (T7), ceiling fans (A15) fixtures with small amount of space for lamp			

TABLE 5
MEDIUM BASE GENERAL SERVICE HALOGEN INCANDESCENT LAMP (A-Line, GSIL)

Wattage range	Lumen range	Voltage	Bulb shape	Life rating	Consumer acquisition cost
29W-72W	400-1600	110-130V	A17, A19	1000/2000 hrs	$1.25 (1000 hr)-$2.50 (2000 hr) unit
Primary application		Household medium screw base fixture, table lamp, desk lamps.			

Tables 3 - 5 reveal that in terms of lumen and wattage range, bulb shape, and life rating, the specialty lamps with smaller lamp base are very different than the general service incandescent lamp *in almost every respect*. They are also entirely different in their applications, and consequently the specialty incandescent lamps cannot be lamps that are used to serve lighting applications traditionally served by general service incandescent lamps. Even between candelabra base and intermediate base lamps the other attributes of the lamps are very different and have very different applications. These differences in the physical and performance attributes of the smaller base lamps are directly tied to the fact that consumers do not use smaller base lamps in applications traditionally served by general service incandescent lamps. The only thing these lamps have in common is that they emit light and they all operate at 110-130 volts. Not all of them are used in households: sign lamps (S11, T6, T7, and T8) and germicidal lamps (T7) are not used in household applications.

B. *Limited lumen output.* As the tables above indicate, the specialty lamps with the smaller screw base possess a limited lumen range ***only*** at the very low end of the lumen range of general service incandescent lamp. In the case of the general service (A-line) lamps, these lamps fall into lumen ranges associated with a specific wattage or a wattage range. NEMA surveyed manufacturer and retail websites to identify the lumen output representations made by manufacturers with respect to their general service lamps in each of the three technologies for A-line shape lamps. It similarly surveyed the lumen output representations of the specialty light bulbs with wattage of 40 watts and the range of those representations is displayed in Table 6 below. Notably, all of the specialty light bulbs were 50-100 lumens or

more below the lumen output of the 40 watt GSL, and 100 - 1000 lumens below the lumen range of ninety percent of those general service lamps 750 – 1750 lumens. The DOE should be able to replicate these findings.

TABLE 6

Lamp	Wattage	Lumen Bin			
		310 - 749 Reported Lumens	750-1049 Reported Lumens	1050 - 1489 Reported Lumens	1490-2600 Reported Lumens
Old 40W Equiv					
Halogen	29	400-450			
CFL	9	550-600			
LED	5 to 6	450-465			
Old 60W Equiv					
Halogen	43		750-890		
CFL	13 to 15		800-900		
LED	8 - 9.5		760-800		
Old 75W Equiv					
Halogen	53			1050-1270	
CFL	18-20			1100-1250	
LED	10.5 - 12			1060-1230	
Old 100W Equiv					
Halogen	72				1490-1600
CFL	23-26				1600-1750
LED	14-16.5				1500-1650

Lumen bins reflects the lumen ranges established in EISA-2007 for the halogen incandescent lamp standards. The Reported Lumens represents the range of lumens associated with lumens reported by numerous lamp manufacturers on websites with respect to their halogen, compact fluorescent, and LED general service (A-line) lamp products.

The lumen output survey for the maximum 40 watt allowed medium base specialty lamps (B, BA, CA, F, G16.5, G25, G30, S, T6, and T10 shapes) revealed lumen ranges from 280 lumens to 440 lumens with the vast majority in the range of 320 – 380 lumens. Along a continuum of lumen output levels from dimmest to brightest, 310 – 2600 lumens, these specialty lamps can be compared with general service lamps as follows:

40W specialty lamp	40W equiv GSL	60W equiv GSL	75W equiv GSL	100W equiv GSL
320 – 380 lumens	400-600 lumens	750– 900 lumens	1050-1270 lumens	1490-1750 lumens
Dimmer	Dim	Bright	Brighter	Brightest

The observation about the limited lumen output range with respect to the smaller candelabra and intermediate base lamps applies to these same kinds of specialty lamps with a medium screw base.

TABLE 7

MEDIUM BASE DECORATIVE INCANDESCENT LAMPS

Wattage range	Lumen range	Voltage	Bulb shape	Life rating	Consumer acquisition cost
15W-40W	160-365	110-130V	B,BA,C,CA,F	1500-3000 hrs	$1.90-$3.10 unit
25W-40W	185 - 320	110-130V	G25, G30	1500 hrs	$1.10-$2.25 unit
Primary application		Decorative lighting fixtures, bathroom/dressing room vanity lights.			

TABLE 8

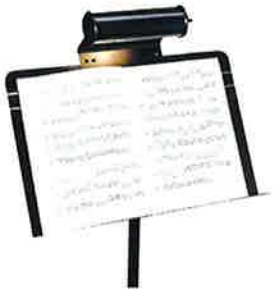
OTHER MEDIUM BASE SPECIALTY INCANDESCENT LAMPS

Wattage range	Lumen range	Voltage	Bulb shape	Life rating	Consumer acquisition cost
20W-40W	40-370	110-130V	T9, T10, T12, T14	1000-3000 hrs	$1.50-$11.00 unit
10-15W	60-200	110-130V	S14	2500 hrs	$1.50
15W-40W	90-455	110-130V	A15	1750-3000 hrs	$1.00-$2.00
40W	235-380	110-130V	R14, R16	1500-3000 hrs	$2.50-$5.50
Primary Application		Fixtures with small amount of space for lamp (T, A15, R14, R16) furniture display (T, A15), music stands (T10), sign (S14), appliance (A15), outdoor novelty lights (S14).			

The specialty lamps with limited lumen output do not serve across the wider lumen output range that consumers expect from general service lamps. That is another reason why consumers do not use lamps with a smaller form factor in applications traditionally served by general service incandescent lamps.

C. *Different, typically smaller bulb shapes*.

None of the specialty lamps described above use the A-17 or A-19 "pear shape" bulb that is used with the general service incandescent, compact fluorescent or general service LED lamp. The primary reason is because the specialty lamp applications frequently demand a bulb with a smaller form factor for which the general service incandescent lamp's A-17 or A-19 bulb is too large and will not fit because of confined space configurations, or a smaller form factor is required for aesthetic reasons. Here are some examples where bulbs with smaller form factors are designed for use in confined space configurations where a GSIL will never be used:

Music stand lamp using T-10 bulb	Refrigerator appliance lamp using small A-15 bulb	Furniture display lamp using small A-15 bulb
		

D. *Household voltage range: Low voltage (12V, 24V) lighting.*

An estimated ninety-eight percent (98%) of general service incandescent lamps are used in residential applications[19] where the mains electrical voltage in the United States for most electrical outlets and virtually all lamp sockets is generally in the range of 110-130 volts with a nominal voltage of 120 volts.[20] The general service incandescent lamp and its close substitutes are a consumer product,[21] almost entirely for household use, and the applications traditionally served by general service incandescent lamps are powered by 120V nominal voltage. While some household appliances such as electric stoves and clothing dryers are plugged into an electrical outlet with a nominal voltage of 240 volts, when lighting is a component of these 240V appliances (such as an oven or refrigerator) a transformer in the appliance steps down the voltage to a nominal voltage of 120 volts for the light bulb.

[19] DOE, *2010 Lighting Market Characterization* at 22, Table 4.1 (2012).

[20] A utility delivers electric power to a utility pole outside a residence at a nominal voltage of 240 volts. At a transformer on the utility pole, the power is divided into a split phase system, with each line having a nominal voltage of 120 volts. Nominal voltage is the voltage that the line is designed for; however, tolerance for voltage fluctuations is −5% to +5%, which leads to an actual voltage range somewhere between 114V to 126V from the outlet and a voltage range of 228V to 252V for certain "full-phase" appliances. At the transformer, the utility's single phase power is split into 3 wires: 2 line wires and a ground. Light bulbs, consumer electronics, and other 120V devices are connected between one line wire and the grounded center, while certain "full phase" 240V appliances such as electric stoves, clothing dryers, central air conditioning units, and some refrigerators are connected to both line wires and the ground.

[21] 42 U.S.C. §6292(a)(14).

In view of the foregoing, Congress defined the general service incandescent lamp in terms of its ability "of being operated at a voltage range at least partially within 110 and 130 volts." 42 U.S.C. §6291(30)(D)(i)(IV). The lighting applications traditionally served by general service incandescent lamps in the United States operate in this voltage range.

Household consumer lighting in the United States is not to any degree served by lamps operating at a nominal voltage of 240 volts. Lamps designed for use with a nominal voltage of 220 volts are European products (240 volts in the U.K.) designed for the European market. As explained earlier, there are a few specialty 240V, high wattage, high lumen specialty lamps for outdoor flood lights, stage and studio lighting sold in the United States, but these are strictly commercial/industrial lamps.

In recent years, some low voltage (12V, 24V) lighting products have come to be used in residential household applications. This is not common. Initially these low voltage lighting systems were confined to outdoor landscape applications, but recently some have found their way into indoor home applications. A transformer is required with these low voltage lighting systems to step down the higher standard line voltage to either 12 or 24 volts. The transformer may be part of the fixture (integral to the fixture) or it may be located outside the fixture (an external transformer), and without it the lamps in the circuit would be subjected to 120V and would burn out quickly. Examples where low voltage lighting systems are used include recessed lights, track lights, bendable rail lighting systems, landscape lighting, deck lighting, under cabinet lighting and display lights. The main advantage of low voltage lighting is that its low voltage allows the filament of the light bulb to be smaller, and this allows users to put lighting applications in smaller places than the general service incandescent lamp is used. Notably, however, light bulbs with bulbs having smaller form factors such as candelabra style lamps use regular line voltage, and are not low voltage lamps. 24 volt systems are very rare and, when used, are used almost exclusively in commercial applications.

NEMA is aware of no general service incandescent lamps or close substitutes designed for use with low voltage applications. Low voltage lighting applications are therefore not a "lighting application traditionally served by general service incandescent lamps." The types of small lamps designed for low voltage applications are smaller wedge base light bulbs, festoon base light bulbs, and certain bi-pin base light bulbs:

Xenon T3-1/4, Wedge base	

Xenon T3-1/4, festoon base	
Xenon T3-1/4, bi-pin base	
Halogen or LED MR8 GU4 pin base	
Halogen or LED MR11 GU5.3 pin base	
Halogen or LED MR8 GZ4 pin base	

Just by looking at the above light bulbs, one can see that these low voltage specialty lamps are not used in lighting applications traditionally served by general service incandescent lamps. A consumer will not switch a general service incandescent lamp in a medium screw base socket

supplied with 120V electrical power to one of these low voltage lamps because they will require a different fixture and a transformer, all of which add considerable switching costs to the transaction. Nor will a consumer be able to use a general service incandescent lamp or any close substitute in the lighting fixtures used by low voltage lamps.

E. Reflector or directional lamps

A fundamental attribute of the general service incandescent lamp is that it provides omnidirectional illumination with a nearly 360 degree pattern of light. That is true for its close substitute the compact fluorescent lamp, and now the general service LED (A-line) lamp.[22]

In contrast, reflector lamps are used to provide "directional" light[23] with a much narrower beam angle. Reflector lamps are typically referred to as "spot" lights, or "flood" lights. A spot light typically has a very narrow beam angle of 8-16° but no more than 20°; a flood lamp typically has a beam angle of 25-40°; a wide flood lamp typically has a beam angle 45-120°,[24] all of which are considerably narrower than the 360° pattern of a standard GSIL. Reflector lamps are frequently referred to as "downlights" because their normal installation application is a vertical downward or downward angled position. They are typically used to provide accent lighting focusing light on a specific spot in a room, or to increase light levels on a specific surface such as a kitchen countertop; however a few, primarily bulged reflector lamps, offer a wider beam angle and more diffuse light than spot lamps or other flood lamps, although not nearly as diffuse and omnidirectional as a GSIL. A directional reflector lamp would not normally be used by a consumer in a fixture where the user needs omnidirectional lighting characteristic of the standard incandescent lamp and their close substitutes specifically identified by Congress as GSLs. 82 Fed.Reg. at 7292 (January 19, 2017). While GSIL and omnidirectional lamps are known to be inserted in recessed and track fixtures designed for reflector lamps, it is not common and it is a waste of light to use omnidirectional lamps in recessed and track fixtures.

Directional lamps are traditionally used in recessed lighting fixtures and track lights. They are, by design, not capable of providing "overall illumination" due to their narrower beam width, and this is reinforced by the reflector lamp's presence in recessed ceiling fixtures which blocks the distribution of light. Reflector lamps with a wider beam angle are capable of providing broader area illumination than those with a narrower beam angle. In the photographs below on the left, an omnidirectional LED lamp in a floor lamp illuminates an area in the center of a room, a wall,

[22] Versions of the general service LED (A-line) lamps have designs with a 270-300° distribution of light.

[23] 82 Fed.Reg. at 7322 (January 19, 2017)(" Reflector lamp means a lamp that has an R, PAR, BPAR, BR, ER, MR, or similar bulb shape as defined in ANSI C78.20–2003 (incorporated by reference; see § 430.3) and ANSI C79.1–2002 (incorporated by reference; see § 430.3) and is used to provide directional light.").

[24] See generally ANSI C78.379-2006 *Classification of the Beam Patterns of Reflector Lamps* available at http://www.nema.org/Standards/SecureDocuments/C78-379.pdf

and a corner of the room; in the photographs on the right an LED reflector lamp in a recessed ceiling fixture at the same location illuminates both the wall and the corner area of the room *more dimly than* the omnidirectional lamp.[25] The directional reflector lamp in the recessed ceiling fixture does not provide the same level of uniform illumination over the same area as the omnidirectional lamp; it is directed primarily at the area below the lamp.

Illumination from single A-line LED lamp, 800 lumens, floor lamp fixture	Illumination from single downlight reflector LED, 750 lumens, recessed ceiling fixture
	
	

Reflector or directional lighting comes in a variety of shapes and sizes. The bulb shapes are referred to as PAR, R, BR, ER, MR. They come in different sizes measured by lamp diameter or the length of the "neck" of the lamp.

[25] The same point is similarly demonstrated in *A Guide to Residential Directional Lighting* at 15-16 (RPI Lighting Research Center 2007) available at http://www.lrc.rpi.edu/programs/solidstate/assist/pdf/directional1.pdf

Examples of Reflector Lamps

BR R PAR MR

PAR (Parabolic Aluminized Reflector) bulbs are considered by many to have superior photometric qualities to other reflector lamps such as R (Reflector) or BR (Bulged Reflector) due to their tight crisp beam control allowing them to produce a very focused beam of light. They are shorter than R bulbs allowing them to recess deeper into the fixture making the PAR bulb harder to see while reducing unwanted glare. On the other hand, light emitted from a PAR bulb is a bit more intense than BR and R bulbs because of the manner in which the reflective surface and lens is situated. The lens of the PAR bulb doesn't allow the light to spread much further than the angle of the beam spread, causing a sharper cutoff when it comes to where the light starts and ends. The light from a PAR lamp is more directed and less diffuse. Most PAR lamps will have a beam angle that does not exceed 45 degrees. Some PAR lamps have a very narrow beam angle, as tight as nine degrees. This type of tightly controlled beam is impossible with a general service lamp or a standard reflector lamp.

R and BR (Reflector) type bulbs on the other hand feature a bulged reflector. The sides of the outer part of the bulb are coated with a reflecting material that directs the light. They come with a frosted face that evenly diffuses the light and eliminates the glare. As shown in the photos of the room above, the light from the R bulb gradually fades as it reaches the limits of the beam spread. Its softer spread of light causes them to produce less shadow than PAR bulbs, while PAR lamps can produce more dramatic lighting effects. R and BR lamps will typically have a beam angle that exceeds 45 degrees and up to 120 degrees, and would be considered a wide flood lamp.

MR (multi-faceted reflector) bulbs are more similar in design purpose to PAR lamps than R or BR lamps, except they are very small, control a beam of light very well, and emit a bright white light. Originally designed for use with film projectors and later for commercial retail accent lighting focusing on product display, MR lamps feature a pressed glass reflector with the inside (reflecting side) surface composed of facets and covered by a reflective coating. The facets provide optical control by gathering the light from the filament to create a concentrated beam of light.[26] Only more recently have MR lamps found residential applications; however

[26] See generally, http://www.lrc.rpi.edu/programs/nlpip/lightinganswers/mr16/whatAreMR16.asp

commercial applications remain the predominant use of MR lamps. For household use, MR lamps are a much more expensive proposition. MR lamps are primarily offered with a pin-base, although a relatively small percentage of MR lamps are sold with a medium screw base. MR pin-base lamps are designed as low voltage lamps (see discussion *supra* at 15-16) while some screw-base MR lamps (MR 16 with larger diameter) are offered at nominal voltage of 120V. As was previously explained, low voltage allows the filament of the light bulb to be smaller, and this allows users to put lighting applications in smaller places than when the general service incandescent lamp is used. The beam angle of MR lamps range from 10° - 60°, although most sold fall in the range of 15°-36°. Notably, both low voltage and medium voltage MR incandescent lamps at $5.00-$7.00 per lamp are very expensive compared to the general service incandescent lamp at $1.25 per lamp (see Tables 9 and 10 below and compare Table 5, *supra*), and this enormous price differential is another reason why MR lamps are not common in consumer residential applications.

When defining MR lamps, care must be taken to separate accent lighting products from specialty MR products used in equipment. Accent lighting MR products are pin-based and operate at 12 volts (and a few less expensive versions are screw-based operating at 120 volts), but they typically produce less than 800 lumens, are less than 75 watts, and have a life of 2000-6000 hours. Most specialty MR lamps have shorter rated lamp life of less than 1000 hours, are designed to run at a wide variety of voltages, and some can produce very high wattages for a short period of time. They are usually designed for equipment that has very low annual operating hours.

The design of a reflector lamp also impacts its lumen output and lamp efficacy, and this fact renders the reflector lamp a "type" of lamp distinct from the omnidirectional general service incandescent lamp. Unlike omnidirectional lamps, where almost all of the light output from the lamp can effectively and efficiently leave the lamp to enter a room and provide lighting, a reflector lamp has to "reflect" or "bounce" the light rays in the direction of the lens. While some of the light will leave the directional lamp going in the right direction, all other light rays must be redirected to go in the same direction. Every time a light ray reflects, or bounces off of a reflecting surface, some of the light is absorbed into the surface of the reflecting material, no surface is 100% reflective. Some light rays will reflect or bounce multiple times before they exit the lamp. Some light rays will never exit the lamp. This redirection and absorption means that a directional lamp will always be less efficacious than an omnidirectional lamp. This is the reason that directional lamps must be analyzed separate and apart from omnidirectional lamps when considering efficiency regulations. This is also the reason the Congress said a reflector lamp is not a general service lamp. 42 U.S.C. §6291(30)(BB)(ii)(II). For the purposes of efficiency regulations, reflector lamps must be treated separately and differently from other types of lamps. 42 U.S.C. §6295(q). See also discussion at page 37, *infra*.

A summary of the product attributes of different types of reflector lamps is displayed in Tables 9 and 10 below:

TABLE 9
MEDIUM BASE INCANDESCENT/HALOGEN REFLECTOR LAMPS
Product Description

Wattage range	Lumen range	Voltage	Bulb shape/ size	Life rating	Consumer acquisition cost
39W-83W	520-1750	110-130V	PAR38	1000 -4000 hrs	$4.50 - $11.00
38W – 53W	520 – 920	110-130V	PAR30	1000–3000 hrs	$5.50 - $9.50
38W – 39W	490 -500	110-130V	PAR20	1000–3000 hrs	$4.70 - $8.00
30W – 45W	205-380	110-130V	R20	2000-2500 hrs	$2.75 – 8.00
45W-75W	340 – 685	110-130V	BR30	2000	$2.50 – 4.00
65W-	580 – 630	110-130V	BR40	2000	$2.25 - $4.25
35W-75W	310-990	110-130V	MR16	2000	$4.66 - $6.00
Primary application		Recessed and track lighting; outdoor spot and flood lighting (PAR 38),			

TABLE 10
PIN BASE LOW VOLTAGE HALOGEN MULTI-REFLECTOR LAMPS
Product Description

Wattage range	Lumen range	Voltage	Bulb shape	Life rating	Consumer acquisition cost
5W-35W	27-700	12V	MR11	1500-3000 hrs	$5.00-$11.00
20W-75W	240-850	12V	MR16	3000-6000 hrs	$7.00
Primary application		Recessed and track lighting			

2. Shipments of Specialty Lamps

A. Decorative lamps

The estimated shipment numbers cited by DOE in the NODA for candelabra base incandescent lamps, 82 FR at 38616 (Table II.3) finds no support among NEMA lighting manufacturers. The DOE NODA estimates are too high by a factor of more than two. NEMA speculates that DOE may be including medium base (E26) decorative lamps in its estimate and possibly intermediate base (E17) lamps (however, there are no intermediate base decorative lamps, only non-decorative specialty lamps with functional bulb design typically to address space constraints in a fixture).

NEMA also does not understand how DOE estimated that candelabra base lamps were growing (although only slightly) during this period. That is not consonant with the industry's experience or data. The shipments of candelabra base incandescent lamps have declined since 2011. NEMA data for decorative lamps includes both medium base and candelabra base decorative lamps. We subtracted the medium base decorative lamp shipments for 2012-2015 that NEMA previously provided to DOE in this rulemaking to arrive at the estimated candelabra base decorative lamp shipments shown in Table 11. NEMA manufacturers inform NEMA that their shipments of candelabra base incandescent lamps are slightly less in 2016 than 2015.

Candelabra base decorative lamps have historically enjoyed significant use in commercial applications such as hospitality and entertainment (e.g., hotels, conference facilities, theater) properties. The decline in shipments for candelabra base decorative lamps is primarily attributable to a shift to from candelabra base incandescent decorative lamps to candelabra base CFL decorative lamps, and more recently LED decorative lamps in those applications, particularly where greater operating hours for the candelabra base decorative lamps are more common such as hospitality and entertainment properties. Household candelabra base decorative lamps, by contrast, are typically not operating long hours as their fixtures are used only for short periods of time when needed in a given day (e.g. bathroom fixture) not even every day in a given week in the case of a household chandelier.

TABLE 11
CANDELABRA BASE DECORATIVE SPECIALTY INCANDESCENT LAMP
Shipment Data

	Lamp Shape	2011 Domestic Shipments	2012 Domestic Shipments	2013 Domestic Shipments	2014 Domestic Shipments	2015 Domestic Shipments	2016 Domestic Shipments
DOE NODA	B,BA,C,CA,F, G16-1/2	201 million	203 million	205 million	208 million	209 million	N/A
Index 2012=100			100	101	102.5	103	N/A
NEMA	B,BA,C,CA,F, G16-1/2	N/A	[redacted]	[redacted]	[redacted]	[redacted]	N/A
Index 2012=100			100	86.4	90.4	85	N/A

The decline in medium base decorative incandescent lamps shown in Table 12 is attributable to the cap on energy use at 40W in EISA-2007 for these exempt lamps. The 40 watt cap reduced the lamp's light output. While the reduction in light output was not as important for consumer residential applications with relatively short operating hours for these lamps who switched to 40 watt lamps, it was important for commercial applications of the medium base decorative lamps: restaurants, hotels (lobbies, conference rooms, etc), and the like. The commercial customers with longer lamp operating hours switched from medium base incandescent decorative lamps to decorative CFL and decorative LED in order to maintain the higher light output.

TABLE 12
MEDIUM BASE DECORATIVE SPECIALTY INCANDESCENT LAMP
Shipment Data

Lamp shape	2012 Domestic Shipments	2013 Domestic Shipments	2014 Domestic Shipments	2015 Domestic Shipments	2016 Domestic Shipments
B,BA,C,CA,F	45,101,327	41,807,901	29,661,407	26,470,193	N/A
Index 2012=100	100	92.7	65.7	58.7	
G25	46,402,599	43,979,690	36,905,627	33,401,786	N/A
Index 2012=100	100	94.8	79.5	72	
G30	157,629	169,429	154,008	114,951	N/A
Index 2012=100	100	107	97.7	72.9	
Total Medium base	91,661,555	85,957,231	66,721,042	59,986,930	N/A
Index 2012=100	100	93.7	72.8	65.4	

B. Functional specialty lamps

While NEMA collects data on lamps that include intermediate base (E17) incandescent lamps such as S11, T6, T7, T8, A15, those lamps fall into a catch-all class of incandescent light bulbs labeled "all other." NEMA is not able to segregate intermediate base lamps from other lamps in this group. The DOE's NODA does not attempt to break out shipments for intermediate base incandescent lamps either. The only comment that NEMA can make at this time is that 2016 shipments of the incandescent lamps in the "all other" category are 91% of 2011 shipments, trending flat to downward over the period.

TABLE 13
INTERMEDIATE BASE (E17) SPECIALTY INCANDESCENT LAMP
Shipment Data

Lamp shape	2011 Domestic Shipments	2012 Domestic Shipments	2013 Domestic Shipments	2014 Domestic Shipments	2015 Domestic Shipments	2016 Domestic Shipments
S11	N/A	N/A	N/A	N/A	N/A	N/A
T6,T7,T8	N/A	N/A	N/A	N/A	N/A	N/A
A15	N/A	N/A	N/A	N/A	N/A	N/A
R14, R16	N/A	N/A	N/A	N/A	N/A	N/A

N/A = not available.

Table 14 shows that medium base T-10 lamp shipments are falling, while medium base S14 have risen slightly since 2012, but have basically been flat. The S14 lamp is made only in very low wattage (10-15 watts) with extremely low lumen output. It is not used in lighting applications traditionally served by general service incandescent lamp that require a much higher lumen output.

TABLE 14
MEDIUM BASE SPECIALTY INCANDESCENT LAMPS
Shipment Data

	2011 Domestic Shipments	2012 Domestic Shipments	2013 Domestic Shipments	2014 Domestic Shipments	2015 Domestic Shipments	2016 Domestic Shipments
T-10	N/A	11,168,553	11,507,467	10,529,062	9,750,395	N/A
Index 2012=100		100	103	94.7	87.3	
S14	N/A	4,798,005	5,118,343	5,365,474	5,182,770	N/A
Index 2012=100		100	106	111	108	

C. Directional reflector lamps

NEMA and its members have also found that DOE's estimate of incandescent reflector lamp shipments is not consonant with industry experience and data. By any stretch of imagination, the NODA numbers for incandescent reflector lamps are not credible estimates. DOE's estimates for incandescent reflector lamps exceed industry reported shipments by *more than a factor of two*. The DOE's estimate also renders the incandescent reflector lamp roughly equal in sales to GSIL in recent years, and that is not credible. NEMA and its members cannot speculate how the estimates reported in the NODA, 82 FR at 38615 (Table II.2) were derived, but the government's estimates for incandescent reflector lamp shipments exceed domestic shipments for all types of reflector lamps in the aggregate whether they are fluorescent or LED or halogen or incandescent.

NEMA members have not experienced slightly rising or stable sales of incandescent reflector lamps as displayed in the NODA, but have experienced significant declines in this category as shown in Table 15 below. Compact fluorescent reflector and LED reflector lamps are substitutes for incandescent reflector lamps, and have replaced incandescent reflector lamps to some extent. The CFL reflector was not widely popular with household consumers because the CFL was not a good directional light source, and consumers did not find them to be as satisfactory as incandescent reflectors. Reflector CFL are beginning to disappear from store shelves as manufacturers disinvest in CFL technology. LED reflectors, on the other hand, are rapidly increasing in sales and are beginning to replace both incandescent reflectors and CFL reflectors as shown in Table 15 for the years 2015 and 2016. The other substitute impacting incandescent reflector lamps shipments are LED downlight reflector kits. In connection with renovation and new construction, the installations of hardwired LED downlight reflector kits are now starting to impact incandescent reflector lamp (both R and PAR lamps) sales in a significant way.

TABLE 15
MEDIUM BASE INCANDESCENT REFLECTOR LAMPS*
Shipment Data

	2011 Domestic Shipments	2012 Domestic Shipments	2013 Domestic Shipments	2014 Domestic Shipments	2015 Domestic Shipments	2016 Domestic Shipments
DOE NODA	308,000,000	312,000,000	315,000,000	319,000,000	316,000,000	N/A
Index NODA 2011=100	100	101	102	103.5	102.5	N/A
NEMA est.	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
Index NEMA 2011=100	100	92.5	93.2	88	73.6	70.1

*Includes incandescent reflector lamps as defined by Energy Policy and Conservation Act, including PAR, R, ER, BR, and BPAR.

NEMA members also do not find DOE's estimates of multifaceted reflector (MR) lamp shipments to be consonant with industry experience and data. The NODA lists shipments of "MR" lamps and suggests that these are pin base lamps. 82 FR at 38616 (Aug. 15, 2017). Most MR lamps are pin-base low voltage lamps and a very small fraction are medium screw base, normal household voltage. The MR lamps are fairly expensive as a household lamp, and for that reason have not found wide popularity with consumers. Most of the pin-base low voltage lamps are sold for commercial retail display lighting and museum display lighting; however, a distinct minority of these pin-base low voltage MR lamps is used in household applications. The table below compares DOE's estimates for "MR lamps" and compares NEMA data for low-voltage pin-base lamps. The shipment data in the NODA exceeds industry shipment data by more than two fold. The medium screw base regular household voltage MR lamps (not included in the table below) represent less than 10% of pin base MR lamp sales. Even if one adds shipments of these medium screw base versions of the MR lamp to the NEMA numbers for pin-base MR lamps the total is still only half of the NODA estimates. NEMA members also do not agree with the rising annual shipment estimates. Shipments of these lamps have been declining, because they are primarily used in commercial display applications with longer operating hours and there is a profound shift to LED MR lighting in those commercial settings.

TABLE 16
MULTI-REFLECTOR (MR) LAMPS
Shipment Data

	2011 Domestic Shipments	2012 Domestic Shipments	2013 Domestic Shipments	2014 Domestic Shipments	2015 Domestic Shipments	2016 Domestic Shipments
DOE NODA*	48,700,000	49,300,000	49,800,000	50,400,000	49,700,000	N/A
Index NODA	100	101	102.2	103.4	102.8	
NEMA Low voltage pin	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
Index NEMA	100	102.7	96.1	72.4	62.9	51.7

Lamp Switching and More Efficacious Substitutes

In the NODA, DOE "seeks comment on the potential for lamp switching and whether more efficacious substitutes exist for all GSILs and other incandescent lamps." DOE further "seeks information on whether specific categories of incandescent lamps have features that constrain their use to unique applications and whether more efficient products can be adequate replacements in those applications." 82 FR at 38616 (Aug. 15, 2017).

Our preceding comments address facts relating to switching (or the difficulty of switching) among specialty incandescent lamps and GSILs and the availability of more efficacious substitutes. Our comments are based on observations and extensive industry knowledge about what consumers actually do in selecting lighting for a particular application. We summarize briefly:

1. Lamp attributes that inhibit or deter switching.

- Intermediate base and candelabra base incandescent lamps have extremely low potential for lamp switching with a GSIL. This is true not only because (a) an intermediate base and candelabra base lamp will not screw into a medium screw base socket for which the GSIL is designed, but *also* because (b) the lumen output of the intermediate base and candelabra base lamps is lower than the range of common lumen outputs for GSIL, *and* (c) because consumers do not find the smaller form factor of the bulb of these lamps to be suitable for the traditional applications served by the GSIL. The price of these smaller base lamps is typically higher than a GSIL and the consumer would incur high switching costs to change the fixture to accommodate a smaller lamp base. Other pin-base and plug base lamps likewise have extremely low potential for switching for GSIL.

- Among decorative and other specialty incandescent lamps with a medium screw base, the potential for lamp switching with a GSIL is also extremely low. This is true because (a) the lumen output of these decorative incandescent (B, BA, C, CA, F, G25, G30 bulb shapes) and other incandescent lamps (T9, T10, T12, T14, S14, A15, R14, R16) is lower than the range of common lumen outputs for GSIL (as discussed earlier at pages 12-13), *and* because consumers do not find the smaller form factor of the bulb of these lamps to be suitable for the traditional applications served by the GSIL. One only needs to observe how these decorative and other specialty incandescent lamps are actually used by consumers (decorative lighting fixtures, bathroom/dressing room vanity lights, fixtures with a small amount of space for a lamp, furniture displays, music stands, signs, and appliances), and those uses are not the same sockets and applications used by GSIL. The same is true in reverse: GSIL are not commonly used in these special applications because the GSIL's A17 or A19 bulb shape is too large for the application or looks aesthetically inappropriate to the consumer.

- Lamps designed for lower or higher voltages than the United States household 110V – 130V voltage range used for lighting and for which the GSIL is designed have an extremely low potential for lamp switching with a GSIL. A 12V or 24V lamp will burn out almost instantly if it could even be inserted into a 120V socket, and therefore requires a transformer (with its own incremental cost) and a

different lamp base in order to be used with a nominal 120V socket. As discussed earlier, these low voltage lamps are typically bi-pin lamps and will not screw into a medium screw base socket for which the GSIL is designed. See pages 14-17, *supra*. They also have a very small form factor to serve their special lighting applications. A lamp designed for a higher European lamp voltage (220V – 240V) cannot be used in a lighting socket served by a nominal 120V line, as they have a different base. Even if a 240V lamp could be used, the detrimental consequence to the consumer that the light output of the nominal 240V design lamp in a 120V socket will be at best half that of the same lamp designed for a 120V nominal voltage.[27] Higher voltage lighting sockets are rarely found in the United States. These rare cases are typically industrial environments where a 220V or 240V line to a lighting socket might be found --- and typically for a special double-ended quartz halogen lamp.

- Reflector or directional lamps also have a low potential for lamp switching with a GSIL. NEMA is mindful of the DOE's observation in its Final Rule on the definition of a general service lamp that "the presence of reflector lamps in residences in the U.S. has grown significantly over time due to changes in new construction. *** Lighting in homes that traditionally was provided by A shape lamps in floor and table fixtures is being provided in newer construction through reflector lamps in recessed lighting." 82 FR at 7293 (January 19, 2017)(citations omitted). NEMA agrees with the historical observation about new construction and the increased placement of recessed lighting in homes over a long period of time, but the observation does not explain whether directional lamps serve "lighting applications traditionally served by general service incandescent lamps." It more accurately explains that certain areas of a home are no longer general service lamp applications. As the Rensselaer Lighting Research Center explained:[28]

> Lighting applications are primarily categorized as general lighting, directional lighting and aesthetic lighting. Whereas general (or ambient) lighting provides a uniform amount of lighting throughout an area, directional lighting provides illumination on a work surface (such as a desk or countertop), on an object (such as artwork), or in a particular direction.
>
> Directional lighting is typically used to provide a higher light level than that of the surrounding area and can be used alone or as a complement to ambient illumination. Directional lighting is used when high light levels are required for demanding visual tasks or for accenting purposes. For the purposes of this discussion, direct, task, and accent lighting all belong to the directional lighting category.
>
> *** The three primary types of directional lighting are accent lighting, downlighting, and track lighting. ***

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[27] https://stab-iitb.org/newton-mirror/askasci/eng99/eng99336.htm

[28] *A Guide to Residential Directional Lighting* at 3-5 (RPI Lighting Research Center 2007) available at http://www.lrc.rpi.edu/programs/solidstate/assist/pdf/directional1.pdf

> The most common use of directional lighting is for accent purposes. Accent lighting is used to highlight works of art, architectural features, plantings, and other items of interest. ***The most important feature of accent lights is their ability to provide a controlled beam of light.
>
> Recessed accent lights are similar to downlights (see below), but the fixture opening is cut at an angle so that the bulb, or lamp, can be aimed without blocking any light. ***
>
> As their name implies, downlights direct light straight down from the fixture. * * *
>
> Track lighting is very flexible and can be focused at almost any position to light different objects. It is usually easier to install and maintain than recessed lighting. *** However, if not done with care, it can be visually cluttering, distracting, and glary, especially in low ceilings.***

The DOE's observation in January 2017's Final Rule that recessed lighting fixtures utilizing directional reflector lamps in homes grew over time reflects the fact that architects and home builders recognized that consumers wanted and preferred brighter task lighting from downlights over their kitchen and food preparation surfaces, desks and other work surfaces; they wanted and preferred focused accent lighting focused on walls, artwork, or other architectural features of their homes; they wanted downlights where the recessed fixture concealed the light source. It reflects the fact that consumers regarded GSIL as unsatisfactory for these applications. Once the recessed lighting fixture was installed in new construction for the purposes described above by the Lighting Research Center, the application was no longer an application traditionally served by the GSIL, because the general service incandescent lamp was not satisfactory for those applications. The DOE's observation in the Final Rule quoted above overlooks these essential facts about consumer behavior.[29]

- Finally, pin-base and prong-base lamps are not close or effective substitutes for the GSIL. There are no pin-base GSIL (by legal definition certainly, but in fact as well).

The medium screw base is by far the predominant lamp base used with well in excess of ninety-five percent of GSL. The exception is the GU-24 pin base (twist lock) CFL (instead of a medium screw

[29] NEMA says this is true, while acknowledging that it is not unheard of for a consumer to screw a GSIL or an MBCFL into a recessed lighting fixture or a track light, but this is not a dominant or common form of consumer behavior. Consumers, in the vast majority of cases, replace directional reflector lamps with other directional reflector lamps. Consumers do not replace a GSIL, or MBCFL, or general service LED (A-line) lamp in a floor or table lamp fixture providing ambient, omnidirectional lighting with a reflector lamp where the directional light will be pointed at the ceiling. Consumers will not place a reflector lamp in a floor or table lamp fixture where the sockets utilizing a GSIL are horizontal. Consumers in almost all cases replace GSIL with other omnidirectional lamps with very similar physical and photometric attributes. When consumers want directional lighting instead of ambient omnidirectional lighting, they will have to incur the additional cost of changing the fixture (a new recessed can, track lighting) to maximize the use of a directional reflector lamp.

base). One state, California,[30] and a few local jurisdictions adopted building code regulations requiring the installation of GU-24 lampholder sockets that would require the use of CFL (and now some LED) lamps with a GU-24 pin base in those GU-24 sockets in new residential construction. The ENERGY STAR program similarly promoted the GU-24 fixture socket beginning in 2005; however, national shipments of GU-24 pin-base CFLs never exceeded 7% of national CFL sales. As a result, GU-24 pin base CFL became a substitute for the general service incandescent lamp, primarily in limited quantities. The GU-24 base lamp was intended to prevent substitution of GSIL for CFL and the pin-base lamp is not a replacement in a medium screw base socket.

A GU-24 pin base lamp	A GU-4 pin base lamp	A prong base lamp
		

2. The availability of more efficacious substitutes for the GSIL

Our preceding comments have highlighted the more efficacious lamps that have been or are serving lighting applications traditionally served by the GSIL: (1) the medium screw base compact fluorescent lamp, (2) the medium screw base general service (A-line) LED lamp; and (3) in limited instances the GU-24 bi-pin base compact fluorescent lamp and the GU-24 bi-pin base general service (A-line) LED lamp.[31] Additionally, a new lamp product has recently entered the market that is a direct replacement for the general service incandescent lamp and serves the same applications as those traditionally served by the general service incandescent lamp: the A-line induction lamp.[32]

There are no GSIL available that are more efficacious than the current GSIL on the market, and for the reasons that NEMA discussed in considerable detail in prior comments in this rulemaking, there is no expectation that a more efficacious GSIL will be available because it provides very limited

[30] See e.g., 24 CCR §150.0(k) and Table 150.0-A.

[31] The GU-24 pin base lamp sells at a significant price premium to the MBCFL. We note that a GU-24 pin base CFL (60 watt equivalent) is promoted on the Home Depot website for between $7.87 and $9.87 per lamp, and an MBCFL (60 watt equivalent) is promoted by Home Depot for between $1.50 and $2.45 per lamp. See http://www.homedepot.com/b/Lighting-Ceiling-Fans-Light-Bulbs-CFL-Light-Bulbs/N-5yc1vZbmat (accessed October 2, 2017). Other retail websites confirm the difference in pricing.

[32] http://finallybulbs.com/the-bulb/

improvement in energy savings and cannot be economically justified.[33] Lighting manufacturers investigated, manufactured and sold a slightly more efficacious GSIL for a couple of years and there was no consumer acceptance for the product because it was too expensive given the product safety requirements that had to be built into that lamp. Manufacturers and retailers both lost money on that lamp.

3. The availability of more efficacious substitutes for other incandescent lamp types

As an initial observation about lamp switching and substitutes, our comments demonstrate that lamp switching occurs within narrow types of lamps, but not broadly among the different lamp types.

- Consumers don't commonly switch or substitute[34] directional reflector lamps for decorative specialty lamps or tubular shape lamps regardless of the technology used with the lamp. Just like a consumer will not switch or substitute an LED PAR lamp for an LED bent tip candle lamp, the consumer will not switch or substitute an LED PAR lamp for an incandescent bent tip candle lamp. The lamp types serve entirely different applications.
- Consumers don't commonly switch or substitute decorative specialty lamps for reflector lamps.
- Consumers don't commonly switch or substitute specialty lamps (including those just mentioned) for GSIL or other general service lamps.
- Lamp switching and substitution occurs almost entirely within a narrow common lamp type. Thus a reflector lamp will substitute for another reflector lamp; a globe lamp will substitute for another globe lamp provided that the lamp's form factor meets the consumer's requirements; a "candle" shape decorative lamp (B, BA, C, CA or F) will substitute for another "candle" shape decorative lamp provided that the lamp's form factor meets the consumer's requirements. Sometimes the form factor is different between similar lamp types as shown in the photograph below where the LED blunt tip (B shape) lamp is larger (due to the space taken up by the lamp's electronics) than the incandescent blunt tip (B shape) lamp it replaced in a fixture. The LED version of the same lamp type now protrudes from the lamp fixture in a manner that the incandescent blunt tip lamp did not protrude (and was concealed) presenting aesthetic concerns for the homeowner.

[33] See NEMA Comments at 50-56 (May 16, 2016). EERE-2013-BT-STD-0051-0066.

[34] We say "frequently" or "commonly" because one can never say never, but such switching is a rare exception.

NEMA identifies below the specific lamp types that are available in incandescent, fluorescent and LED technologies.

Lamp Technology →	Incandescent /Halogen	CFL	LED
Lamp Type ↓	Available in market?	Available in market?	Available in market?
Medium Screw Base Integrated Non-Reflector 310-2600 initial lumens	No	Yes	Yes
Medium Screw Base Non-Integrated Non-Reflector 310-2600 initial lumens	Yes	No	No
GU-24 base Integrated non-reflector 310-2600 lumens	No	Yes	Yes
GU-24 base Non-integrated non-reflector 310-2600 lumens	No	Yes	No
REFLECTOR LAMPS			
Medium screw base MR 16 shape	Yes	No	Yes, in lower lumens only
Pin base (GU5.3) MR 16 shape	Yes	No	Yes, in lower lumens only
Pin base (GX5.3) MR 16 shape	Yes	No	Yes, in lower lumens only
Pin base (GU10) MR 16 shape	Yes	No	Yes, in lower lumens only
Screw terminal base (G54) reflector lamps	Yes	No	Yes
Medium side prong base (G12.7) reflector lamps	Yes	No	No
Skirted medium screw base reflector lamp	Yes	Yes	Yes
Mogul prong base reflector lamp	Yes	No	No
SPECIALTY NICHE APPLICATIONS			
Appliance	Yes	No	Yes some (in lower lumens), but not all

			appliance applications (e.g. ovens won't work)
Black light	Yes	Yes	Yes
Bug	Yes	Yes	Yes
Colored	Yes	Yes	Yes
Infrared	Yes	No	No
Left hand thread	Yes	No	No
Marine	Yes	No	No
Marine signal	Yes	No	No
Mine service	Yes	No	No
Plant light	Yes	Yes	Yes
Rough service	Yes	No. CFL lamp has a short cathode that is inherently robust.	No. LED lamp has no filament to protect. Inherently robust
Shatter resistant	Yes	Yes	Limited[35]
Showcase	Yes	Yes (cold cathode only)	No
Sign service	Yes	Yes	Yes, but may present performance issues with flashing signs.
Silver bowl	Yes	Yes	Yes
Three-way	Yes	Yes	Yes
Traffic signal	Yes	No	Yes
Vibration service	Yes	No. CFL lamp has a short cathode that is inherently robust.	No. LED lamp has no filament to protect. Inherently robust.
SPECIAL GLOBE SHAPES			
G-shape	Yes	Yes, but declining rapidly with LED.	Yes
B-shape	Yes	Yes	Yes, size and aesthetics issues
BA-shape	Yes	Yes	Yes, size and aesthetics issues
CA (candle) shape	Yes	Yes	Yes, size and aesthetics issues
F (flame) shape	Yes	Yes	Yes, size and aesthetics issues
G16-1/2 shape	Yes	No	Yes
G25 shape	Yes	Yes	Yes
G30 shape	Yes	Yes	Yes
M14 shape	No	No	No
S shape	Yes	No	Yes, in low lumens only
T shape	Yes	Yes	Yes
SPECIAL BASES			
Intermediate base	Yes	Yes	Yes
Candelabra base	Yes	Yes	Yes
Bayonet base	Yes	No	Yes
Double ended base	Yes	No	Limited[36]

[35] One company is known to market a "waterproof" LED that has a shatter-resistant bulb.

[36] In low lumens only. Due to lamp size and dimensions, double ended LED products cannot fit in many fixtures and they are limited to use in fixtures that can accommodate a substantially larger physical shape.

Recessed Single Contact base	Yes	No	No
Mogul Screw and mogul bi-post base	Yes	No	No
G53 base	Yes	No	No
Double Contact Prefocus base	Yes	No	No
2-pin bases	Yes	No	Limited[37]
Other Excluded			
Lamps greater than 2600 lumens	Yes	Yes	Yes.[38]

PART TWO

In Part Two, Subpart A of these Comments, NEMA sets forth its framework for the scope of the terms "general service incandescent lamp" (GSIL) and correspondingly for "general service lamp" (GSL) as used in the Energy Policy and Conservation Act (EPCA). See 42 U.S.C. §6291(30)(D), §6291(30)(BB). We note that the NODA states that "any data received in response to this NODA could result in a reassessment of the assumptions and determinations made in the January 2017 definition final rules." 82 FR at 38616. We begin with a construction of the statute, a legal exercise, which we submit is also supported by factual responses to questions posed by DOE in the NODA that are provided in Part One of these Comments. NEMA specifically requests DOE to reconsider its definition of general service lamp established in the Final Rules published in the Federal Register on January 19, 2017 in light of these Comments.

In Part Two, Subpart B of these Comments, NEMA sets forth its framework for this rulemaking in general.

Subpart A: THE STATUTORY DEFINITIONS OF GENERAL SERVICE INCANDESCENT LAMP AND GENERAL SERVICE LAMP

1. A CRITIQUE OF DOE'S APPROACH TO THE STATUTORY DEFINITIONS

In addition to the three types of lamps that Congress specifically identified as "general service lamps" in EPCA --- GSIL, CFL, and general service LED lamps --- Congress authorized the Secretary of Energy to include in the definition of general service lamps "any other lamps the Secretary determines are used to satisfy lighting applications traditionally served by general service incandescent lamps." 42 U.S.C. §6291(30)(BB)(i)(IV). Rather than investigate the "lighting applications traditionally served by

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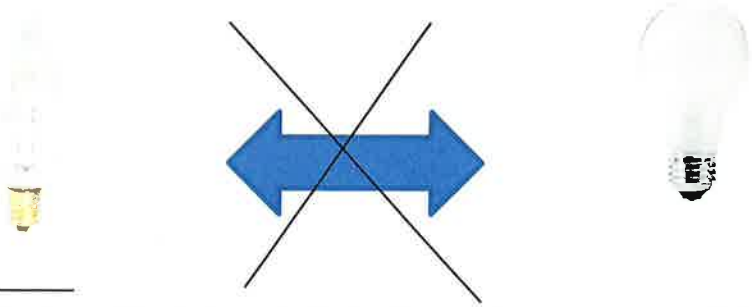
[37] In lower lumens only. Due to lamp size and dimensions, 2-pin LED products cannot fit in many fixtures and they are limited to use in fixtures that can accommodate a substantially larger physical shape.

[38] Higher lumen output LEDs are substantially more expensive and also physically larger than high lumen incandescent lamps, and they will not fit in standard fixtures for high lumen output lamps. The LED high lumen output lamps are primarily a substitute for high wattage CFL (55W+) and low wattage HID lamps, although replacing an HID lamp can require fixture rewiring to remove the ballast in order to operate. They are not good substitutes for high lumen incandescent lamps.

general service incandescent lamps" as NEMA has done in Part One of these Comments, see page 2 *supra* and page 44 *infra*, and contrast them with the actual lighting applications served by specialty lamps, see pages 10-21 *supra*, the DOE's Final Rules published January 19, 2017, 82 FR 7276 (GSL Rule) and 82 FR 7322 (IRL Rule) effectively re-wrote this portion of the statute as follows:

> (IV) any other lamps the Secretary determines are used ~~to satisfy lighting applications traditionally served by general service incandescent lamps~~ in general lighting applications.[39]

NEMA submits, for legal reasons explained later, that rewriting the statute in this manner is contrary to law and is not authorized by EPCA.[40] It violates basic principles of statutory construction. Broadly, there are two reasons for NEMA's objection. First, the DOE's amendment to the statute as just described causes the Secretary to abandon any inquiry into the lighting applications traditionally served by general service incandescent lamps. This has the consequence of eliminating the general service incandescent lamp and its lighting applications as the statute's benchmark referent for those "other lamps" that might be included in the definition of "general service lamp." Liberated by this re-write of the statute from the specific statutory referent that Congress intended the Secretary to focus upon, the DOE redirected its attention to whether a lamp is "used in general lighting applications," a phrase so vague (despite its statutory definition for another purpose in EPCA), it opened the door for the DOE to include nearly anything that emits light in the class of "general service lamp." That is our second objection. This creates the unlikely and incongruous result, for example, that a candelabra base (E12) "flame" (F) shape decorative lamp with a lumen output of 160-580 lumens became part of the same class of lamps that are used to satisfy lighting applications traditionally served by the general service incandescent lamp with its larger medium screw base (E26), larger pear shape bulb, with a lumen output range from 400 – 1750 lumens. The twain don't meet here: a consumer cannot use a candelabra base lamp in a medium screw base application, the shape of the bulb is not desired by the consumer for GSIL application, and the lumen output of the decorative lamp is too low for most applications traditionally served by general service incandescent lamps. And there are many other examples of incongruous results. The DOE's re-write of the statute enabled the DOE to imagine the "potential for lamp switching" without having to assess whether *actual* lamp switching was rare, exceptional, or unlikely due to physical or economic factors like those NEMA has enumerated above.



[39] DOE's revised definition of general service lamp reads, "*General service lamp* means a lamp *** *used in general lighting applications*." 82 FR at 7321 (Jan. 19, 2017)(emphasis supplied).

[40] See *Nat'l Elec. Mfrs. Ass'n v. Department of Energy*, 654 F.3d 496, 506 (4th Cir. 2011)(refusing to re-write statutory language by inserting text in definition beyond the text that Congress supplied).

Congress defined the phrase "general lighting applications" to mean "lighting that provides an interior or exterior area with overall illumination." 42 U.S.C. §6291(61). Immediately, it should be recognized that the phrase "overall illumination" is not defined and DOE concluded that it could attempt to define that phrase as it thought appropriate. The GSL Rule discusses:

> As described in the October 2016 NOPDDA, DOE considers the term ''overall illumination'' to be similar in meaning to the term ''general lighting'' as defined in the industry standard ANSI/IES RP–16–10 (hereafter ''RP–16''). RP–16 states that ''general lighting'' means lighting designed to provide a substantially uniform level of illuminance throughout an area, exclusive of any provision for special local requirements.

82 FR at 7303 (January 19, 2017). If that is the meaning of "overall illumination," then --- as the discussion of reflector lamps *supra* at pages 17-21 and 27-28 in Part One of these comments confirms--- *reflector lamps cannot be "general service lamps" because reflector lamps, by their nature, do not provide "a substantially uniform level of illuminance throughout an area."* As the Rensselaer Lighting Research Center explained in its paper on residential directional lighting, "Whereas general (or ambient) lighting provides a uniform amount of lighting throughout an area, directional lighting provides illumination on a work surface (such as a desk or countertop), on an object (such as artwork), or in a particular direction. Directional lighting is typically used to provide a higher light level [*i.e.* non-uniform light] than that of the surrounding area and can be used alone or as a complement to ambient illumination." *A Guide to Residential Directional Lighting* at 3 (RPI Lighting Research Center 2007), *supra*. What this demonstrates is that --- for DOE --- "overall illumination" means whatever DOE subjectively wants it to mean, with no objective criteria to support the Secretary's determination. This deviates from the more objective approach demanded by Congress in the statute by making the lighting applications traditionally served by the general service incandescent lamp the benchmark referent for "other lamps" that the Secretary could identify as general service lamps.

NEMA respectfully submits that DOE's attempt to re-write the statute completely ignored the statutory context in which the term "general lighting applications" was used by Congress in EPCA. The term was introduced into EPCA in a different part of the EISA-2007 amendments to EPCA that were specific to metal halide lamp fixtures. Pub.L. 110-140, 121 STAT. 1492, 1592; 42 U.S.C. §6291(61) and (64). Congress defined the metal halide lamp fixture as "a light fixture for general lighting application designed to be operated with a metal halide lamp and a ballast for a metal halide lamp." *Id.* It is the metal halide lamp fixture context that gives meaning to the term "general lighting application" and "overall illumination."

DOE should have inquired: What did Congress mean by "providing an interior or exterior area with overall illumination" when it defined "general lighting applications," and does that term provide any room to exercise "expert judgment" about what "other lamps" are GSLs? The phrase "overall illumination" is enormously subjective --- it is in the eye of the beholder. For example, how large is the "area" to which "overall illumination" must be provided? Are we talking about a small area on a wall for

a painting or a small bedroom closet? Or are we talking about a larger area such as a parking lot or a large industrial warehouse? It turns out Congress did have a very wide area in mind when it introduced this term into the statute for another purpose than DOE has now used it.

The metal halide lamp fixture to which the term "general lighting application" and the phrase "overall illumination" is applied in EPCA is a reference to bright lamps and fixtures used in football and baseball stadium lighting, parking and street light applications, large warehouse and retail applications. So when Congress adopted the term "general lighting applications" as "providing an interior or exterior area with overall illumination," Congress was thinking about very large areas where bright light needs to be distributed such as football stadiums, outdoor areas and large commercial and industrial areas, not closets, bedrooms or dining rooms. *And DOE knows this.* In 2014, when DOE completed a rulemaking for metal halide lamp fixtures, DOE identified the specific uses of metal halide lamp fixtures in warehouses, street lighting, stadium lighting and search lights. 79 Fed.Reg. 7746, 7755, 7762 (February 10, 2014)(metal halide lamp fixtures "are commonly used in warehouse, street, and general commercial lighting. High-wattage (greater than 500 W) lamps are used in searchlights, stadiums, and other applications that require powerful white light."). DOE inappropriately grabbed a phrase from a very different part of the statute to suit a different purpose. In that statutory context, the phrase "general lighting applications" had a distinct meaning with respect to wide area lighting in stadiums, parking lots, searchlights, retail and commercial warehouses, and it does not refer to overall illumination of a household closet, bathroom, bedroom, garage, kitchen or living room or a spot on a wall. The specific statutory context in which the phrase "general lighting application" was used and intended by Congress provides an objective reference for the meaning of the statutory phrase very different than the subjective application that DOE adopted in the Final Rule.

As DOE reviews the information provided in response to the NODA, NEMA respectfully requests that DOE apply *Congress' test* for "other lamps" that could be a "general service lamp." It is NEMA's contention that DOE should identify the "lighting applications traditionally served by general service incandescent lamps" and ask whether other lamps serve those same applications without regard to the phrase "general lighting applications" or "overall illumination." It is the lighting applications traditionally served by general service incandescent lamps that are the objective statutory benchmark for the Secretary's determination of what other lamps are general service lamps. The general service incandescent lamp has well-defined attributes and applications, and NEMA's comments in Part One provides that information.

The application of the term "general lighting applications" to directional lighting (reflector lamps) and special purpose low lumen light bulbs that operate solely at the very bottom of the broader lumen output range of general service incandescent lamps, compact fluorescent lamps, and general service LED lamps used in consumer household applications eviscerates EPCA's statutory distinction between "general service" lamps and lamps designed or used in "special applications." Entirely missing in the DOE's GSL rule is any discussion of the term "general." The term is used with some ubiquity in the lighting provisions of EPCA. See e.g., 42 U.S.C. §6291(30)(B)(general service fluorescent lamp "used to satisfy the majority of fluorescent applications"); §6291(30)(D)(general service incandescent lamp

"intended for general service applications"); §6291(30)(S)(medium screw base compact fluorescent lamp does "not include any lamp unlikely to be used in general purpose applications"); §6291(30)(BB)(general service lamp includes "general service incandescent lamps . . .general service LED lamps, and any other lamp . . . used to satisfy lighting applications traditionally served by general service incandescent lamps").

The dictionary definition of the term "general" means "affecting or concerning all or most things; widespread; . . . not specialized or limited in range of subject, application, activity." Oxford English Dictionary (general)(emphasis supplied). See also Merriam Webster Dictionary (general): "not confined by specialization or careful limitation; belonging to the common nature of a group of like individuals; applicable to or characteristic of the majority of individuals involved." Not surprisingly, EPCA mirrors this same point: the "general" does not include what is "special." This is especially clear in EPCA's definition of one type of "general service lamp", the medium base compact fluorescent lamp. 42 U.S.C. §6291(30)(S). Congress said that general service lamp does "*not include* any lamp that is-- (aa) specifically designed to be used for *special purpose applications*." *Id.* (emphasis supplied). This same definition refers to the laundry list of lamps "not included" in the definition of general service incandescent lamp because they are "(bb) unlikely to be used in general purpose applications, such as the applications described in subparagraph (D)." *Id.* See also 42 U.S.C. §6291(30)(B)(general service fluorescent lamp does not include lamps used in "nongeneral applications"). Congress' lists of what are not included in the definitions of various "general service" lamps are consistently lamps that are used in "special purpose applications" or "nongeneral applications."

Consistent with the dictionary definition of the term "general", NEMA highlighted in Part One of these Comments "the common nature [attributes] of a group of like [general service lamps]": (1) omnidirectional lighting, (2) providing lighting service generally across a broad range of consumer household lumen outputs, (3) within a narrow range of common consumer household voltages, and (4) the most common consumer household lamp sockets. In Part One of NEMA's Comments, we discussed the attributes of lamp types that are "specialized" and are "limited in range of application, activity." See pages 9-21, 26-29, *supra*. These specialty lamps have attributes that do not "belong to the common nature of a group of like [general service lamps]."

The practical and legal significance of DOE's injection of this highly subjective, elastic terminology into a definition for which it was never intended is that the phrase "provides overall illumination" was used to justify DOE's decision to claim that a specialty lamp Congress said was "not included" in the definition of GSL would now be a GSL. *See* 82 Fed.Reg. at 7293 (reflector lamps), at 7294 (T-shape lamps), at 7295 (B, BA, CA, F, G16–1/2, G25, G30, S, and M–14 shape lamps), at 7297 (3-way, shatter-resistant lamps). These are lamps that DOE's Final Rule determined were GSLs, but in fact are not "used to satisfy lighting applications traditionally served by the" standard incandescent lamp. DOE should reconsider its determinations under 42 U.S.C. §6291(30)(BB)(i)(IV).[41]

[41] Alternatively, even if DOE should, after reconsidering this part of its general service lamp definition, conclude that the term "general lighting applications" does have meaning for the term "general service lamps", its application to (i) directional reflector lamps and (ii) lamps that operate strictly at lower lumen outputs is error.

2. GENERAL SERVICE LAMPS ARE A "CLASS" OF COVERED PRODUCTS UNDER EPCA; GSIL, CFL, AND GENERAL SERVICE LED LAMPS ARE "TYPES" OF COVERED PRODUCTS

With the definition of "general service lamp," Congress identified a "group of covered products." EPCA treats a group of covered products as a "class of covered products". 42 U.S.C. §6291(9) (defining a class of covered products as comprised of "a group of covered products" whose "functions and intended uses are similar"). Congress described the general service incandescent lamp as a "standard incandescent or halogen *type* lamp." 42 U.S.C. §6291(30)(D)(i)(emphasis supplied). EPCA refers to specific covered products as "a *type* specified in section 6292." 42 U.S.C. §6291(2)(emphasis supplied). Elsewhere, EPCA recognizes that the Secretary may adopt separate standards for different *types* of covered products within a class of covered products provided that the different types of covered product "have a capacity or other performance-related feature which other products within such . . . (class) do not have and such feature justifies a higher or lower standard from that which applies (or will apply) to other products within such . . . class." 42 U.S.C. §6295(q)(1)(B).

Consistent with our previous comments in this rulemaking, NEMA submits that the general service LED lamp has a capacity or other performance feature that justifies a higher standard than that for compact fluorescent lamps or general service incandescent lamp; similarly, compact fluorescent lamps have a capacity of other performance feature that justifies a higher standard than that for general service incandescent lamps. A general service incandescent lamp creates light by heating a piece of tungsten wire, called a filament, until it produces light. This process only converts less than 10% of the energy used to heat the filament into light.[42] Fluorescent lamps, in contrast, create light through a process known as fluorescence. This is true whether the lamp is four foot long or small like a CFL (compact fluorescent lamp). In a fluorescent lamp, an electrical current passes through a mixture of a noble gas[43] and mercury. When excited by the current, the mercury atoms release photons primarily in the ultraviolet (UV) region. These UV photons travel to the wall of the fluorescent tube where they hit a fluorescent coating which absorbs the UV photons and produces visible light. This process converts more energy to light than an incandescent lamp, but only about 28% of the input energy produces light.[44] Light-emitting diodes, on the other hand, create light by passing an electrical current through a solid semiconductor material. The semiconductor material contains a p-n junction. The current causes holes to flow from the p-region towards the junction, and electrons to flow from the n-region towards the junction. At the junction, the electrons and holes recombine and release photons in the UV, visible,

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None of these lamps provide "overall illumination" of an area by any stretch of the imagination. They are by special design not intended to provide overall illumination, but instead provide a focused narrow beam width of illumination directed at a small area, or to provide low lumen ambient or decorative illumination.

[42] Illuminating Engineering Society, The Lighting Handbook, 10th Edition, page 7.13.

[43] Typically argon.

[44] Illuminating Engineering Society, The Lighting Handbook, 10th Edition, Figure 7.32.

or infrared (IR) region depending on the exact materials used in the semiconductor. The process of creating light via a semiconductor is much better at converting input energy to light than an incandescent lamp and somewhat better at converting energy light than a CFL. In 2016, the overall LED warm white commercial package efficiency was about 33%.[45]

For the foregoing reason, the general service incandescent lamp, the compact fluorescent lamps, and the general service LED lamp are different *types* of covered products within the broader class of covered products known as general service lamps and should be treated differently for regulatory purposes under EPCA. 42 U.S.C. §6295(q). This may also be true for any "other lamps" the Secretary determines are used to satisfy lighting applications traditionally served by general service incandescent lamps under §6291(30)(BB)(i)(IV).[46]

NEMA submits that Congress intended separate energy conservation standards for separate types of general service lamps. NEMA recommends separate energy conservation standards for general service incandescent lamps, compact fluorescent lamps, general service LED lamps, and other lamps the Secretary appropriately includes in the class of general service lamps.

NEMA is pleased that the Secretary is undertaking to make the statutory determination whether standards for general service incandescent lamps should be amended. 82 Fed.Reg. at 38614 (August 15, 2017). As we explain later, this determination with respect to a specific "type" of lamp is expressly required by Congress as is the determination of whether exemptions for certain incandescent lamps should be maintained or discontinued (in which case a new energy conservation standard would be applied to a type of previously exempt lamp for the first time).

The statute explicitly contemplates that Congress' intended the Secretary to promulgate separate energy conservation standards (amending, not amending, or adopting new) for "types" of general service lamps. See 42 U.S.C. §6295(*i*)(6)(A)(i)(I) and discussion of this statutory clause at pages 61-64 *infra*. It further reveals that it was not Congress' intent for the Secretary to adopt a single energy conservation standard for general service lamps that would eliminate an entire "type" of lamp from the market.[47] And by directing the Secretary not to limit this rulemaking to incandescent lamp technologies, 42 U.S.C. §6295(i)(6)(A)(ii)(I), Congress was expecting the Secretary to likewise promulgate separate energy conservation standards (amending, not amending, or adopting new) for compact fluorescent,

[45] US Department of Energy, DOE SSL Program, "R&D Plan," edited by James Brodrick, Ph.D., June 2016, pg. 56.

[46] There is at least one new lamp type in the market since 2007 that meets the requirements for a general service lamp described by NEMA in these comments: the induction lamp. See http://finallybulbs.com/the-bulb/

[47] NEMA raised this point previously in comments in this rulemaking. EERE-2013-BT-STD-0051-0066, NEMA Comments at 26-27 (May 16, 2016)(" everything about the Act and its history informs that it was Congress' intent to ensure the continuing presence of incandescent lamps in the market."). Congress' request that the Secretary consider "a minimum standard of 45 lumens per watt for general service lamps", 42 U.S.C. §6295(i)(6)(A)(ii)(II), is not to the contrary, as NEMA explained in previous comments. EERE-2013-BT-STD-0051-0066, NEMA Comments at 30-31 (May 16, 2016)("[This subclause] was aimed at including incandescent lamps meeting standards that were technologically feasible and economically justified."). DOE has acknowledged that a 45 lumen per watt standard would preclude the use of incandescent lamps. 82 Fed.Reg. at 7301 (January 19, 2017).

general service LED, other lamp types used to satisfy lighting applications traditionally served by general service incandescent lamps, and certain incandescent, compact fluorescent, LED that whose exemption from regulation was to be discontinued.

3. PRINCIPLES OF STATUTORY CONSTRUCTION

As a guide for NEMA's analysis in Part Two of these Comments, we cite below key principles of statutory construction that NEMA believes are applicable and should inform the DOE's understanding of Congress' intent for this rulemaking. Additional principles of statutory construction are applied in specific contexts in the comments that follow. Consistent with the principles quoted below, we make every effort to account for the language employed by Congress in the statute, the context in which it is used, and the broader context of the statute as a whole.

> [A]gencies must operate "within the bounds of reasonable interpretation." And reasonable statutory interpretation must account for both "the specific context in which . . . language is used" and "the broader context of the statute as a whole." A statutory "provision that may seem ambiguous in isolation is often clarified by the remainder of the statutory scheme . . . because only one of the permissible meanings produces a substantive effect that is compatible with the rest of the law." Thus, an agency interpretation that is "inconsisten[t] with the design and structure of the statute as a whole," does not merit deference.

Util. Air Regulatory Group v. EPA, 134 S. Ct. 2427, 2442 (2014)("*UARG*")(citations omitted); *Lee v Norfolk So. Ry*, 802 F.3d 626, 631 (4th Cir. 2015); *Brown & Williamson Tobacco Corp. v FDA*, 153 F.3d 155, 161-62 (4th Cir. 1998)("no deference is due the FDA's construction of the Act unless it is acting within the bounds of its congressionally-established authority."), *aff'd*, 529 U.S. 120 (2000).

> What the legislative intention was can be derived only from the words they have used; and we cannot speculate beyond the reasonable import of these words. *** Just as Congress' choice of words is presumed to be deliberate, so too are its structural choices.

Univ. of Tex. Southwestern Med. Ctr. v. Nassar, 133 S.Ct 2517, 2528-29 (2013)(citations omitted).

> Deference to the supremacy of the Legislature, as well as recognition that Congressmen typically vote on the language of a bill, generally requires us to assume that the legislative purpose is expressed by the ordinary meaning of the words used. Going behind the plain language of a statute in search of a possibly contrary congressional intent is 'a step to be taken cautiously' even under the best of circumstances. When even after taking this step nothing in the legislative history remotely suggests a congressional intent contrary to Congress' chosen words, and neither appellees nor the dissenters have pointed to anything that so suggests, any further steps take the courts out of the realm of interpretation and place them in the domain of legislation.

United States v. Locke, 471 U.S. 84, 96 (1985)(citations omitted).

> When a term goes undefined in a statute, we give the term its ordinary meaning. *Taniguchi v.Kan Pac. Saipan, Ltd.,* 132 S. Ct. 1997, 2002, (2012). Accordingly, we give the words their ordinary dictionary meanings.

Lee v. Norfolk Southern Railway, 802 F.3d 626, 631 (4th Cir. 2015).

> It is a fundamental canon of statutory construction that the words of a statute must be read in their context and with a view to their place in the overall statutory scheme.

FDA v. Brown & Williamson Tobacco Corp., 529 U.S. 120, 133 (2000).

> [I]t is a commonplace of statutory construction that the specific governs the general. That is true where ***Congress has enacted a comprehensive scheme and has deliberately targeted specific problems with specific solutions.

RadLAX Gateway Hotel, LLC v. Amalgamated Bank, 566 U.S. 639, 645 (2012).

4. *ANALYSIS OF DEFINITIONS FOR GENERAL SERVICE INCANDESCENT LAMP AND GENERAL SERVICE LAMP*

EPCA's statutory definitions are set forth in 42 U.S.C. §6291. The definition of "general service lamp" is codified at 42 U.S.C. §6291(30)(BB):

> "(i) In general
>
> The term "general service lamp" includes--
> **(I)** general service incandescent lamps;
> **(II)** compact fluorescent lamps;
> **(III)** general service light-emitting diode (LED or OLED) lamps; and
> **(IV)** any other lamps that the Secretary determines are used to satisfy lighting applications traditionally served by general service incandescent lamps.
>
> (ii) Exclusions
>
> The term "general service lamp" does not include--
> **(I)** any lighting application or bulb shape described in any of subclauses (I) through (XXII) of subparagraph (D)(ii); or
> **(II)** any general service fluorescent lamp or incandescent reflector lamp."

For this discussion, it is important to note that clause (i)(IV) authorizes the Secretary to identify "other lamps . . . used to satisfy lighting applications traditionally served by general service incandescent lamps" and to add them to the definition of general service lamp. The other important fact to note is that Congress expressly detailed in clause (ii) of the general service lamp definition a laundry list of lamps and lamp applications the definition does "not include."

To understand the phrase "lamps . . . used to satisfy lighting applications traditionally served by general service incandescent lamps," it is important to understand the statutory definition of "GSIL." Congress defined that term at 42 U.S.C. §6291(30)(D) as follows:

"(i) In general

The term "general service incandescent lamp" means a standard incandescent or halogen type lamp that--

(I) is intended for general service applications;
(II) has a medium screw base;
(III) has a lumen range of not less than 310 lumens and not more than 2,600 lumens; and
(IV) is capable of being operated at a voltage range at least partially within 110 and 130 volts.

"(ii) Exclusions

The term "general service incandescent lamp" does not include the following incandescent lamps:

(I) An appliance lamp.
(II) A black light lamp.
(III) A bug lamp.
(IV) A colored lamp.
(V) An infrared lamp.
(VI) A left-hand thread lamp.
(VII) A marine lamp.
(VIII) A marine signal service lamp.
(IX) A mine service lamp.
(X) A plant light lamp.
(XI) A reflector lamp.
(XII) A rough service lamp.
(XIII) A shatter-resistant lamp (including a shatter-proof lamp and a shatter-protected lamp).
(XIV) A sign service lamp.
(XV) A silver bowl lamp.
(XVI) A showcase lamp.
(XVII) A 3-way incandescent lamp.
(XVIII) A traffic signal lamp.
(XIX) A vibration service lamp.
(XX) A G shape lamp (as defined in ANSI C78.20-2003 and C79.1-2002 with a diameter of 5 inches or more.
(XXI) A T shape lamp (as defined in ANSI C78.20-2003 and C79.1-2002) and that uses not more than 40 watts or has a length of more than 10 inches.
(XXII) A B, BA, CA, F, G16- 1/2, G-25, G30, S, or M-14 lamp (as defined in ANSI C79.1-2002 and ANSI C78.20-2003) of 40 watts or less."

A. *A "general service incandescent lamp" is a "standard incandescent or halogen type lamp"*

Congress defined the general service incandescent light bulb as the "standard incandescent or halogen type lamp" meeting certain other requirements. The standard incandescent light bulb is the most common type of light bulb known to consumers that dates back to Thomas Edison's day. Everyone knows what it looks like. Congress added that the Secretary could add other lamps to its definition of general service lamp *provided that* they were "used to satisfy lighting applications traditionally served by general service incandescent lamps."

Congress also specifically called out a number of other incandescent lamp types and expressly stated that they were "not included" in that definition. In previous comments in the rulemaking, NEMA observed that each of the incandescent lamp types "not included" in the definition share a common attribute: "none of these lamps are 'standard incandescent or halogen type lamps' --- they have notable design differences and aesthetic attributes (typically associated with a unique of different application) in contrast to the 'standard' incandescent light bulb."[48] DOE is well aware of what a "standard incandescent lamp" is; DOE has a web page devoted to describing the standard incandescent lamp for which there is a photograph used to depict that description. See https://energy.gov/energysaver/incandescent-lighting. DOE describes the "standard incandescent or pear-shaped A-19 lamp" on its web page as follows:

> STANDARD INCANDESCENT A-LINE LAMPS
>
> Commonly known as the screw-in "A"-type lamp that use a medium Edison (E-26) base, standard incandescent bulbs are the least efficient light source commonly found in homes. These lamps produce visible light by heating a tiny coil or filament of tungsten wire that glows when it is heated by an electrical current.

And consistent with every consumer's understanding of what this "A-type" lamp looks like, DOE displays this photograph of the standard incandescent lamp on the DOE web page (See Appendix C to these Comments):

In response to NEMA's comment, DOE apparently forgot that it really knew what the phrase "standard incandescent lamp" meant:

> EPCA does not define "standard" in the context of incandescent lamp. However, DOE considers it unlikely that the exemptions encompass solely lamps that are not "standard." Were that the case, the exemptions would be superfluous, because the

[48] EERE-2013-BT-STD-0051-0093, NEMA Comments at 3-4 (November 8, 2016).

> word "standard" in the definition of GSIL would on its own have ensured that none of those lamps are GSILs.

82 Fed.Reg. at 7289 (January 19, 2017).[49]

NEMA will explain later why DOE totally missed the congressional mark with this statement.[50] NEMA's point here is that the phrase "standard incandescent lamp" is important with respect to the Secretary's authority in 42 U.S.C. §6291(30(BB)(i)(IV) to identify "other lamps . . . used to satisfy lighting applications traditionally served by general service incandescent lamps." What are the lighting applications traditionally served by the standard incandescent lamp?

The standard incandescent lamp is used in general service lighting applications that require omnidirectional lighting for a certain range of light output, used in long-established household lamp sockets, most commonly the medium screw base, and with common household voltage. 42 U.S.C. §6291(30)(D)(i)-(iv). It is traditionally used in household desk and floor lighting fixtures, room ceiling fixtures, garage and entranceway fixtures, and certain types of wall fixtures where the A17 OR A19, bulb shape lamp is appropriate. As explained In Part One, the standard incandescent lamp is not used in every lighting fixture in these locations because of differences in fit, form and function that make specialty lamps the appropriate light source. For the same reason, many of the "other lamps" captured by DOE in its new GSL definition are not traditionally used where GSILs are used because they have a different fit, form, and function.

The term "traditionally" in the statutory phrase "lighting applications traditionally served by general service incandescent lamps" recognizes that the statute is referring to applications that represent a "long established" or "customary" practice for general service incandescent lamps. Merriam Webster Dictionary ("traditional"). NEMA respectfully submits that DOE paid lip service to and virtually ignored the meaning of this phrase and this term in January 2017 GSL Rule and IRL Rule.

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[49] In a footnote to this statement, DOE wrote, "DOE's understanding of the word "standard" in this context is discussed in section III.A.4.b." No such understanding of the word "standard" is offered up by DOE in section III.A.4.b of the Final Rule. See 82 Fed.Reg. at 7302-03 (January 19, 2017). What DOE attempts to defend in section III.A.4.b is its decision to insert the phrase "general lighting applications" in the definition of "general service lamp," a term that is used by Congress to describe metal halide lighting fixtures used in football stadiums, outdoor parking lots, large warehouses and retail spaces, which DOE inappropriately applied to lamps that are used to illuminate household closets, desks, bedrooms, and the like. Congress never used the phrase "general lighting applications" in the definitions of "GSIL" or "general service lamp." Given that Congress used the phrase to refer to football and baseball stadium lighting, there would have been no reason for Congress to apply the term to a common household light bulb. *See* discussion at pages 33-37, *supra*.

[50] See discussion at pages 45-49, *infra*. DOE erroneously conflated its authority to determine whether exemptions for certain incandescent lamps should be discontinued with its authority to identify "other lamps" that are "used to satisfy lighting applications traditionally served by GSILs."

DOE's Final Rules included specialty lamps in the definition of GSL that are not used to satisfy lighting applications traditionally served by GSILs. DOE ignored the fact that Congress' specific statutory reference point for "other lamps" that the Secretary might include in the definition of GSL was the standard incandescent light bulb. See pages 42-43, *supra*.

B. *Congress expressly stated in its definitions of general service lamp and general service incandescent lamp that certain lamps were "not included", but DOE ignored Congress*

Each of the definitions for "GSL" and "GSIL" recite a laundry list of specialty lamps that are "not include[d]" in the definitions of these lamps.

> "The term "general service lamp" does **not include** -- ***" 42 U.S.C. §6291(30)(BB)(ii)(emphasis supplied).
>
> "The term "general service incandescent lamp" does **not include** the following incandescent lamps: *** " 42 U.S.C. §6291(30)(D)(ii)(emphasis supplied).

Notably each of these sentences is preceded by the heading "Exclusions" and the terms "exclusion" and "not include" have identical meaning as NEMA previously explained in its comments in this rulemaking.[51] Consistent with the discussion above showing that certain specialty lamps are not "used to satisfy lighting applications traditionally served by general service incandescent lamps," Congress is legislatively saying here that they are definitively not so used. DOE ignored the congressional stop sign and decided to "include" in the definitions of GSL and GSIL some of the lamps identified in section 6295(30)(D)(ii) and (30)(BB)(ii) that Congress said were "not include[d]."

i. Exempt does not mean the same thing as "not included"

Congress' express declaration that specific types of lamps are "not included" in the definitions of "GSIL" and "GSL" is a formidable textual barrier to DOE declaring that these lamps are included in those definitions. So just as DOE went looking far afield elsewhere in the statute to incorporate the phrase "general lighting applications" and "provides overall illumination" in the definition of GSL, DOE went searching beyond the Secretary's authority in section 6291(30)(BB)(i)(IV) to include "other lamps" in the definition of GSL. DOE believed it found that authority in section 6295(*i*)(6)(A)(i)(II), the clause that authorizes the Secretary to determine whether "the exemptions for certain incandescent lamps should be maintained or discontinued based, in part, on exempted lamp sales collected by the Secretary from manufacturers." DOE arbitrarily and capriciously decided that "exemptions" meant the same thing as

[51] "Exclusion" in the heading of this clause means "The . . . state of being excluded." "Exclude" means: Deny access to a place, group, or privilege." *Oxford Dictionary of English* (2010). "Include means: comprise or contain as part of a whole; make part of a whole or set." *Oxford Dictionary of English* (2010). Here, Congress meant that these categories of specialty lamps are not "part of a whole or set" of GSILs or general service lamps. They have been denied a place in the statutory definitions. EERE-2013-BT-STD-0051-0093, NEMA Comments at 2-3 (November 8, 2016); EERE-2013-BT-STD-0051-0066, NEMA Comments at 18-19 (May 16, 2016).

"not include[d]".[52] The result was that DOE erroneously conflated the Secretary's authority to establish a regulatory obligation under section 6295(*i*)(6)(A)(i)(II) with a very different authority to define something under section 6291(30)(BB)(i)(IV).

DOE's construction of these terms suffers from numerous defects, all of which NEMA pointed out in its earlier comments:

A. "Not included" and "exemption" are words that have very different meanings.[53] It is significant that the two terms are located in two different parts of the statute. *Barnhart v. Sigmon Coal Co.,* 534 U.S. 438, 452 (2002)("[When] Congress includes particular language in one section of a statute but omits it in another section of the same Act, it is generally presumed that Congress acts intentionally and purposely in the disparate inclusion and exclusion.")[54] In the context of section 6291's definitions, the term "exemption" would make no sense. It is linguistically unnatural for Congress to "exempt" something from a definition; on the other hand, Congress would exclude (or "not include") something in a definition.

When faced with this same, precise question of statutory construction, courts have reached this same conclusion and rejected the interpretation that DOE adopted in the GSL Rule. Construing section 203(o) of the Portal-To-Portal Act, 29 U.S.C. §203(o), courts have held that an "exemption" does not arise in the context of a statutory definition, but an "exclusion" does arise in that context and declined to treat an exclusion as an exemption. In the Portal-to-Portal Act cases the courts have held that the statutory term "exclusion" in the definitions section of the Act does <u>not</u> refer to an "exemption."[55] This

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[52] 81 Fed.Reg. 71794, 71797 (October 18, 2016)(" DOE acknowledges that EPCA uses both the terms "exclusion" and "exempted"; however, in the context of GSLs and GSILs, DOE understands the term "exempted" to reference lamps listed under the "Exclusions" heading in the GSIL definition.").

[53] "Exemption" means: "The action of freeing or state of being free from an obligation or liability imposed on others: *** 'regulatory exemptions'." Oxford Dictionary of English (2010); "Freedom from a general duty or service; immunity from a general burden, tax, or charge." Black's Law Dictionary ("exemption"). "Exclusion" in the heading of this clause means "The . . . state of being excluded." "Exclude" means: Deny access to a place, group, or privilege." Oxford Dictionary of English (2010). "Include means: comprise or contain as part of a whole; make part of a whole or set." Oxford Dictionary of English (2010). Accord, Merriam-Webster Dictionary ("to take in or comprise as a part of a whole or group"). Here, Congress meant that these categories of specialty lamps are <u>not</u> "part of a whole or set" of either GSILs or GSLs. They have been denied a place in the statutory definitions.

[54] This is a case where *different* words are used. See *Vonage Holdings Corp. v. FCC,* 489 F.3d 1232, 1240 (D.C. Cir. 2007) ("[W]e have repeatedly held that where different terms are used in a single piece of legislation, the court must presume that Congress intended the terms to have different meanings."). When Congress inserts a word or policy in one section of a statute, it does not mean that an agency can borrow it to construe a different section to bolster its efforts at statutory construction that is not consistent with the structure and text of the act. See *Univ. of Tex. Southwestern Med. Ctr. v. Nassar*, 133 S.Ct. 2517, 2528-29 (2013).

[55] 29 U.S.C. §203, like 42 U.S.C. §6291, is a recitation of defined statutory terms and uses the phrases "does not include" and "exclude" to except that which is not part of the defined term. *Allen v. McWane Inc.*, 593 F.3d 449, 458 (5th Cir. 2010); *Sepulveda v. Allen Family Foods, Inc.* 591 F.3d 209, 214 & n.1 (4th Cir. 2009)("The employees

differential treatment of "exemptions" and "exclusions" in the Portal-to-Portal Act matches what Congress has done in EPCA and it is faithful to the natural and dictionary definitions of the two different terms. It is consistent with the proposition that "the words of a statute must be read in their context and with a view to their place in the overall statutory scheme." *FDA v. Brown & Williamson Tobacco Corp.*, 529 U.S. 120, 133 (2000).

This is a situation where it is appropriate to "rely on the principle of *noscitur a sociis*—a word is known by the company it keeps—to 'avoid ascribing to one word a meaning so broad that it is inconsistent with its accompanying words, thus giving unintended breadth to the Acts of Congress." *Yates v. United States*, 135 S. Ct. 1074, 1085 (2013). The terms "not included" and "exclusions" are known by the company they keep in section 6291 dealing with Definitions; the term "exemptions" is known by the company it keeps in section 6295 of the statute that creates legal obligations. This is entirely consistent with the dictionary definitions of these terms. See note 53, *supra*.[56]

Again, DOE's two Final Rules represent '[un]reasonable statutory interpretation [because DOE has failed to] account for both "the specific context in which . . . language is used" and "the broader context of the statute as a whole." *UARG, supra.* The Secretary's authority to include an "other lamp" in the definition of "GSL" rests upon a very different legal test, see 42 U.S.C. §6291(30)(BB)(i)(IV), than the Secretary's authority to discontinue an exemption from energy conservation standards. See 42 U.S.C. §6295(*i*)(6)(A)(i)(II). They are substantively <u>not</u> synonymous.

B. NEMA previously pointed out that among the lamp types that were "not included" in the definitions of "GSIL" and "GSLs" were lamps that were lamps not exempt from regulation under EPCA. These included incandescent reflector lamps, candelabra base incandescent lamps, intermediate base incandescent lamps and general service fluorescent lamps, for which Congress had previously established energy conservation standards in EPCA.[57] *If the two phrases were synonymous, one would*

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urge us to construe Section 203(o) narrowly in order to effectuate the remedial purposes of the FLSA. As they acknowledge, however, not all courts have applied this standard of interpretation to Section 203(o) because the section simply *defines* "Hours Worked" rather than exempting entire categories of employees from FLSA's protection."); *Hosler v. Smithfield Packing Co.*, 2010 U.S. Dist. LEXIS 101915 at *14 (E.D.N.C. 2010)("the court agrees with the greater weight of authority in finding that § 203(o) is not an exemption, but rather a definitional exclusion, appearing as it does in a section setting out definitions and entitled 'Definitions.' *Allen*, 593 F.3d at 458").

[56] The case law cited by DOE in the GSL Rule, 82 Fed.Reg. at 7285-86, is not in conflict with this conclusion. In *Pub. Investors Arbitration Bar Ass'n v. SEC*, 777 F.2d 1 (D.C. Cir. 2014) the court of appeals addressed the Freedom of Information Act's statutory "exemptions" from an obligation of disclosure. In *Friends of Animals v. Jewell*, 824 F.3d 1033 (D.C. Cir. 2016), the court of appeals addressed the Endangered Species Act's "hardship exemption" from the statutory obligation to obtain a permit and prohibitions on hunting. In neither case was the court addressing a statutory definition and the exclusion of items from that definition. DOE acknowledge[d] that in many contexts "exclusion" and "exemption" can refer to different concepts." 82 Fed.Reg at 7285 n.9. They clearly are two different concepts when used in the distinct contexts of definitions and obligations. See note 55, *supra*.

[57] EERE-2013-BT-STD-0051-0093, NEMA Comments at 9 (November 8, 2016).

not expect to find non-exempt lamps on a list of purportedly exempt lamps. Congress could not have intended to treat lamps that were *not* exempt from regulation under EPCA as "exempt."

DOE tried to side-step this obvious incongruity in the Final Rule with the following nonsensical statutory construction:

> A commenter also argued that DOE cannot discontinue exemptions for any set of lamps for which EPCA already imposes standards—or for lamps for which EPCA specifies future standards like the five lamp types addressed by subsection (*l*)(4). According to this commenter, such lamps are not "exempt" so there are no "exemptions" to discontinue. In considering this argument, DOE observes that to complete a concept of an "exemption" or of "exempting," it is necessary to say what the exemption is protecting from. In referring to "the exemptions," section 6295(*i*)(6)(A)(i)(II) does not provide that information, leaving an unavoidable ambiguity for DOE to reconcile. On the Commenter's view, "the exemptions" means exemptions from regulation under EPCA; thus if a type of lamp is subject to regulation of any kind under EPCA, it does not enjoy an 'exemption" that DOE may discontinue under subsection (i)(6)(A)(i). *However, DOE considers it more sensible to read "the exemptions" as meaning exemptions from being regulated as GSLs.*

82 Fed.Reg. at 7286 (January 19, 2017) (emphasis supplied).

NEMA respectfully submits that the DOE's construction of the statute's reference to "the exemptions" means "exemptions from being regulated as [general service lamps]," 82 Fed.Reg. at 7286 (January 19, 2017), is error and defies all logic. DOE is arguing here that when Congress asked the Secretary to determine whether "exemptions should be maintained or discontinued," Congress was not referring to exemptions from any DOE efficiency regulation but "exemptions" more specifically from "GSL" regulation. **But that is not what the statute says.** Sub-clause (i)(II) calls upon DOE to "determine whether-- ***II) the *exemptions for certain incandescent lamps* should be maintained or discontinued based, in part, on exempted lamp sales collected by the Secretary from manufacturers." 42 U.S.C. §6295(i)(6)(A) (i)(II)(emphasis supplied). Congress' direction to DOE in this sub-clause was specifically in reference to incandescent lamps that were not already subject to a regulatory obligation under EPCA. The word "certain" is a pronoun here and means "some, but not all." *Oxford English Dictionary* ("certain"). Congress' use of the word "certain" indicates that some incandescent lamps were exempt from EPCA regulation and others were not, and in fact that is the case: general service incandescent lamps, candelabra base incandescent lamps, intermediate base incandescent lamps, and incandescent reflector lamps are *not* exempt from a regulatory obligation under EPCA; certain other incandescent lamps were and are presently exempt from regulation under EPCA. DOE's argument is effectively asking a court to strike through the words "certain incandescent lamps" in this sub-clause. The Department has no authority to rewrite the statute in that fashion.

DOE's construction of "exemptions" in this clause is insensible. If DOE's construction of the statute was correct --- that Congress was referring only to exemptions from a general service lamp

standard that was still to be determined --- then the word "certain" is surplusage here, because *all* lamps are theoretically exempt from a regulation that is still to be determined.

DOE's authority to consider discontinuing exemptions for CFL and LED technology lamps is derivative from a separate subclause of this paragraph, 42 U.S.C. §6295(i)(6)(A)(ii)(I)("The rulemaking—shall not be limited to incandescent technologies"). Thus, for example, DOE was authorized to consider whether to discontinue or maintain exemptions for certain CFLs not already subject to a regulatory obligation under EPCA as compact fluorescent lamps.

The IRL Rule is doubly insensible. NEMA pointed out in its earlier comments that Congress stated twice in the same subparagraph that incandescent reflector lamps were "not included" in the definition of general service lamp. 42 U.S.C. §6291(30)(BB)(ii). See discussion at pages 59-60, *infra*. DOE's conclusion that incandescent reflector lamps are GSL is tantamount to driving through two stop lights on the way to a statutory construction train wreck.

ii. *Convenient unregulated alternative is just another subjective test adopted by DOE to justify broad agency discretion that the statute does not permit*

Nowhere does the phrase "convenient unregulated alternative" appear in the statute or in the text of the final rules' definitions; however, the phrase appears in the Final Rule and one cannot help but recognize it was created by DOE for the purpose of justifying wide discretion to redefine broadly the statutory term "GSL." 82 Fed.Reg at 7277 (January 19, 2017) ("As discussed in more detail, DOE is grounding the first of those decisions, namely which exemptions to maintain or discontinue, on an assessment of whether lamps within a given exemption would provide a convenient unregulated alternative to lamps that will be subject to energy conservation standards"). See also 82 Fed.Reg at 7287("DOE acknowledges that it has proposed a broad definition for GSL.")

Congress did not authorize the Secretary to define a GSL in terms of whether it was a "convenient unregulated alternative" to a regulated lamp. Congress identified three specific types of lamps that were GSLs and gave the Secretary limited authority to include "other lamps . . . used to satisfy lighting applications traditionally served by general service incandescent lamps." We have seen that authority is limited to identifying lamps that serve lighting applications traditionally served by the standard incandescent lamp.

Even if DOE was only claiming that its newly created "convenience" test was limited to determining whether to discontinue exemptions from regulation under section 6295(*i*)(6)(A)(i), because DOE has equated discontinuing exemptions with adding other lamps to the definition of GSL under section 6291(30)(BB)(i)(IV) and regulating them as such, DOE has inappropriately imported this hyper-elastic verbiage into its limited authority to add more lamps to the congressional definition of general service lamp.

Convenience is in the eye of the beholder, and it is a test nearly impossible to find common

meaning in almost any context.[58] It may be possible conveniently to screw a single medium screw base decorative "flame" (F) shape light bulb into a medium screw base socket in a bedroom ceiling used by an "A" shape GSIL, but that does not mean that consumer will ever find that the decorative flame lamp with a significantly lower light output satisfies lighting applications traditionally served by the "A" or pear-shape standard incandescent lamp with a much higher light output. In fact it is highly unlikely that this will ever happen. But DOE has lumped flame shape decorative lamps in with pear shape GSILs in a manner that Congress never intended.

"Convenient unregulated alternative" is a subjective, non-statutory catchphrase adopted by DOE to avoid the meaningful objective, dynamic sales analysis intended by Congress whether a consumer will actually or even likely switch from a more efficient general service lamp to a less efficient lamp and thereby undermine energy efficiency. In other subsections of this same statutory section dealing with discontinuing exemptions for incandescent lamps, Congress required a more objective, data-driven analysis vastly different than what DOE based its decision upon. *See* discussion at pages [50-58], *infra*. NEMA analyzes in the next section of these Comments each of the lamps that DOE believed represent a "potential risk of lamp switching," and like the phrase "convenient unregulated alternative," that analysis is barren as well. DOE relied on no data showing or suggesting actual switching with respect to the relevant lamp products it chose to regulate.

Lamps with radically different lumen output ranges (90 - 410 lumens) are not convenient substitutes for lamps with higher lumen output ranges (310-2600 lumens). Lamps with different lamp bases than the medium screw base lamp that DOE has included in the definition of GSL surely cannot be regarded as a "convenient" alternative. Decorative candelabra base lamps are not a convenient unregulated alternative to the common household lamp. They won't even screw into the same socket.

The Secretary should eschew these creative efforts to evade the statutory text enacted by Congress.

C. *DOE's "Sales" Approach to Lamp Exemptions Was Not Meaningful and Incorrect*

Setting aside DOE's erroneous conflation of its definitional task under section 6291(30)(BB)(i)(IV) and the statutory requirement to determine whether exemptions should be maintained or discontinued under section 6295(i)(6)(A)(i)(II), DOE's approach in the Final Rule to determining whether exemptions should be maintained or discontinued was legally flawed.

Section 6295(*i*)(6)(A)(i)(II) specifies that the Secretary is to make the exemption determination "based, in part, on exempted lamp sales collected by the Secretary from manufacturers." This sentence

[58] For example, A. Zangwill, Modern Electrodynamics at 50 (Cambridge Press, 2013):

"Maxwell's theory of electromagnetism forced a merger of two mature disciplines (electricity and magnetism) which had developed their own terminologies and practical systems of units. To design a common system of units, practitioners adhered to two principles: consistency and convenience. The first was easy to achieve. But, because convenience was in the eye of the beholder, it was inevitable that many different systems of electromagnetic units would be developed and put into use."

does not tell the Secretary how to use lamp sales data to make the determination; however other parts of the statute do and the GSL Final Rule ignores those other sections. *Util. Air Regulatory Group v. EPA*, 134 S. Ct. 2427, 2442 (2014)("A statutory 'provision that may seem ambiguous in isolation is often clarified by the remainder of the statutory scheme . . . because only one of the permissible meanings produces a substantive effect that is compatible with the rest of the law."). Congress spoke specifically to this issue by specifying a ***dynamic sales model*** that would provide the Secretary with a strong indication that lamp switching was occurring before discontinuing a lamp's exemption from regulation. See 42 U.S.C. §6295(*l*)(4). Elsewhere, Congress referred to requiring evidence that "sales of exempt incandescent lamps have increased significantly" in order to grant a petition to regulate an exempt incandescent lamp. Pub.L. 110-140, XXX Stat. YYY, ZZZ (December 19, 2007). The Congressional tests require a *dynamic* analysis that something has changed. DOE used a ***static*** approach that did not indicate any change. DOE ignored Congress' dynamic data-driven approach to show lamp switching. DOE's decision to ignore Congress' approach and rely on subjective catchphrases such as "convenient unregulated alternative" is "inconsisten[t] with the design and structure of the statute as a whole." *UARG, id.* The DOE's decision ignored "the commonplace canon of statutory construction that the specific governs the general . . . where Congress has enacted a comprehensive scheme and has deliberately targeted specific problems with specific solutions." *RadLAX Gateway, LLC v. Amalgamated Bank*, 566 U.S. 639, 645 (2012).

Instead of following the ***dynamic sales modeling*** approach described in the statute, DOE arbitrarily and subjectively examined only a ***static*** one-year (2015) sales number that it believed was "high" and declared that the lamp should lose its exemption because of that belief. 81 Fed.Reg. 71794, 71798- 801 (October 18, 2016)(NOPDDA) and 82 Fed.Reg. at 7291 (January 19, 2017)(Table III.1). DOE also purportedly assessed "lamp switching risk," but the Final Rule demonstrates that DOE only inferred "lamp switching risk" from subjectively determined "high sales" in one year. DOE cited no evidence of actual or likely switching by consumers, and common sense actually informs that DOE's subjective assessment is seriously flawed. Instead, DOE subjectively imposed a test nowhere found in the statute: if DOE "believes" a lamp might be a "convenient unregulated alternative" someday in the future, DOE will discontinue the exemption. There is nothing meaningful in this entirely subjective exercise and it is contrary to the scheme in the statute.

i. DOE erroneously decided that certain exempt incandescent lamps should have their exemption discontinued based on a static one-year sales number

Setting aside the three non-exempt, already regulated lamp types that DOE included in the definition of GSL, the other lamp types specifically "not included" in the definition of GSIL and GSL that DOE chose to discontinue exemptions for under the GSL Rule are these:

Lamp Type	Special regulatory status	Annual Sales Units
Vibration Service Incandescent	§6295(*l*)(4) – threshold for regulation triggered	7.0 million

Rough Service Incandescent	§6295(*l*)(4) – threshold for regulation triggered	10.9 million
Three-way Incandescent	§6295(*l*)(4) – threshold for regulation ***not*** triggered	32.65 million
Shatter-resistant Incandescent	§6295(*l*)(4) – threshold for regulation ***not*** triggered	689,000
Higher lumen Incandescent	§6295(*l*)(4) – threshold for regulation ***not*** triggered	4 million
CFL/LED Reflector lamp		30 million
T- shape lamp ≤ 40 watts (all technology)		9.75 million
B, BA, CA, F, G16–1/2, G25, G30, S, M–14 lamp ≤ 40 watts (all technology)		71.7 million
Three-way CFL/LED		Not cited
Shatter-resistant CFL/LED		Not cited
Higher lumen CFL/LED		Not cited

82 FR at 7291 (January 19, 2017)(Table III.1).

a) The Five Specialty Incandescent Lamp Types That Congress Required to be Tracked

In the EISA-2007, Congress gave specific direction to the Secretary about when and how it should regulate five types of exempt incandescent lamps in section 6295(*l*): Vibration Service Incandescent; Rough Service Incandescent; Three-way Incandescent; Shatter-resistant Incandescent; Higher lumen (2601lm – 3300lm) Incandescent. 42 U.S.C. §6295(*l*)(4).

Noticeably, these five lamp types have several things in common that distinguish them from all other specialty lamps "not include[d]" in the definition of GSIL. While they have unique features, components, and functions and applications not shared with GSILs,[59] they are the five lamp types that are very similar to the standard "pear shape" or A-line incandescent lamp, they have a medium screw base, they are designed to operate on nominal 120 voltage, and they provide omnidirectional light. Nevertheless, in addition to important functional and performance differences with the standard incandescent lamp (more robust filament to withstand vibration and rough service, silicone coating on bulb to prevent breakage of glass, multiple filaments to enable 3 lumen levels, and higher wattage and lumen level for brighter light than is normally desired by consumers in homes) there are other design features and performance differences too: a larger A21 bulb than the standard incandescent lamp because of the unique filament designs, longer life and lower lumen levels because the lamp is designed for longer life that is important to the commercial and industrial applications most of these lamps are primarily marketed for. The obstacles to potential switching are not as formidable as with other specialty incandescent lamps, and that is why Congress specifically asked they be tracked.

[59] This statement can be confirmed by reference to the specific congressional definitions for these lamps in 42 U.S.C. §6291(30)(X-AA).

3-way lamp rough service vibration service Shatter-resistant High-lumen (>2600-3300 lm)

TABLE 17

Special Design Incandescent Lamp Types – Medium Screw Base

Type	Wattage range	Lumen range (representative)	Voltage	Bulb shape	Life rating	Consumer acquisition cost
Vibration service	40W-60W	450 - 660	110-130V	A19, A21	2500 -14,000	$0.75 - $2.30
Rough service	60-100	380 - 1230	110-130V	A19, A21	1700 - 5000	$1.25 - $7.00
3-way	30-70-100	280-680-960 305-990-1300	110-130V	A21	1200-2500	$1.80-$1.90
3-way	50-100-150	580/1540/2120 615/1540/2155	110-130V	A21	1200 - 6500	$1.90-$4.50
Shatter	60 -100		110-130V	A17, A19		$1.80 – 2.00
High lumen	150 - 200	2640 - 2850	110-130V	A21	750 – 7000	$1.25 - $4.00
Primary applications		Commercial/industrial applications (high lumen; 3-way); residential lamp fixtures (3-way, high lumen); food service (shatter-resistant); industrial equipment (vibration service, rough service); refrigeration equipment (vibration service); worklights, ships, engine rooms, garage door openers, mines, elevators, public transport buses and trains and other industrial applications (rough service)				

Congress identified these five types of exempt specialty incandescent lamps for special regulatory treatment provided that a condition precedent occurred. The GSL Rule ignored Congress' very specific statutory pathway for the regulation of these five lamp types. Congress not only established specific circumstances when their exemption was lost, but also directed DOE to establish standards and failing that to adopt a lower wattage cap standard if DOE could not arrive at a justifiable standard. In the GSL Rule, DOE ignored Congress' specific ***dynamic*** change-in-sales-over-time approach for discontinuing the exemptions for three-way incandescent, shatter-resistant incandescent, and higher lumen incandescent. The change in sales thresholds represented Congress' determination of when a "lamp switching risk" occurred sufficient to justify regulation. **DOE has no discretion to invent its own subjective test different from Congress' objective test.** DOE should follow the specific pathway for regulation as Congress directed.[60] Congress required the Secretary to track the sales of these incandescent lamps annually. 42 U.S.C. §6295(*l*)(4). If their respective sales after 2010 exceeded a

[60] We note that DOE has recently agreed to follow through in this manner.

modeled sales projection based upon their respective historic sales trend line by 100%, the Secretary could initiate an accelerated rulemaking. *Id*. This analysis would reveal ***a dynamic change*** in sales over time that suggested these lamps were being switched in place of more efficient lamps. The Secretary has undertaken the required analysis of these incandescent lamps each year in accordance with the law.

If the sales of these lamps exceeded a projected trend line by 100%, Congress said the Secretary shall prescribe "*an* energy conservation standard" in an "accelerated" one year period. *See* Pub.L 110-140, 121 STAT. 1492, 1581-84; 42 U.S.C. §6295(*l*)(4)(emphasis supplied). Like any energy conservation standard, the Secretary is to select a standard that is technologically feasible and economically justified, and that standard does not have to be an efficacy standard. It can be a standard that imposes a maximum quantity of energy use. 42 U.S.C. §6291(6)(A). This conclusion is reinforced by other provisions of EISA 2007 respecting these same lamps. Congress specified that if the Secretary failed to enact an energy conservation standard for any of these five specialty incandescent lamps in a timely manner after the historic sales trend was exceeded for regulation was met, the Secretary had to impose a maximum 40 watt cap on vibration service, rough service, and shatter resistant lamps, a 95 watt cap on high lumen incandescent lamps above 2601 lumens, or that three-way incandescent lamps would have to meet the standards for halogen incandescent lamps.[61] Clearly, Congress said do not eliminate the product from the market with an energy conservation standard it cannot meet, but instead apply a wattage cap of 40 watts energy use and packaging restrictions of no more than one lamp per package and conspicuous labeling. Here Congress was effectively saying that if all else fails, a specific wattage cap will is justified for these five products. 42 U.S.C. §6295(l)(4)(D)ii), (E)(ii), (F)(ii), G(ii), (H)(ii).

During the course of this rulemaking, DOE determined that two of these five lamps --- vibration service and rough service incandescent lamps --- exceeded the trend line by 100% for the first time and therefore triggered the accelerated rulemaking. NEMA members observed that the increase in these two particular lamps had increased primarily in the deep discount retail sector. While DOE initiated an accelerated rulemaking procedure for vibration service lamps on April 8, 2016, if DOE failed to enact a standard for vibration service lamps by April 8, 2017, it must apply a 40 watt cap for vibration service lamps made after April 8, 2017. DOE never initiated the required accelerated rulemaking proceeding for rough service lamps; however, it is legally obligated to do so. With the Final Rule, DOE appears mistakenly to believe that it could ignore and abandon the specific regulatory process that Congress established for these lamps. 82 Fed.Reg. at 7288 (January 19, 2017). Nothing in the statute supports DOE's Final Rule treatment of these lamps, which renders subsection 6295(*l*)(4) entirely superfluous.[62] We note that DOE has recently agreed to follow the congressional pathway for regulation of these lamps.

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[61] 42 U.S.C. §6295(*l*)(4)(D)(ii), (E)(ii), (F)(ii), and (H)(ii).

[62] EERE-2013-BT-STD-0051-0093, NEMA Comments at 5-6 (November 8, 2016). *See also* EERE-2013-BT-STD-0051-0066, NEMA Comments at 46-47 (May 16, 2016)(data demonstrates sales of these lamps are declining).

Congress' regulatory treatment of these five exempt specialty incandescent lamps --- very different than regulating them as "GSLs" --- confirms that discontinuing an exemption for certain incandescent lamps is not the same as determining that "other lamps" are GSLs under section 6291(30)(BB)(i)(IV).[63]

DOE's treatment of these five specialty incandescent lamp types in the GSL Rule is "inconsisten[t] with the design and structure of the statute as a whole," *UARG, supra*. "Just as Congress' choice of words is presumed to be deliberate, so too are its structural choices." *Univ. of Tex. Southwestern Med. Ctr. v. Nassar, supra* at 2528-29. DOE was not entitled to ignore Congress' design and structure of the statute as a whole and Congress' structural choices for regulation of these incandescent lamps under EPCA.

b) Other specialty medium screw base lamps

i) T- shape Lamps at 40 watts or less

When DOE first proposed discontinuing the exemption for the tubular shape lamp it erroneously relied on the statutory phrase Congress used for football and baseball stadium lighting and made a conclusory claim that these lamps presented a lamp switching risk: "the lamps of the specific shapes discussed in this paragraph are frequently used in general lighting applications and thus DOE believes there is a significant risk for lamp switching." 81 Fed.Reg. at 71800 (October 18, 2016). How could DOE know this without any evidence whatsoever that the tubular shape lamp's sales were increasing because they were being switched for GSIL? In fact, sales of these light bulbs were decreasing. See Table 14, *supra*. In the GSL Rule, DOE presented no analysis of why this odd-shaped tubular lamp primarily sold in very low wattages (15 watts and 25 watts), and largely used in display cabinets and music stands, presented a lamp switching risk for the general service incandescent lamp or the general service lamp. See 82 Fed.Reg at 7293-94. DOE said this (*id*. at 7294):

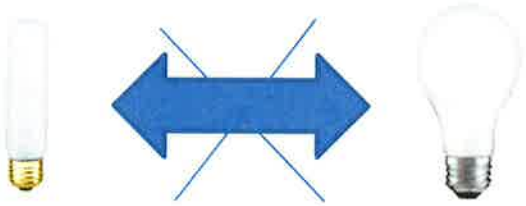
> In addition to the sizable sales of these T shape lamps, DOE determined that T shape lamps are capable of providing overall illumination and therefore have a high potential for lamp switching. Due to the high potential for lamp switching— reflected in part by high sales—DOE is discontinuing the exemption from the GSIL definition for T shape lamps of 40 W or less or length of 10 inches or more.

Even if there was legal merit to DOE's "overall illumination" test erroneously borrowed from Congress' regulation of football and baseball stadium lighting fixtures, it is logically and practically

[63] NEMA does not rule out that the Secretary could conclude, based on evidence they are being used in applications traditionally served by general service incandescent lamps, that that vibration service and rough service lamps are general service lamps under 42 U.S.C. §6291(30)(BB)(i)(IV) given the similar attributes of these lamps and evidence of switching. But Congress clearly did not mandate treating these specialty incandescent lamps as GSIL for standards purposes. They are different "type" of lamp given their special design characteristics.

impossible for any reasonable person to comprehend that a lamp that is primarily sold at 15 watts and 25 watts and whose exemption is capped at 40 watts, all with very low lumen levels at or under 410 lumens, provides "overall illumination" under anyone's subjective understanding of that term. Not only is DOE's legal test misplaced, but the test has been divorced from practical reality. There is no agency expertise in this judgment. Ordinary consumers would not agree with it. The lighting industry does not agree with it. Tellingly, there is no mention of Congress' test for including the tubular shape lamp in the definition of general service lamp: whether it is used in lighting applications traditionally served by general service incandescent lamps. This underscores what NEMA stated earlier: DOE re-wrote the statute so it could ignore the test that Congress assigned to this determination.

No explanation is given for the conclusory claim that there is a "high potential for lamp switching." There are no facts in the record on which DOE relied on that "switching" between the T-shape lamp and the standard incandescent lamp was occurring.



90-410 lumens 310 - 2600 lumens

One *cannot* infer from a subjective determination of "high sales" --- a static number --- that lamp switching is occurring or even likely to occur. A static number reveals no rational connection with "switching," which is a dynamic event. The sale of 9.75 million units per year may be static or trending up and down within a narrow range over time or even declining. DOE never assessed this question. In previous comments, NEMA asserted that DOE should look for evidence of "increasing sales" because that is the test that Congress specifically required in section 6295(*i*)(1)(E)(ii) before an exemption can be discontinued.[64] That approach is what "the design and structure of the statute as a whole," *UARG, supra*, would suggest to DOE in the absence of specific statutory guidance. 9.75 million units of annual sales represent only 1.6% of the estimated 600 million unit general service lamp (as defined by Congress) annual sales. For all we know, that is what they have always been. DOE presented no data that the relative share of these lamps was increasing at the expense of general service lamps. DOE has no data to support its "high potential for lamp switching" claim, particularly in the face of facts in the record that the tubular shape lamp won't satisfy the light output requirements for people using general service lamps.

The exemption for the T-shape lamp should be maintained in the absence of any evidence in the rulemaking record that would justify regulation.

[64] EERE-2013-BT-STD-0051-0093, NEMA Comments at 5 (November 8, 2016).

ii) *Medium screw base B, BA, CA, F, G25, G30, S, M–14 lamp ≤ 40 watts*

This is a basket of specialty or decorative lamp shapes that Congress included in the same sentence of lamp types that were "not included" in the definitions of GSIL and GSL. Some lamps have little or nothing in common with each other in this list other than the exemption is capped at 40 watts energy. DOE's explanation for its decision to discontinue the exemptions of these lamps recites the now-familiar refrains (82 Fed.Reg. at 7295):

> DOE recognizes that the lamps listed in clause (XXII) may each not be substituted for one another in existing fixtures. However, as discussed previously, DOE also considers the potential for lamp switching through the future use of different fixtures. There is the potential that inclusion of some but not all of the lamps in the group would shift the market to the lamp or lamps that remain exempt. Thus, due to the very high sales volume and risk of lamp switching of the lamp types, DOE is discontinuing exemptions for B, BA, CA, F, G16–1/2, G25, G30, S, M–14 lamp of 40 W or less.

As demonstrated below, DOE referred to no evidence of lamp switching between these odd shape lamps and the general service lamp. Nor did DOE rely on any evidence of "increasing sales" of a particular lamp --- the test that Congress specifically required in section 6295(*i*)(1)(E)(ii) before an exemption can be discontinued. The sales data that was in the record does not support a lamp switching claim; the data showed declining or at best flat sales for these lamps over time. DOE's entire conclusion rests upon a completely subjective, unsubstantiated claim of "potential."

DOE's statement above that it "considers the potential for lamp switching through the future use of different fixtures." It is true that fixtures in a home or building can change during a renovation and that may result in the use of a different type of lamp. It is also true that during new construction an architect or lighting designer can decide to use a type of fixture that influences the type of lamp that is used with that fixture, but that is not lamp switching of the type envisioned by Congress. Even under DOE's erroneous "convenient unregulated alternative" approach to regulation, this hardly qualifies as a "convenient" alternative. It is a very expensive way for the consumer to shave less than a dollar a month off an electric bill. In the vast, vast majority of cases, consumers are *not* going to be replacing floor and table lamp fixtures, outdoor lighting, recessed ceiling fixtures for directional lamps, or garage lighting fixtures with decorative candelabra fixtures containing these decorative lamps in any material way.

By DOE's measure, this basket of specialty lamps had an aggregate of 71.7 million annual unit sales in 2015. 82 Fed.Reg at 7291. DOE used this metric and again mistakenly applied its non-statutory test borrowed from baseball and football stadium lighting to conclude: "As indicated by the very high sales data of this category, DOE believes that these lamps are very common and can be used in *general lighting applications*." 82 Fed.Reg. at 7295 (emphasis supplied). Sales of these lamps were and are not increasing. See Table 12, *supra*.

iii) *The mushroom shape lamp (M-14)*

The so-called "very high" sales number masked a number of data points, and DOE's speculation about lamp switching risk fails here. NEMA pointed out that the M-14 --- "mushroom shape" --- lamp is no longer made or sold and enjoys zero sales. *Id.* at 7294-95. Even under DOE's liberal "potential for lamp switching" risk test, there cannot be any basis in the record for regulating this unusual lamp on the basis of a lamp switch risk when there is nothing to switch to.

The remaining lamps in this basket fall into three categories.

iv) *Candelabra base incandescent lamps (B,BA,CA,F,G16-1/2).*

The B (bullet shape), BA (bent tip), CA (candle), and F (flame) shape lamps are decorative lamps used primarily in candelabra style lighting fixtures and candleholder style fixtures. Which of these decorative lamp shapes a lighting fixture designer or consumer uses within this group is largely a matter of aesthetic preference. Sales of these lamps have not been increasing. See Table 11, *supra*. As with the other specialty incandescent lamps, DOE presented no data that the relative share of these lamps was increasing at the expense of general service lamps. This does not meet the statute's requirement for "increasing sales" of a particular lamp --- the test that Congress specifically required in section 6295(*i*)(1)(E)(ii) before an exemption can be discontinued upon a petition.

v) *The "S-shape" lamp*

The only specific reference in the GSL Rule to this shape lamp is that it is "typically used as sign lamps. [NEMA and LEDvance] noted that this is a commercial product that is unlikely to be used in residential applications or in general service lamp fixtures." 82 Fed.Reg. at 7294. See discussion of applications of "S" lamps in Part One, *supra* at pages 11-13. Ironically, DOE concluded that sign service lamps would remain exempt from regulation, so DOE contradicts itself that S lamps should be regulated. DOE cited approximately one million units of annual sales of sign service lamps in 2015. *Id.* at 7291. NEMA reported to DOE sales of approximately 5.1 million units of medium screw base S-shape lamps in 2015 that had been relatively stable over the past three years.[65] At 5.1 million annual unit sales, this represents less than one percent of the 600 million unit general service lamp (as defined by Congress) annual sales. But more importantly, the S-14 medium screw base lamp is made only in very low wattages (10-15 watts) with extremely low lumen output (60-200 lumens). Why DOE would want to consider for regulation this lamp that consumes so little energy, and why DOE would even think there is some risk of lamp switching with GSIL is a mystery. DOE pointed to no evidence of lamp switching. Facially, this is not the kind of data that engenders support for a lamp switching risk claim, and the fact that the exempt lamps' energy use is capped at 40 watts and lumen output is very low lamp switching is

[65] EERE-2013-BT-STD-0051-0093. NEMA Comments at 19 (November 8, 2016).

highly unlikely. As with the T-shape lamp and other odd shape lamps, DOE presented no data that the relative share of these lamps was increasing at the expense of general service lamps.

vi) *Conclusion*

An "agency must examine the relevant data and articulate a satisfactory explanation for its action including a rational connection between the facts found and the choice made." *Motor Vehicle Mfrs. Ass'n v. State Farm Mut. Auto. Ins. Co.*, 463 U.S. 29, 43 (1983). Here, there is no rational connection between a static subjectively-determined "high" sales figure (for lamps with falling sales that are comparatively low in volume compared to general service lamps) and dynamic lamp switching when other factors (e.g., low lumen output, smaller lamp base, and lack of presence in the market) would inform the agency that lamp switching is unlikely. The link between the facts found and the DOE's decision that there is a potential for switching among these very disparate lamps is broken. "An agency's decision is arbitrary and capricious if the agency relied on factors which Congress has not intended it to consider, entirely failed to consider an important aspect of the problem, offered an explanation for its decision that runs counter to the evidence before the agency, or is so implausible that it could not be ascribed to a difference in view or the product of agency expertise." *State Farm*, 463 U.S. at 43. Accord, *Dow AgroSciences LLC v. Nat'l Marine Fisheries Serv.*, 707 F.3d 462, 471 (4th Cir. 2012)(no rational connection between the agency's use of the 96-hour laboratory exposure assumption and field conditions.").

DOE's treatment of incandescent reflector lamps is likewise unauthorized

In October 2016, DOE surprised the rulemaking by proposing to revise the definitions of GSIL and GSL to include incandescent reflector lamps (IRL), among other lamps. 81 Fed.Reg. 71794, 71800 (October 16, 2016). Previously in the rulemaking, DOE had said it would not do this because IRL were already regulated under another subsection of the statute. 81 Fed.Reg. 14528, 14541 (March 17, 2016). When the final rules were issued, DOE states first in the GSL Rule that it was not including incandescent reflector lamps, and then in the IRL Rule issued simultaneously and published in the Federal Register right after the GSL Rule, DOE says it has changed its mind and IRL are included in the definition of GSL. The two rules actually cross-reference each other.

As NEMA pointed out in its comments to DOE in the rulemaking, Congress twice "excluded" the incandescent reflector lamp from the definition of "GSL" *in the same statutory clause*:

> In contrast to the Secretary's total lack of authority to include what is "not included" in the definition of ""GSIL," here the Secretary has limited authority to include "other lamps" provided that they are "used to satisfy lighting applications traditionally served by "GSILs." However, that authority is limited by the very next clause of this definition that states, without ambiguity, that the term "general service lamp" does "not include" (I) any of the lighting applications or bulb shapes that were excluded from the definition of "GSIL" or (ii) general service fluorescent lamps or incandescent reflector lamps. 42 U.S.C. §6291(30)(BB)(ii). It is significant that Congress specifically called out

> incandescent reflector lamps in the second sub-clause of this exclusion, because reflector lamps are also included in the list of lamp shapes for excluded in the first sub-clause of the exclusion. ***Congress said the same thing twice in a single statutory breath and could not have been clearer: Do not include or regulate incandescent reflector lamps within the definition of "general service lamps."*** *Why? Because they are already regulated under another part of the statute and Congress did not want the Secretary regulating them in this proceeding.*[66] (Emphasis supplied).

DOE has no convincing response to this legislative fact in its IRL Rule. DOE responded by saying it would be "especially odd in light of the authority that Congress provided DOE to assess whether to maintain or discontinue exemptions—a decision that, as DOE has explained, DOE believes was meant to focus on which exempted lamps would be substitutes for regulated GSLs." 82 Fed.Reg. at 7325 (January 19, 2017). Here, DOE is merely falling back on the elastic claim of authority that it expressed in the GSL Rule ("convenient unregulated alternative") and critiqued above. DOE's rationale --- claiming to be based on authority to assess whether to maintain or discontinue *exemptions* --- conveniently ignores the fact that incandescent reflector lamps, like some other lamps that are "not included," are not "exempt." They have been regulated under EPCA since 1992 and have been through rulemakings since that time requiring that they be more efficacious. Even under DOE's creative legal test, the incandescent reflector lamp is not a convenient *unregulated* alternative.[67]

Subpart B:
STATUTORY REQUIREMENTS FOR THIS RULEMAKING

The statutory requirements for this rulemaking are set forth in clauses (i) – (iv) of subparagraph (A) of 42 U.S.C. § 6295(i)(6):

> **(A) Rulemaking before January 1, 2014**
>
> (i) In general
>
> Not later than January 1, 2014, the Secretary shall initiate a rulemaking procedure to determine whether--
> (I) standards in effect for general service lamps should be amended to establish more stringent standards than the standards specified in paragraph (1)(A); and
> (II) the exemptions for certain incandescent lamps should be maintained or discontinued based, in part, on exempted lamp sales collected by the Secretary from manufacturers.
>
> (ii) Scope
>
> The rulemaking --
> (I) shall not be limited to incandescent lamp technologies; and

[66] EERE-2013-BT-STD-0051-0093. NEMA Comments at 3-4 (November 8, 2016).

[67] See also NEMA's discussion of the reflector lamp *supra* at page 27-28.

(II) shall include consideration of a minimum standard of 45 lumens per watt for general service lamps.

(iii) Amended standards

If the Secretary determines that the standards in effect for general service incandescent lamps should be amended, the Secretary shall publish a final rule not later than January 1, 2017, with an effective date that is not earlier than 3 years after the date on which the final rule is published.

(iv) Phased-in effective dates

The Secretary shall consider phased-in effective dates under this subparagraph after considering--

(I) the impact of any amendment on manufacturers, retiring and repurposing existing equipment, stranded investments, labor contracts, workers, and raw materials; and
(II) the time needed to work with retailers and lighting designers to revise sales and marketing strategies.

Clause (i) of §6295(*i*)(6)(A) is exclusively about incandescent lamp regulation

The first subclause (I) of clause (i) declared that the Secretary "shall . . .determine whether standards in effect for general service lamps should be amended to establish more stringent standards than the standards specified in paragraph (1)(A)." 42 U.S.C. §6295(*i*)(6)(A)(i)(I). With the two Final Rules published on January 19, 2017, the Secretary deferred this non-discretionary statutory requirement. 82 Fed.Reg. at 7277 ("This final rule does not determine whether DOE should impose or amend standards for any category of lamps, such as GSILs or GSLs."). Understanding exactly what this clause required of the Secretary is important for this rulemaking. It is about whether or not the standards for general service incandescent lamps that Congress established in EISA-2007 should be amended to be more stringent than Congress' 2007 standards for those same lamps.

It is indisputable that the only two "standards *in effect* for general service lamps" referenced in this clause are the energy conservation standards for (1) GSIL enacted by Congress in EISA 2007[68] and currently codified in DOE's rules at 10 C.F.R. §430.32(x)(1), and (2) the medium screw base compact fluorescent lamp (MBCFL) enacted by Congress in the Energy Policy Act of 2005[69] and currently codified in DOE's rules at 10 C.F.R. §430.32(u). Since the standards "in effect" for MBCFL were already "more stringent" than the standards specified in paragraph (1)(A) for GSILs, this statutory requirement can ***only*** refer to determining whether standards in effect for GSILs should be amended. The reference to "the standards specified in paragraph (1)(A)" refers only to general service *incandescent* lamp ("GSIL")

[68] Pub.L 110-140, §322(b), 121 STAT. 1492,1577 (EISA 2007) adopted by DOE at 10 C.F.R. §430.32(x)(1).

[69] 42 U.S.C. §6295(bb).

standards enacted by Congress in EISA 2007. Therefore, the *only* reasonable interpretation of this clause, after considering "the specific context in which . . . language is used" and "the structure of the statute as a whole," *UARG, supra,* is that Congress required the Secretary to determine whether standards in effect for GSILs --- established by Congress in EISA 2007 --- should be amended to establish more stringent standards than the standards for GSIL enacted by Congress in EISA 2007.

This construction of sub-clause (I) in clause (i) of §6295(*i*)(6)(A) is confirmed by a clause in subparagraph (B) of the same subsection that follows, which directed the Secretary to undertake a second, similar rulemaking after the year 2020 for these *same incandescent* lamps with respect to the *same* EISA-2007 energy conservation standards benchmark.

> Not later than January 1, 2020, the Secretary shall initiate a rulemaking procedure to determine whether--
>
> **(I)** standards in effect for general service ***incandescent*** lamps should be amended to reflect lumen ranges with more stringent maximum wattage than ***the standards specified in paragraph (1)(A);***

42 U.S.C. §6295(*i*)(6)(B)(i)(emphasis supplied). The clear import of this sub-clause in subparagraph (B) is that the Secretary is <u>*not*</u> required by the current rulemaking to amend standards for GSILs to make them more stringent than Congress' EISA 2007 standards, as DOE would have a chance to consider that exact same thing again in a later rulemaking after 2020. A subsidiary conclusion that necessarily follows from that conclusion is that Congress did not require or suggest a preference that DOE establish an energy conservation standard in this rulemaking that would eliminate GSILs from the market; otherwise, the above-cited sub-clause for the second rulemaking after 2020 would be entirely superfluous.[70]

Returning to clause (i) in subparagraph (A), the words chosen by Congress and their meaning are important too. Congress was asking DOE to determine by this rulemaking "whether" the GSIL standards in "paragraph (1)(A)" should or should not be amended. Congress was <u>*not*</u> telling the Secretary that he had to amend "the standards specified in paragraph (1)(A)," but the Secretary did have to "determine" --- one way or the other --- "whether" those standards should be amended or not.[71] The statutory term "whether" as in "whether standards in effect should be amended" demonstrates that the statute required the Secretary to make a determination among alternatives. The term "whether" means: "expressing a doubt or choice between alternatives." Oxford English Dictionary. *See also* Merriam Webster Dictionary (whether: "which one of the two").

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[70] Courts resist a construction of a statute "that would render superfluous an entire provision passed in proximity as part of the same Act. *** '[T]he canon against surplusage is strongest when an interpretation would render superfluous another part of the same statutory scheme.'" *Yates v. United States*, 135 S.Ct. 1074, 1085 (2015)(citations omitted). These two sub-clauses are part of the same statutory scheme and therefore "the canon against surplusage is strongest."

[71] *See* EERE-2013-BT-STD-0051-0015, NEMA Comments at 2-4 (February 7, 2014).

This dictionary definition of the term 'whether' is consistent with the "statute as a whole." Section 6295(m)(1) of EPCA, titled "Amendment of Standards", confirms that the Secretary "shall" choose between two alternatives when determining whether to amend an energy conservation standard: to amend or not to amend is the question.[72] Congressional direction to DOE to make a determination "whether" to amend or adopt energy conservation standards necessarily incorporates a requirement to determine that those standards cannot be amended if they are not economically justified, technologically feasible, or would not result in significant energy savings.[73]

The principle of statutory construction that "an agency must operate within the bounds of reasonable interpretation [a]nd reasonable statutory interpretation must account for both the specific context in which . . . language is used and the broader context of the statute as a whole," *UARG, supra,* leads to certain inescapable conclusions for this rulemaking and sub-clause (I) of section 6295(*i*)(6)(A)(i):

- The Secretary is required by Congress to decide whether to amend or not amend the GSIL standards enacted by Congress in EISA 2007.
- The Secretary is not obligated to amend those congressional standards and could decide not to amend Congress' GSIL standards (based on statutory criteria in EPCA).
- In deciding whether to amend or not amend GSIL standards in this rulemaking, the Secretary will assess the benefits and burdens of an amended energy conservation standard for GSIL standards as well as other statutory limits on amending energy conservation standards for these lamps.

DOE has not yet made the required statutory determinations, but it has indicated in the NODA that it is proceeding toward those determinations. 82 Fed.Reg. at 38616 (August 15, 2017).

Just as subclause (I) of clause (i) of section 6295((i)(6)(A) is exclusively about incandescent lamps, so too is subclause (II). In addition to the requirement that the Secretary determine whether or not to amend standards in effect for GSILs, clause (i) also required the Secretary to "determine whether --- **(II)** the exemptions for certain *incandescent* lamps should be maintained or discontinued based, in

[72] 42 U.S.C. §6295(m)(1): "Not later than 6 years after issuance of any final rule establishing or amending a standard, as required for a product under this part, the Secretary shall publish-- (A) a notice of the determination of the Secretary that standards for the product do not need to be amended, based on the criteria established under subsection (n)(2) of this section; or (B) a notice of proposed rulemaking including new proposed standards based on the criteria established under subsection (o) of this section and the procedures established under subsection (p) of this section."

[73] *See e.g.*: three instances where DOE determined that standards should not be amended or promulgated. 81 Fed.Reg. 90072 (December 13, 2016)(determining not to amend energy conservation standards for dishwashers); 80 Fed.Reg. 4042, 4043 (January 26, 2015)(determining not to amend energy conservation standards for incandescent reflector lamps); 80 Fed.Reg. 76355 (December 9, 2015)(determining not to adopt energy conservation standards for high intensity discharge lamps).

part, on exempted lamp sales collected by the Secretary from manufacturers." This sub-clause is purportedly the focus of the two Final Rules, although DOE did not specifically evaluate incandescent lamps as Congress required.

Making determinations about whether standards for general service incandescent lamps should be amended and whether standards for other exempt incandescent lamps that were not regulated should be established was the number one focus of this rulemaking --- at the top of the statutory list. There is a substantial practical reason why Congress was focused on incandescent lamps in 2007: that was the primary lamp technology on the market in the 2007, and that technology had just benefitted from an innovative improvement in efficiency.[74] Could something like that be achieved again with respect to incandescent technology? The statutory text is clear that Congress' intent was to determine whether incandescent lamps could or could not be made more efficient and therefore whether higher efficiency standards for incandescent lamps were economically warranted? Importantly, general service light-emitting diode lamps did not exist in 2007 and standards for those lamps could not have been Congress' primary focus and intent. No one knew in 2007 whether technology hurdles could be overcome to make general service LED lamps acceptable to consumers or, if those hurdles were overcome, would the general service LED lamp product be affordable to the consumer.

Clause (ii) of §6295(*i*)(6)(A) called on the Secretary to consider other lamp technologies too

The rulemaking --
(I) shall not be limited to incandescent lamp technologies;

This clause effectively authorized the Secretary to consider whether to amend the 2005 congressional standards for medium base compact fluorescent lamps, 42 U.S.C. §6295(bb),[75] another type of general service lamp, and it authorized the Secretary to consider whether to adopt standards for a general service LED lamp, assuming there was such a product available at the time of the rulemaking. It also enabled the Secretary to consider whether certain other fluorescent or LED lamp types that were exempt from regulation should have those exemptions maintained or discontinued. If exemptions were to be discontinued, it would be up to DOE to determine whether standards for those lamps would be economically justified, technologically feasible, and generate significant energy savings. Thus, the Secretary was authorized to undertake the same type of assessments and make the same determinations with respect to compact fluorescent technology lamps and LED technology lamps that DOE would make separately for exempt incandescent lamps.

Additionally, Congress did authorize the Secretary to consider a minimum standard --- 45

[74] EERE-2013-BT-STD-0051-0066, NEMA Comments at 11 (May 16, 2016).

[75] DOE recognized this in the NOPR published in this rulemaking. 81 FR 14528, 14537 (March 17, 2016) ("Additionally, this rulemaking satisfies the requirements under 42 U.S.C 6295(m)(1) for DOE to review the existing standards for MBCFLs, as CFLs are included in the definition of GSL.").

lumens per watt --- applicable to all general service lamps.

> The rulemaking –
> ***
> (II) shall include consideration of a minimum standard of 45 lumens per watt for general service lamps.

As explained below, the Secretary is not obligated to adopt such a standard, but if he decided to do so he would have to determine that it was economically justified and technologically feasible for each type of general service lamp.

Clause (iii) of §6295(*i*)(6)(A) is conditional on the Secretary completing clause (i)(I)

> (iii) Amended standards
>
> If the Secretary determines that the standards in effect for general service incandescent lamps should be amended, the Secretary shall publish a final rule not later than January 1, 2017, with an effective date that is not earlier than 3 years after the date on which the final rule is published.

The only requirement articulated in this clause is that the Secretary shall publish a final rule not later than January 1, 2017, with an effective date that is not earlier than 3 years after the date on which the final rule is published, "*if the Secretary determines that the standards in effect for general service incandescent lamps should be amended*." The phrase "determines that the standards in effect for general service incandescent lamps should be amended" is a direct reference to the required determination in subclause (I) of clause (i) discussed above. Since the Secretary has not yet made the determination to amend standards for GSILs, there is no obligation under clause (iii) to publish an amended standard by January 1, 2017 until a determination to amend the GSIL standards is made. If the Secretary determines *not* to amend the GSIL standards, there would no need or obligation to publish an amended standard by a certain date with an effective date that is not earlier than 3 years afterward. In that scenario, Congress' EISA-2007 standards for GSIL would remain intact for a period of time until the next rulemaking required by Congress in 42 U.S.C. §6295(*i*)(6)(B) is completed. In that circumstance, the January 1, 2017 deadline for publication has no legal or other significance.

Clause (iv) of §6295 (*i*)(6)(A) is conditional on the Secretary completing clauses (i) and (ii)

> (iv) Phased-in effective dates
>
> The Secretary shall consider phased-in effective dates under this subparagraph after considering--
> (I) the impact of any amendment on manufacturers, retiring and repurposing existing

> equipment, stranded investments, labor contracts, workers, and raw materials; and
> (II) the time needed to work with retailers and lighting designers to revise sales and marketing strategies.

This clause did not establish a mandate to establish phased-in effective dates, but it did require the Secretary to "consider phased-in effective dates." Consideration of phased-in effective dates, however, is entirely dependent upon the determination to amend or adopt standards for any type of general service lamp or other exempt lamp whose exemption was being discontinued.

CONGRESS AUTHORIZED DOE TO CONSIDER WHETHER STANDARDS FOR ANY SPECIALTY LAMPS EXEMPT FROM REGULATION ARE APPROPRIATE

When Congress authorized the Secretary to "determine whether the exemptions for certain incandescent lamps should be maintained or discontinued", 42 U.S.C. §6295 (*i*)(6)(A)(i)(II), and declared that the rulemaking "shall not be limited to incandescent lamp technologies," 42 U.S.C. §6295 (*i*)(6)(A)(ii)(I), the Secretary was granted authority to make determinations whether or not to promulgate energy conservation standards for types of incandescent, fluorescent, or LED lamps that were not yet regulated under EPCA. This effectively authorized the Secretary to consider whether to regulate a general service LED lamp, and whether to regulate types of special purpose lamps, whether incandescent, fluorescent, or LED. This authority parallels exactly what Congress did in the Energy Independence and Security Act of 2007 (EISA-2007) in enacting energy conservation standards for general service incandescent lamps, and separate energy conservation standards for specialty incandescent lamps such as candelabra base incandescent lamps and intermediate base incandescent lamps.

As NEMA Comments have previously articulated, this exercise is entirely different than the definitional determination of whether an "other lamp" is used to satisfy lighting applications traditionally served by general service incandescent lamps. It is an exercise about whether energy conservation standards for different types of specialty lamps ought to be established.

A FINAL RULE IN COMPLIANCE WITH THE STATUTE

This is a rulemaking proceeding that is required by Congress. 42 U.S.C. §6295(i)(6)(A). It was not discretionary with the Secretary of Energy. NEMA calls upon the Secretary to review the GSL Rule and the IRL Rule concerning definitions of types of lamps and general service lamps and continue the rulemaking in a manner consistent with Congress' intent. The statute requires the Secretary to make certain determinations or at least "consider" certain other things, each of which is prefaced by the word "shall", although some actions are conditional and others are dependent upon another. The Secretary did initiate this rulemaking procedure before January 1, 2014, but for reasons that we have explained previously DOE has not completed other aspects of the rulemaking in conformity with the statute. The NODA indicates that DOE is now undertaking to complete the rulemaking. We address each part of §6295(i)(6)(A) and provide our recommendation to bring DOE into compliance with this part of the statute.

A. Determine whether standards in effect for general service lamps should be amended to establish more stringent standards than the standards specified in paragraph (1)(A)

As explained above, the only two "standards in effect" for GSLs are the energy conservation standards for (i) the GSIL standards enacted by Congress in EISA 2007 and currently codified in DOE's rules at 10 C.F.R. §430.32(x)(1), and (ii) the medium screw base compact fluorescent lamp (CFL) enacted by Congress in the Energy Policy Act of 2005 and currently codified in DOE's rules at 10 C.F.R. §430.32(u). The reference to "the standards specified in paragraph (1)(A)" is a reference only to GSIL standards. Since the standards in effect for CFL were already "more stringent" than the standards specified in paragraph (1)(A) for GSILs, this statutory requirement could only refer to determining whether standards in effect for GSILs should be amended. Our comments will address CFLs under (C) below.

GENERAL SERVICE INCANDESCENT LAMPS. NEMA previously explained in detail that the only two technologically feasible options for amending standards for GSILs at 10 C.F.R. §430.32(x)(1) were (i) requiring lamp manufacturers to incorporate halogen IR (infrared) technology in the GSIL; or (ii) requiring lamp manufacturers to reduce wattage slightly to save a couple of watts energy. In each case, NEMA detailed why these two technology options could not be economically justified. EERE-2013-BT-STD-0051-0066, NEMA Comments at 50-56 (May 16, 2016). We direct DOE to our previous comments and the conclusion, "The Secretary can easily determine in this rulemaking that amending the energy conservation standards for GSILs in 10 CFR 430.32(x)(1) in this rulemaking cannot be economically justified." *Id* at 56. When compared to the standard halogen incandescent lamp currently on the market, the halogen IR incandescent lamp provides only 7 watts reduction in energy use for one lumen level of the lamp, and a 2 watt *increase* in energy use for another lumen level. Consumers will not buy this costly halogen IR product because the price is too high, and consumers will not see a payback from energy savings unless the price falls below manufacturer cost.

Our summary of the detailed points why halogen IR technology cannot be economically justified observed:

> It is inconceivable that an energy conservation standard for GSILs based on halogen IR technology will ever be economically justified. It makes no sense for the consumer; it makes no sense for the manufacturer; it makes no sense for the factory worker; it makes no sense for the nation.

NEMA's summary of why reducing wattage in the current halogen lamp makes no economic sense noted that reducing wattage sacrifices the rated lamp life by approximately 12.5% per watt. This results in a negative lifecycle cost to the consumer because they would be forced to purchase replacement lamps at a faster interval. On top of these concerns is that regulatory action would force the closure of domestic manufacturing plants and impact employment; eliminate a product that has a better economic profile in lighting applications where lamps are not "on" much; eliminate a product

that creates a competitive price point for other GSLs such as CFLs and LEDs; and avoids a potential and very significant product shortage problem if incandescent lamps are eliminated from the market on January 1, 2020. *Id.* at 65-67. DOE's own evaluation indicated that the lighting industry would need to produce 400 million general service LEDs for a one year period to replace the 400 million GSILs that could no longer be sold if a 45 lumen per watt standard was applied. By adding incandescent reflector lamps to the definition of GSL, DOE compounded this problem by an additional 100 million units. Producing 300-500 million units or more of LED lamps for one year is not going to happen, because there is no rational economic reason why manufacturers would establish that additional aggregate lamp manufacturing capacity for such a short period of time. On these facts and the other facts outlined in NEMA's May 16, 2016 comments at pages 50-56, the Secretary should make the determination under 42 U.S.C. §6295(i)(6)(A)(i)(I) that standards for general service incandescent lamps should not be amended.

Under these circumstances, NEMA noted (*id.* at 67):

> It is consistent with DOE's long-established policy to consider non-regulatory strategies in lieu of regulatory actions. The Department's 1996 Process Rule, 10 CFR Pt. 430, Subpt. C, App. A, states in Section 12(b):
>
> > (b) DOE believes that non-regulatory approaches are valuable complements to the standards program. In particular, DOE will consider pursuing voluntary programs where it appears that highly efficient products can obtain a significant market share but less efficient products cannot be eliminated altogether because, for instance, of unacceptable adverse impacts on a significant subgroup of consumers. In making this assessment, the Department will consider the success more efficient designs have had in the market, their acceptance to date, and their potential market penetration.
>
> This rulemaking provides the Secretary with an opportunity to constructively apply this policy here because it "appears that highly efficient products can obtain a significant market share but less efficient products cannot be eliminated altogether because, for instance, of unacceptable adverse impacts on a significant subgroup of consumers," along with significant adverse impacts on domestic manufacturers and domestic employees. The information presented in Part Two, Sections III and IV represent a "demonstration of the strong commitment of manufacturers, distribution channels, utilities or others to such voluntary efficiency improvements" which the Process Rule states "will be used in assessing the likely incremental impacts of establishing or revising standards, in assessing appropriate effective dates for new or revised standards and in considering DOE support of non-regulatory initiatives." *Id.* at Section 12(a).[76]

[76] We direct the DOE's attention to a recent ENERGY STAR publication documenting how non-regulatory approaches are advancing the market transformation to LED lighting. U.S. EPA, *The Light Bulb Revolution* (October 2017). www.energystar.gov/bulbrevolution

NEMA provided data and pointed to supporting DOE data that the market was achieving Congress' energy saving goals on its own as the general service LED was showing rapid consumer adoption and projections for general service LED penetration of lamp sockets would make the LED lamp the dominant lamp technology in the market:

> Between now and 2020 it is probable and entirely foreseeable that, without any DOE regulation, general service halogen incandescent lamps will likely represent less than 40% of lamps in general service lamp sockets. The other 60% or more of lamp sockets will largely be comprised of general service LED lamps and a smaller percentage of CFLs as consumer and manufacturer interest in the CFL wanes almost entirely. With that mix of general service lamp products in general service lamp sockets, the energy consumption of general service lamps in sockets is less than if a 45 lumen per watt lamp was in every general service lamp socket. At that point, the energy "savings" that Congress said would avoid the Backstop provision in 42 U.S.C. §6295(i)(6)(A)(v) is achieved.

Id. at 65 and 97-103. The International Association of Lighting Designers (IALD) made a similar comment during the rulemaking:

> The IALD questions whether the proposed regulations calling for a new lighting standard are necessary primarily because the lighting marketplace is meeting the challenge of reduced energy use and increased efficiency standards.
>
> The marketplace, particularly for residential lighting, is rapidly moving toward the use of LED lights. One can argue the DOE agrees with this statement. A recent DOE news release stated, "the proposal reflects current market trends in lighting technologies." The DOE points out that General Electric is discontinuing the manufacture of coiled CFLs and further emphasizes the actions of the marketplace stating, "The National Electrical Manufacturers Association (NEMA) reported that shipments of LED lights jumped 237 percent the third quarter of 2015, compared to the same period in 2014." These examples illustrate the direction the marketplace is going without the benefits of hundreds of pages of complex regulatory language.
>
> Moreover, recent evidence from the CBECS (Commercial Buildings Energy Consumption Survey), a DOE initiative, shows that the amount of electricity used for lighting in commercial buildings in the United States decreased by 46% from 2003 to 2012, a trend that is continuing as the market penetration of solid-state lighting increases.

EERE-2013-BT-STD-0051-0101, Comments of David Ghatan, IALD at 1 (April 14, 2016).

None of these NEMA comments were addressed by DOE, except DOE's acknowledgment that

> manufacturers may face a difficult transition ***if*** required to comply with a 45 lm/W standard. Manufacturers have voiced concern regarding the loss of domestic manufacturing jobs, the stranding of inventory, the ability to meet the demand for all general service lamps with lamps using LED technology, and the burden associated with testing and certifying compliance for all general service lamps in DOE's Compliance Certification Management System (CCMS).

82 Fed.Reg. at 7317 (January 19, 2017)(emphasis supplied).

In a subsequent comment in this rulemaking, NEMA observed that

> Nothing in the NOPDDA indicates that the DOE has considered "the alternative of not regulating" the non-exempt or excluded lamps in the manner that it is proposing to regulate in this rulemaking. Yet this is a fundamental requirement of Executive Order 12866 (September 30, 1993)("agencies should assess all costs and benefits of available regulatory alternatives, including the alternative of not regulating.")

DOE's policy as expressed in the Process Rule and the White House policy expressed in Executive Order 12866, together with the facts that an energy conservation standard eliminating GSILs from the market would negatively impact consumers and manufacturers all reasonably justify that the Secretary should determine that energy conservation standards for GSILs should not be amended.[77]

B. Determine whether the exemptions for certain incandescent lamps should be maintained or discontinued based, in part, on exempted lamp sales collected by the Secretary from manufacturers.

This determination, as NEMA has explained above, refers to those "certain incandescent lamps" that are currently not regulated under EPCA. Accordingly, the statute is not referring to GSIL, candelabra base incandescent lamps, intermediate base incandescent lamps, and incandescent reflector lamps to which Congress and DOE has applied energy conservation standards and are already regulated under EPCA.

There are two categories of incandescent lamps to which this determination applies: (i) the five types of specialty incandescent lamps for which a distinct regulatory process is established in section 6295(*l*)(4), and (ii) other types of specialty incandescent lamps .

The five types of specialty incandescent lamps. Congress gave specific direction to the Secretary about when and how it should regulate these lamps. As noted above, the statutory threshold for vibration service and rough service incandescent lamps for an accelerated rulemaking has been

[77] It should be noted that Congress authorized and directed the Secretary to consider this issue again after 2020. 42 U.S.C. §6295(*i*)(6)(B)(i)(I).

surpassed. NEMA's recommendation to the Secretary is that the Secretary adopt the standard imposed by Congress in the statute. In the case of the vibration service incandescent lamp:

> effective beginning 1 year after the date of the issuance of the finding [April 8, 2017] under clause (i)(I), the Secretary shall require vibration service lamps to--
>
> **(I)** have a maximum 40-watt limitation; and
>
> **(II)** be sold at retail only in a package containing 1 lamp.

42 U.S.C. §6295(I)(4)(E)(ii).

> In the case of the rough service incandescent lamp:
>
> effective beginning 1 year after the date of the issuance of the finding under clause (i)(I), the Secretary shall require rough service lamps to--
>
> **(I)** have a shatter-proof coating or equivalent technology that is compliant with NSF/ANSI 51 and is designed to contain the glass if the glass envelope of the lamp is broken and to provide effective containment over the life of the lamp;
>
> **(II)** have a maximum 40-watt limitation; and
>
> **(III)** be sold at retail only in a package containing 1 lamp.

42 U.S.C. §6295(I)(4)(D)(ii).

As for the other three types of specialty incandescent lamps that Congress explicitly addressed in section 6295(*I*)(4), DOE should continue to monitor the sales of these lamps in the manner provided by Congress in the statute and act as Congress directed. Sales of these other lamps are declining too.

Multifaceted-reflector (MR) halogen incandescent lamps

The MR halogen incandescent lamp is currently exempt from regulation. It is not part of the definition of incandescent reflector lamp and it is not regulated as an IRL. It is a reflector lamp "not included" in the definition of GSIL. 42 U.S.C. §6291(30)(D)(ii)(XI). In the GSL definition Final Rule, DOE included this lamp among "GSLs" based on its erroneous, expansive reading of its statutory authority. As a GSL, this lamp would be eliminated from the market under a 45 lumen per watt energy conservation standard that DOE mistakenly believed would be effective in 2020 if DOE made no determination to amend GSIL standards.

The MR lamp is a specialty reflector lamp, primarily used in commercial retail and museum display applications and in equipment. To a much lesser extent it has come to be used in residential applications. In commercial applications, there is a shift from halogen to LED technology, primarily at

lower lumen levels where there are no technical obstacles to LED adoption. The form factor of an MR shaped directional lamp is extremely small. Consequently, there is little room to place electronic driver components within this lamp. More importantly, there is little room to dissipate the heat from electronic driver components. Both technical problems (space availability and heat dissipation) become more and more challenging as the lumen output, and therefore wattage, increases causing internal lamp temperature to climb higher and higher. High internal lamp temperatures produce very short life electronics. You cannot have both very high electronic operating temperatures and a very long lamp life. There is no apparent technical solution to this problem at this time, other than designing a completely different LED lighting fixture for the same application which would require a fixture change. For this reason, LED MR replacement lamps are largely limited to lower lumen lamps.

In previous comments, NEMA explained that there are opportunities for energy savings here with a more modest energy conservation standard that placed a less burdensome wattage cap on this specialty lamp could be economically justified that resulted in energy savings. There is a regulatory parallel here with what Congress undertook with respect to two other specialty lamps: the candelabra base incandescent lamp and the intermediate base incandescent lamp. NEMA proposed a 50 watt wattage cap. This would eliminate some higher wattage versions of this lamp, namely 71/75 watt lamps and we continue to recommend that approach. EERE-2013-BT-STD-0051-0066, NEMA Comments at 56 (May 16, 2016)("MR incandescent lamps (designated MR11, MR14, MR16, and MR20) shall not exceed 50 rated watts.").

Other exempt incandescent lamps

In the Final Rule DOE purportedly determined that a number of other incandescent lamps should have their exemptions discontinued. These include:

> **(XIII)** A shatter-resistant lamp (including a shatter-proof lamp and a shatter-protected lamp).
> **(XVII)** A 3-way incandescent lamp.
> **(XXI)** A T shape lamp (as defined in ANSI C78.20-2003 and C79.1-2002) and that uses not more than 40 watts or has a length of more than 10 inches.
> **(XXII)** A B, BA, CA, F, G16-1/2, G-25, G30, S, or M-14 lamp (as defined in ANSI C79.1-2002 and ANSI C78.20-2003) of 40 watts or less.

In addition to these incandescent lamps, DOE also determined that incandescent lamps with a lumen output greater than 2600 lumens and up to and including 3300 lumens (higher lumen incandescent lamps) should lose their exemption from regulation as well.

The shatter-resistant lamp, the 3-way incandescent lamp, and the higher lumen incandescent lamp are each subject to the special statutory provisions that govern vibration service and rough service incandescent lamps. The specific regulatory trigger for regulation established by Congress has *not* been triggered, and DOE should only consider these lamps for regulation when the Congressional threshold for regulation has occurred. To determine otherwise would render section 6295(*l*) superfluous.

With respect to the other odd-bulb shape lamps (T, B, BA, CA, F, G16- 1/2, G-25, G30, S, or M-14 lamps), NEMA points out that each of these products are already low-wattage products as a matter of law because their wattage cannot exceed 40 watts if they are entitled to an exemption. These lamps are not manufactured at higher wattages. NEMA's view is that there is in fact a *de jure* energy conservation standard for these odd-bulb shape lamps by virtue of the fact that Congress defined their exemption in terms of a wattage cap. Under that circumstance, it would not be inappropriate to recognize that wattage cap as an energy conservation standard in the DOE regulations. Accordingly, NEMA recommends an energy conservation standard for these lamps in a manner aligned with congressional intent:

(v) Each B, BA, CA, F, G16-1/2, G-25, G30, S, M-14 shape incandescent lamp, as defined in ANSI C79.1-2002, or T shape incandescent lamp, as defined in ANSI C78.20, shall not exceed 40 rated watts.

C. The rulemaking shall not be limited to incandescent lamp technologies

This provision authorized the Secretary to determine whether or not standards for compact fluorescent lamps should be made more stringent, and to determine whether exemptions for compact fluorescent lamps (CFLs) should be maintained or discontinued. It further authorized the Secretary to determine whether or not standards for general service LEDs should be established (by discontinuing their current exemption from regulation). NEMA addresses CFLs first.

Compact fluorescent lamps. Previously in this rulemaking, NEMA recommended that "DOE maintain the current energy conservation standard for the medium base CFL, but go no higher than EL-2 if that standard is economically justified. Consistent with our comments elsewhere in this submission, we expect the market will likely reduce the presence of this lamp in the market to near-zero at some point." EERE-2013-BT-STD-0051-0066, NEMA Comments at 37 (May 16, 2016).

In the March 2016 Notice of Proposed Rulemaking (NOPR), DOE was proposing an energy conservation standard for the CFL that the CFL could never meet; in brief, DOE was proposing to eliminate the CFL from the market by regulation. Another proposed efficiency level that DOE had studied --- EL 2 --- was a standard that an improved CFL could meet; however, NEMA was skeptical that any manufacturer would consider investing making such a lamp because consumer demand was declining rapidly and demand was expected to approach zero in the foreseeable future. Manufacturers and retailers were already disinvesting in the CFL. EERE-2013-BT-STD-0051-0066, NEMA Comments at 57-61 (May 16, 2016). DOE might also consider adopting the ENERGY STAR specification version 4.3 for compact fluorescent lamps. This is a more stringent standard than the current statutory energy conservation standard for MBCFL. There are CFLs on the market that meet this specification, and there are CFLs on the market that do not meet this specification. To the extent that CFLs remain in the market in the future, this would ensure that the top rated CFLs in terms of efficiency are available.

DOE was also proposing an energy conservation standard for a non-integrated compact fluorescent lamp. In its previous comments, NEMA advised DOE that it "disagrees with the DOE's perceived need to establish standards for Pin-Based compact fluorescent lamps. This is a relatively small product area used almost exclusively in commercial lighting applications. As such, this is not a growing product area. It is a declining product area." EERE-2013-BT-STD-0051-0066, NEMA Comments at 83 (May 16, 2016). NEMA further advised, "[T]he lighting industry has already improved screw-based and pin-based compact fluorescent lamps technology over the past 20 years and it is near the limits of the highest practical efficiency available from this technology. No further advancements in efficiency are expected in the CFL product area." *Id.* at 85.

Further investment in this product line will not be forthcoming and more stringent energy conservation standards are a waste of government and private resources.

Light-emitting diode (LED) lamps.

(i) General service (A-line) LED lamps.

This is the LED technology version of the standard incandescent light bulb that Congress expressly identified in the definition of "GSL." 42 U.S.C. §6291(30)(BB)(i)(III). While currently exempt from regulation, as NEMA's previous comments in this rulemaking document, Congress made the lamp a covered product by specifically calling upon to DOE to adopt standards for this lamp that could be economically justified and were technologically feasible. 42 U.S.C. §6295(*i*)(6)(A)(ii)(I).

In the March 2016 NOPR, DOE proposed an efficacy curve that would be applicable to the general service LED. NEMA was supportive of this approach, although NEMA pointed out that the efficacy curve presented technical problems at the lower lumen output levels that DOE had not previously recognized.[78] NEMA recommended a slightly different efficacy curve to address the technical issue at the lower lamp lumen levels. NEMA understands that DOE will be submitting a notice of proposed rule in the foreseeable future that will propose standards for general service LED lamps.

LED Reflector Lamps

(i) PAR, R, BPAR, BR, ER LED lamps

NEMA recommends that DOE use two parts of the ENERGY STAR specification as the energy conservation standard for LED reflector lamps: (1) the lumens per watt specification of 61 LPW if the lamp's color rendering index is 90 or greater; 70 lumens per watt if the lamp's color rendering index is less than 90; and (2) a power factor of 0.6 at 10 watts or less, and a power factor of 0.7 if the lamp uses more than 10 watts of energy.

[78] EERE-2013-BT-STD-0051-0066, NEMA Comments at 67-69 (May 16, 2016).

We reiterate our discussion at page 20, *supra*, that key design features of reflector lamps require a different efficacy standard than omnidirectional LED lamps. Reflector lamps have features and performance differences that make them somewhat less efficacious than omnidirectional lamps for the reasons previously explained.

(ii) MR LED lamps

We recommended a 15 watt cap in NEMA's prior comments.

(iii) *Other exempt specialty LED lamps*

With minor exception, NEMA is generally opposed to DOE's unwarranted, expansive regulatory engagement with this new technology. EERE-2013-BT-STD-0051-0066, NEMA Comments at 49-50 (May 16, 2016). NEMA proposed less burdensome wattage caps for two types of specialty LED lamps (an approach entirely consistent with Congress' treatment of the incandescent version of these lamps in EISA-2007): candelabra base LED lamps and intermediate base LED lamps would be subject to a wattage cap of ten watts. For the 3-way LED lamp, NEMA proposed that it be required to meet the same efficacy curve as the general service LED lamp at the highest wattage of the lamp.

D. The rulemaking shall include consideration of a minimum standard of 45 lumens per watt for general service lamps

The Secretary should consider a minimum standard of 45 lumens per watt for general service lamps and determine **not** to adopt such a standard. It cannot be economically justified.

The reasons for rejecting such a standard are manifest from DOE's January 18, 2017 *Statement Regarding Enforcement of 45 LPW General Service Lamp Standard,* which acknowledged the Department's understanding that a 45 lumen per watt standard would cause manufacturers to "face a difficult transition complying with such a standard, for one or more lamp categories defined as general service lamps."[79] This is a reference to the fact that the rulemaking record documented that incandescent lighting would be eliminated from the market and product shortages may likely ensue if

[79] It is not clear why the DOE would even think this; however, we believe the DOE has a mistaken belief that its *indecision* on determining whether to amend energy conservation standards for GSILs by January 1, 2017 results in a 45 lumen per watt energy conservation standard for all general service lamps. The plain text of the statute could not be clearer that this is not true: the January 1, 2017 deadline to publish an amended standard for GSILs is applicable only "If the Secretary determines that the standards in effect for GSILs should be amended . . ." 42 U.S.C. §6295(*i*)(6)(A)(iii). It is only DOE action determining to amend GSIL standards that triggers the January 1, 2017 publication deadline, not indecision. Here, the final rules clearly stated DOE was taking no action to amend standards for GSILs. We believe that the current regulatory proceeding in this matter will clarify this, and the enforcement statement must be withdrawn because it is contrary to law. In its comments in this rulemaking, NEMA provided substantial evidence why an amendment to GSIL standards could not be economically justified under the statute.

the Department pursued standards that eliminated incandescent light bulbs from the market. Why the Department of Energy would even put the American consumer, let alone American manufacturers and their employees in such a "difficult" position is inexplicable in our view. And it comes in the face of data demonstrating the market and American consumers are supplying and buying energy savings light bulbs at an unprecedented rate. The Department does not need to create a new problem that the market can solve in an orderly manner while achieving significant energy savings. Completing the rulemaking will enable the Department to address these problems and avoid the difficult position to which DOE apparently decided to expose consumers and manufacturers.

Furthermore, it is indisputable that there are lighting applications where incandescent lighting is likely to be preferred by the consumer for economic and/or aesthetic reasons. In environments where lamps have low operating hours, the incandescent lamp with a lower initial acquisition cost is the more economical choice over CFL and LED lamps where the higher acquisition cost takes a long time to recover in terms of energy savings. The DOE has previously acknowledged that consumers preferentially install more efficacious lamps in applications with longer operating hours, while using lower cost less efficacious lamps with lower hours of use. DOE, NOPR Technical Support Document, TSE at 7.3.1 (February 2016). This is rational, economically justifiable behavior.[80]

E. If the Secretary determines that the standards in effect for GSILs should be amended, the Secretary shall publish a final rule not later than January 1, 2017, with an effective date that is not earlier than 3 years after the date on which the final rule is published.

If the Secretary determines that standards in effect for GSILs should *not* be amended, as NEMA has recommended above because they cannot be economically justified, then this requirement is moot.

F. The Secretary shall consider phased-in effective dates under this subparagraph after considering (I) the impact of any amendment on manufacturers, retiring and repurposing existing equipment, stranded investments, labor contracts, workers, and raw materials; and (II) the time needed to work with retailers and lighting designers to revise sales and marketing strategies.

The Secretary has already indicated in this rulemaking that it may consider phased-in effective dates and whether that is necessary depends upon the nature of the proposed energy conservation standard.

G. CONCLUSION

The GSL Rule and IRL Rule significantly misconstrued the statute with respect to DOE's obligations for this rulemaking. The analytical flaws emanating from erroneous statutory construction

[80] NEMA Comments at 55 (May 16, 2016), EERE 2013-BT-STD-0051-0066.

extended to both (i) what the statute called upon DOE to undertake (and DOE did not), and (ii) to the conclusions of (a) whether other specialty lamps are "used to satisfy lighting applications traditionally served by general service incandescent lamps" and are therefore general service lamps, and (b) whether a lamp's current exemption from regulation under EPCA should be discontinued. It also extends to the DOE's conclusion that Congress expressed a preference or a presumption for a 45 lumen per watt standard, when the statute clearly shows that it did not. On this latter point, we address DOE's inconsistent views of its actions in Appendix B to these Comments.

APPENDIX A

Pursuant to 10 CFR 1004.11, NEMA designates portions of Appendix A Confidential Business Information and that it be treated confidentially not subject to disclosure, because it contains exclusive proprietary data collected from manufacturers who, in the aggregate, account for a substantial share of lamp shipments in the United States. This type of data is collected by no other entity, and it is collected on a requirement that the data not be shared with others. The aggregated data is not provided to firms or persons who have not provided the input data for the aggregated data reports. There are other organizations who make estimates of similar data without access to manufacturer data, and NEMA has found that those other sources are not often reliable. Disclosure of NEMA data would harm NEMA competitively. We provide the confidential information with the DOE solely on the condition that it is treated confidentially and will not be disclosed, and to assist the government in assessing the reasonableness of estimates provided by NEMA in these Comments.

The data collected by NEMA is not provided by every manufacturer or seller of lamps in the United States. The percentage extent to which the NEMA data covers the entirety of lamp shipments will vary between incandescent, compact fluorescent, and LED lamps. This is because certain lamps are imported to the United States by non-manufacturer importers more than others. The estimate of that variance is confidential, because it could expose NEMA collected data. Notwithstanding that the NEMA shipment data does not provide 100% coverage, the NEMA data is still very valuable because, the NEMA manufacturers represent such a significant part of the market for lamps, it confirms trends in the market that correspond to what the market is actually experiencing. Other sources of information are available to NEMA members to fill gaps not accounted for by the aggregated NEMA reports, including U.S. government data on imports of these products.

For general service incandescent lamps, we note the following sources of information available and we provide an Index (2011=100) to highlight the trend:

General Service Incandescent Lamp Shipments 2011 – 2016 (millions of units)

	2011 Domestic Shipments	2012 Domestic Shipments	2013 Domestic Shipments	2014 Domestic Shipments	2015 Domestic Shipments	2016 Domestic Shipments
DOE NODA	737	634	626	499	441	N/A
NODA Index	100	86	84.9	67.7	59.9	N/A
NEMA	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
Index	100	83	80	58	45	44
Adjusted NEMA	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
Index	100	84	80	58	45	44
Cadeo Group[81]	929	767	664			
Index	100	82	71	N/A	N/A	N/A

[81] Carmichael, R. GSL shipments and lumen bin distribution data. 2014. Washington, DC. Cadeo Group. Contract 7094760-T2D.

NEMA members account for [redacted] of domestic production of GSIL and most imports. The confidential NEMA numbers are hard numbers, but they do not capture some imports of GSIL. They are not estimates. U.S. import data does not capture GSIL precisely as that term is used. Taking into consideration U.S. import data for categories that includes GSIL, NEMA members reasonably estimate that [redacted] of the NEMA collected data for domestic shipments of GSIL is not accounted for by the NEMA GSIL data each year. Accordingly, the adjusted NEMA figures add [redacted] to the NEMA data collected from manufacturers to form a reasonable estimate of the total shipment of GSIL during these years. The NEMA data and the adjusted NEMA estimates demonstrate that shipments of GSIL have fallen remarkably more than the DOE's NODA estimates.

[All domestic compact fluorescent lamp shipments represent imported product as none are manufactured domestically.] NEMA members view the federal government's import data for the MBCFL to be the most reasonable estimate of domestic shipments during the period displayed because for several years from 2007 – 2014, the imports were relatively stable, indicating that in excess of 300 million MBCFL were consumed domestically each year during this period. NEMA members historically accounted for [redacted] of domestic shipments of MBCFL until 2015 when certain members began shifting resources to LED products and NEMA member shipments of MBCFL started representing [75-80%] of domestic shipments. The trend data for MBCFL between imports and NEMA data as measured by indices is remarkably similar.

Medium Base Compact Fluorescent Lamp Shipments 2011 - 2016

	2011 Domestic Shipments	2012 Domestic Shipments	2013 Domestic Shipments	2014 Domestic Shipments	2015 Domestic Shipments	2016 Domestic Shipments
HTS Import Data 8539310060	302 million	315 million	309 million	328 million	262 million	124 million
Index	100	104.3	102.3	108.6	86.7	41
NEMA	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
Index 2011=100	100	108	109	111	80.5	36.9
Cadeo Group	250	250	243	N/A	N/A	N/A
Index	100	100	97			

Through the first six months of 2017, the HTS continues to report a decline in MBCFL shipments at 42.8 million units imported for domestic consumption through June 2017. At that rate, annualized shipments of MBCFL for 2017 might be expected to be less than 85 million units or 28% of the 2011 level.

The GU-24 pin base CFL shipments represent a very small fraction of MBCFL shipments. Their shipment trend has mirrored the MBCFL index; however, beginning in 2015 and 2016 the shipments of this pin-base lamp have fallen more dramatically than the MBCFL.

GU-24 Pin Base Compact Fluorescent Lamp Shipments 2011 – 2016 (millions of units)

	2011 Domestic Shipments	2012 Domestic Shipments	2013 Domestic Shipments	2014 Domestic Shipments	2015 Domestic Shipments	2016 Domestic Shipments
NEMA	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
Index 2011=100	100	111	120	72.8	32.2	10.1
Percent of MBCFL	6.2%	6.4%	6.9%	4.1%	2.5%	1.7%

In the meantime, as NEMA reported in previous comments in this rulemaking, domestic shipments of medium base general service (A-line) LED lamps have been surging.

General Service (A-line) LED Lamp Shipments 2011 – 2016 (millions of units)

	2011 Domestic Shipments	2012 Domestic Shipments	2013 Domestic Shipments	2014 Domestic Shipments	2015 Domestic Shipments	2016 Domestic Shipments
NEMA	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
Index 2011=100	100	275	591	2350	7866	16025
Adjusted NEMA	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
Index	100	200	450	1900	6250	12750
Cadeo Group	2	5.5	14.6	N/A	N/A	N/A
Index	100	275	730	N/A	N/A	N/A

[redacted] general service LED lamps are imported. [redacted] are currently assembled in the United States. Because the general service LED lamp is a very new product, NEMA members do not have historical import numbers by which to assess the relative size of imports from non-members. By 2015 it was known that there were many such importers and those imports were significant. In 2017, the U.S. Government began reporting import data for medium base general service (A-line) LED lamps. Through the first six months of 2017 total shipments of these lamps (HTS # 8539500010) is 166.7 million units, indicating that domestic shipments of general service LED lamps is likely to exceed 300 million units in 2017. NEMA data for the same six month period in 2017 was about [redacted] below the federal import number. Because of the lumpiness of imports by manufacturer and the impossibility of knowing which manufacturer imported when, six months of import data is not enough to draw a firm estimate of what portion of the market is not accounted for in the NEMA shipment data. NEMA members currently estimate [redacted] of domestic shipments of general service LED lamps from 2015 to the current period may not be accounted for by NEMA data. With this uncertainty, NEMA members reasonably estimate that NEMA data underestimates domestic general service LED shipments by [redacted] NEMA has adjusted its data to reflect this estimate.

Specialty Lamps

NEMA provides its confidential and proprietary estimate for candelabra base decorative lamps below. NEMA data for decorative lamps includes both medium base and candelabra base decorative lamps. In previous comments in this rulemaking, NEMA provided data for medium base lamps from most of the manufacturers who make and sell that product. We have backed out those medium base decorative lamp shipments for 2012-2015 that NEMA previously provided to DOE in this rulemaking to arrive at the estimated candelabra base decorative lamp shipments. NEMA manufacturers inform NEMA that their shipments of candelabra base incandescent lamps are slightly less in 2016 than 2015.

NEMA members recognize that the NEMA figures do not account for all imports of these lamps and there is not comparable U.S. import data available to estimate an adjusted number for candelabra base decorative lamps. What NEMA members do know is that imports of candelabra base incandescent lamps are not more than [redacted] NEMA's estimate below. It can be said with certainty that domestic shipments are nowhere near the DOE estimate for candelabra base incandescent lamps in the NODA by a wide margin. The NODA estimate for candelabra base lamps would make candelabra base incandescent lamp shipments approximately 60% of GSIL shipments, and that is simply not credible.

CANDELABRA BASE DECORATIVE SPECIALTY INCANDESCENT LAMP
Shipment Data (millions of units)

	Lamp Shape	2011 Domestic Shipments	2012 Domestic Shipments	2013 Domestic Shipments	2014 Domestic Shipments	2015 Domestic Shipments	2016 Domestic Shipments
DOE NODA	B,BA,C, CA,F, G16-1/2	201	203	205	208	209	N/A
Index 2012=100			100	101	102.5	103	N/A
NEMA	B,BA,C, CA,F, G16-1/2	N/A	[redacted]	[redacted]	[redacted]	[redacted]	N/A
Index 2012=100			100	86.4	90.4	85	N/A

The NEMA numbers for medium base decorative lamps were provided by NEMA previously in this rulemaking are referenced in the NODA. These numbers were obtained from a special survey of NEMA members who make and sell most of these lamps. Since data from one member company was not available for the year 2011, the data for medium screw base lamps begins with the year 2012. These figures do not account for all imports of these lamps, and again, there is not comparable U.S. import data available to estimate an adjusted number for medium base decorative lamps. NEMA

members estimate that imports of medium base decorative lamps are not more than [redacted] more than the NEMA estimate below.

MEDIUM BASE DECORATIVE SPECIALTY INCANDESCENT LAMP
Shipment Data

Lamp shape	2012 Domestic Shipments	2013 Domestic Shipments	2014 Domestic Shipments	2015 Domestic Shipments	2016 Domestic Shipments
B,BA,C,CA,F	45,101,327	41,807,901	29,661,407	26,470,193	N/A
Index 2012=100	100	92.7	65.7	58.7	
G25	46,402,599	43,979,690	36,905,627	33,401,786	N/A
Index 2012=100	100	94.8	79.5	72	
G30	157,629	169,429	154,008	114,951	N/A
Index 2012=100	100	107	97.7	72.9	
Total Medium base	91,661,555	85,957,231	66,721,042	59,986,930	N/A
Index 2012=100	100	93.7	72.8	65.4	

NEMA provides its confidential and proprietary data for medium base incandescent reflector lamps, which matches the definition of incandescent reflector lamps. These figures do not account for all imports of these lamps, and again, there is not comparable U.S. import data available to estimate an adjusted number for medium base decorative lamps. NEMA members estimate that imports of medium base decorative lamps are not likely more than [redacted] more than the NEMA figure disclosed below. Accordingly, NEMA has adjusted its shipment data by that percentage in order to account for non-NEMA imports The NODA estimates for IRL are not credible because it equates the quantity of domestic IRL shipments as essentially the same as the quantity of GSIL shipments in recent years, and that makes no sense. IRL shipments are a fraction of GSIL shipments.

MEDIUM BASE INCANDESCENT REFLECTOR LAMPS*
Shipment Data

	2011 Domestic Shipments	2012 Domestic Shipments	2013 Domestic Shipments	2014 Domestic Shipments	2015 Domestic Shipments	2016 Domestic Shipments
DOE NODA	308,000,000	312,000,000	315,000,000	319,000,000	316,000,000	N/A
Index 2011=100	100	101	102	103.5	102.5	
NEMA	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
Index 2011=100	100	92.5	93.2	88	73.6	70.1
NEMA adjusted	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
Index	100	92.5	93.2	88	73.6	70.1

*Includes incandescent reflector lamps as defined by Energy Policy and Conservation Act, including PAR, R, ER, BR, and BPAR.

NEMA provides its confidential and proprietary data for pin base multi-faceted reflector lamps, which matches the definition of incandescent reflector lamps. These figures do not account for all imports of these lamps, and again, there is not comparable U.S. import data available to estimate an adjusted number for medium base decorative lamps. NEMA members estimate that imports of pin-base reflector lamps are not like more than [redacted] more than the NEMA estimate below.

MULTI-FACETED REFLECTOR (MR) LAMPS
Shipment Data (millions of units)

	2011 Domestic Shipments	2012 Domestic Shipments	2013 Domestic Shipments	2014 Domestic Shipments	2015 Domestic Shipments	2016 Domestic Shipments
DOE NODA*	48,700,000	49,300,000	49,800,000	50,400,000	49,700,000	N/A
Index	100	101	102.2	103.4	102.8	
NEMA Low voltage pin	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
Index	100	102.7	96.1	72.4	62.9	51.7

APPENDIX B

Other Observations on the GSL Rule

In the GSL Rule, DOE articulated in what can only be labeled *dictum* a strained and incredible understanding of Congress' intent with respect to this rulemaking. Congress' intent is reflected in (a) the statutory text for this rulemaking, and (b) the overall structure of the underlying statute, the Energy Policy and Conservation Act (EPCA) itself.

While DOE stated several times in the GSL Rule that it was not adopting any standards for GSL or GSIL, it made inconsistent statements that suggested it believed it was doing just that and that incandescent lamps would be eliminated from the market by its action.

> While it may not be possible to make incandescent lamps suitable for many current applications that meet a 45 lm/W standard, and consequently the paragraph (i)(6)(A) standards may result in the elimination of incandescent lamps covered by the standards, that outcome is the evident policy set by EISA 2007 regarding energy use in lighting. Therefore it is reasonable not to engage in a section 6295(o) analysis of technological feasibility in reviewing the GSL exemptions.

82 Fed.Reg at 7279 (January 19, 2017).

DOE reiterated in the Final Rule its mistaken conclusion that EISA 2007 was written to eliminate incandescent technology in this rulemaking:

> Indeed, that premise is fundamental to the policy set by EISA 2007 regarding energy use in lighting; the 45 lm/W default standard would likely preclude the use of incandescent technology for any lamp to which it applied.

82 Fed.Reg at 7301 (January 19, 2017). That asserted "premise" is patently false.

The fact of the matter is that it was not Congress' "evident policy set by EISA 2007 regarding energy use in lighting" to "eliminat[e] incandescent lamps covered by standards." NEMA specifically rebutted that claim in its May 2016 Comments in this rulemaking: demonstrating that that conclusion is (1) specifically contrary to the statutory text applicable to this rulemaking and a later rulemaking after 2020 involving the same products; (2) contradicted by the legislative history of congressional action leading to passage of EISA 2007; and (3) NEMA data showing a substantial likelihood that "EISA 2007's [goal] regarding energy use in lighting" is being met by market forces alone and a 45 lumen per watt standard for general service lamps was unnecessary. NEMA Comments at 99-101 (May 16, 2016). EERE-2013-BT-STD-0051-0066.

To support its peculiar interpretation of Congress' intent for this rulemaking, DOE made this statement in the Final Rule that flipped the statutory scheme on its head:

> By contrast, in section 6295(i)(6), Congress expressed a strong preference for 45 lm/W as an efficacy standard. If DOE takes no other action, that will be the standard for GSLs. Congress permitted DOE to establish different standards if DOE chooses to do so and can demonstrate that an alternative set of standards would produce at least as much energy savings.

82 Fed. Reg. at 7278 (January 19, 2016). DOE multiplied its interpretive error two-fold when it later said, "The regulatory program that EISA 2007 established was a preference and presumption for a 45 lm/W standard." 82 Fed. Reg. at 7282 (January 19, 2016). The statute, however, describes no such preference or presumption. What DOE described as a preference or presumption Congress understood was a "last resort." See text accompanying note 83, *infra*.

As this Comment details at the outset, this rulemaking procedure was first and foremost required ("shall") to determine whether or not standards in effect for GSILs should be amended to establish more stringent standards or not amended at all. At the very top of the statutory list of requirements for this rulemaking, that specific determination was Congress' priority. In undertaking that requirement, DOE would necessarily have to comply with the requirements of 42 U.S.C. §6295(o)(2),(3), which provide in pertinent part that DOE will determine that amended standards are "technologically feasible and economically justified" and will "result in significant conservation of energy." See also 42 U.S.C. §6295(n)(2). That determination requires DOE to analyze the burdens and benefits of a proposed amended energy conservation standard. 42 U.S.C. §6295(o)(2)(B). If amended standards for GSIL could not be economically justified or were not technologically feasible, Congress' EISA 2007 standards for GSIL would be left intact.

In fact, DOE started down the road of looking at making determinations to amend or establish energy conservation standards for some GSLs in this rulemaking as section 6295(i)(6)(A) would have expected DOE to do. In its March 2016 Notice of Proposed Rulemaking (NOPR) in this proceeding, DOE proposed energy conservation standards for general service LEDs and compact fluorescent lamps, and a 45 lumen per watt standard for some other lamps (but not including GSILs). 81 Fed.Reg. 14528, 14630 (March 17, 2016). DOE conducted a preliminary analysis and sought comment on the benefits and burdens of its proposal, 81 Fed.Reg. 14528, -530, 534-540, 606-607, and 626-627 (March 17, 2016), in light of all the factors contemplated by section 6295(o)(2), (3) that the Secretary would have to look at in deciding whether standards can be economically justified.

The *dictum in the GSL Rule practices* the high art of inconsistent reasoning. On the one hand, DOE says that it is doing nothing that will impose any burdens or costs on anyone, it does not need to analyze those burdens, and for purposes of the Congressional Review Act there are no costs or burdens to report to Congress. On the other, hand DOE says in *dicta* that maybe it is doing something that will impose burdens and costs on manufacturers and the public.

By the time the GSL Rule was "issued" in December 2016, DOE announced it was not yet undertaking Congress' direction to the Secretary that he shall "determine whether (I) standards in effect for general service lamps should be amended to establish more stringent standards than the standards

specified in paragraph (1)(A); and . . ." Instead, DOE states multiple times, "This final rule does not determine whether DOE should impose or amend standards for any category of lamps, such as GSILs or GSLs." 82 Fed.Reg. at 7277 (January 19, 2017), and consequently DOE concluded that it no longer needed to consider the burdens and benefits of a proposed rule pursuant to section 6295(o).

Additionally, DOE claimed that it did not consider its Final Rule to be a "significant regulatory action" under Executive Orders 12866 , see 82 Fed.Reg. at 7318 (January 19, 2017), and did not consider its Final Rule to be a "major rule" under the Congressional Review Act. See 82 Fed.Reg. at 7320 (January 19, 2017). DOE's rationale for these conclusions: "this final rule merely defines what constitutes a GSIL and what constitutes a GSL. Lamps that are GSLs will become subject to either a standard developed by DOE or to a 45 lm/W backstop standard, but this rule does not determine what standard will be applicable to lamps that are being newly included as GSLs."

The clear import of what DOE is saying here is that its Final Rule(s) "merely defin[ing] what constitutes a GSIL and what constitutes a GSL" was essentially an academic exercise with no real world impact and it does not need to assess the costs or other impacts of what it is doing. One can quibble whether definitions do or do not have a regulatory cost impact, but the clear import of what DOE is saying to this point is that DOE did not have to comply with legal obligations under EPCA and the Congressional Review Act because it concluded it was not imposing costs on anyone by its action.

The erroneous *dicta* in the GSL Rule indicates that DOE also believed at the time that the GSL Rule was issued on December 29, 2016 that it was not merely an academic exercise and the Final Rule would in fact have real world consequences that it was elsewhere denying in the Final Rule. DOE "acknowledged" in the Final Rule that it knew it may be imposing significant costs and other impacts on manufacturers and consumers:

> DOE acknowledges that manufacturers may face a difficult transition if required to comply with a 45 lm/W standard. Manufacturers have voiced concern regarding the loss of domestic manufacturing jobs, the stranding of inventory, the ability to meet the demand for all general service lamps with lamps using LED technology, and the burden associated with testing and certifying compliance for all general service lamps in DOE's Compliance Certification Management System (CCMS).

82 Fed.Reg. at 7317 (January 19, 2017)(emphasis supplied).

The contradiction that DOE put itself in is further revealed in its statement on the impact on small businesses:

> DOE notes that this final rule merely defines what constitutes a GSIL and what constitutes a GSL. Manufacturers of general service lamps are required to use DOE's test procedures to make representations and certify compliance with standards, if required. The test procedure rulemakings for CFLs, integrated LED lamps, and other general service lamps 30 addressed impacts on small businesses due to test procedure requirements. 81 FR 59386 (August 29, 2016); 81 FR 43404 (July 1, 2016). The effective

> date allows reasonable time for manufacturers to transition, while reducing the number of redesigns needed, should manufacturers need to comply with a 45 lm/W statutory standard beginning on January 1, 2020. For these reasons, DOE concludes and certifies that the new adopted definitions do not have a significant economic impact on a substantial number of small entities, and the preparation of an FRFA is not warranted.

82 Fed.Reg. at 7319 (January 19, 2017)(emphasis supplied). In this statement, the "effective date" is not merely about a change of definitions, but it is about the imposition of energy conservation standards for which "redesign" and new testing would be required "to comply," and for which certification and enforcement would occur.

By this view of the positions DOE took to avoid statutory obligations to address costs and burdens of its rules and report those facts to Congress, DOE now contradicts itself and says it was never really a matter of "if" manufacturers were required to comply with a 45 lumen per watt standard, but "when." And apparently DOE believed that "when" would become apparent in just a matter of days. Three weeks later, on January 18, 2017, DOE released a Statement Regarding Enforcement of 45 LPW General Service Lamp Standard:

> The Energy Policy and Conservation Act, as amended, requires that, effective beginning
>
> January 1, 2020, DOE shall prohibit the sale of any general service lamp that does not meet a minimum efficacy standard of 45 lumens per watt. DOE understands that manufacturers may face a difficult transition complying with such a standard, for one or more lamp categories defined as general service lamps, by that date.

This proposition is plainly incorrect; however, it reveals that DOE now mistakenly believed that by January 18, 2017 there might be a 45 lumen per watt standard (effective January 1, 2020) and that "manufacturers may face a difficult transition complying with such a standard, for one or more lamp categories defined as general service lamps, by that date." DOE is now saying that there may be real world impacts. Just three weeks earlier when DOE apparently issued the Final Rules on December 29, 2016 establishing the GSIL and GSL definitions, DOE effectively said (in the parlance of Executive Order 12866), without any analysis, that its "regulatory action [was not] likely to result in a rule that may have an annual effect on the economy of $100 million or more or adversely affect in a material way the economy" or have other impacts identified by Executive Order 12866, Section 804 of the Congressional Review Act, or section 6295(o) of EPCA. Now, in this January 18th "Statement," DOE is talking about "compliance" and "enforcement" of a new standard. Which DOE are we to believe: the DOE that told Congress pursuant to the Congressional Review Act that the Final Rule was not a "major rule," or the DOE that is now concerned about manufacturers facing a "difficult transition complying with such a standard," the loss of domestic manufacturing jobs, the stranding of inventory, and the prospects of product shortages?

What Changed? What Happened?

ANSWER: Nothing, except the passage of three weeks' time.

In the Final Rule, DOE foreshadowed what it was doing and thereby revealed, contrary to its stated positions regarding Executive Order 12866, the Congressional Review Act, and the benefit burden analysis required by 42 U.S.C. §6295(o), that it believed its action (or more appropriately indecision) would have significant real world impacts. This is because DOE incorrectly believed, "If DOE does not develop its own energy conservation standards for GSLs, section 6295(i)(6)(A)(v) requires it to impose a standard of 45 lm/W [lumens per watt]." 82 Fed.Reg. at 7278 (January 19, 2017).

In the Final Rule, DOE carefully and erroneously stated, "As of the issuance date [December 29, 2016] of this document the [45 lumen per watt] backstop standard would not be applicable. The backstop standard is not applicable unless DOE fails to complete the rulemaking as prescribed by EPCA by January 1, 2017, or the final rule does not produce savings that are greater than or equal to the savings from a minimum efficacy standard of 45 lm/W." 82 Fed.Reg. at 7316 (January 19, 2017)(emphasis added). DOE clearly believed, contrary to the words of the statute, that its deliberate indecision in determining whether or not to amend or promulgate energy conservation standards for GSILs or GSLs by January 1, 2017, would require it to impose a standard of 45 lumens per watt. The January 18, 2017 Statement Regarding Enforcement of 45 LPW General Service Lamp Standard confirms that DOE mistakenly believed this had occurred by the passage of three weeks' time. And if DOE believed this on "the issuance date [December 29, 2016] of this document," why was DOE claiming there were no economic impacts from its definitional rules to consider under Executive Order 12866, the Congressional Review Act, or 42 U.S.C. §6295(o)?

Fortunately for DOE, we do not need to debate whether its conclusions about the Executive Order, the Congressional Review Act, or EPCA were disingenuous because DOE was unequivocally legally incorrect when it said the "backstop standard is not applicable unless DOE fails to complete the rulemaking as prescribed by EPCA by January 1, 2017." That is not what the statute says. The authorizing section for this rulemaking mentions the January 1, 2017 date once, as follows:

> If the Secretary determines that the standards in effect for GSILs should be amended, the Secretary shall publish a final rule not later than January 1, 2017, with an effective date that is not earlier than 3 years after the date on which the final rule is published.

42 U.S.C. §6295(i)(6)(A)(iii)(emphasis supplied).

There is no ambiguity in Congress' statement; the Secretary's obligation under the statute to do anything in this rulemaking by January 1, 2017 was subject to a condition precedent: the Secretary had to "determine that the standards in effect for general service incandescent lamps should be amended." That condition precedent has not occurred as DOE repeatedly acknowledged in the Final Rule: "This final rule does not determine whether DOE should impose or amend standards for any category of lamps, such as GSILs or GSLs." 82 Fed.Reg. at 7277 (January 19, 2017). Since the condition precedent has not occurred, DOE has not (yet) "fail[ed] to complete a rulemaking in accordance with clauses (i) through (iv)," 42 U.S.C. §6295(i)(6)(A)(v), because of a January 1, 2017 deadline. The 45 lumen per watt backstop standard is not currently the law of the land, and there are good reasons why it should not be law.

DOE made an extraordinary effort in the GSL Rule to invent a congressional preference (or presumption) that would justify DOE's position relative to the "default" 45 lumen per watt standard. The statutory text does not support either a preference or presumption for a 45 lumen per watt standard for GSLs.

The authorizing section for this rulemaking contained a further provision calling on DOE to "consider" a 45 lumen per watt standard for GSLs:

> The rulemaking--
>
> (I) shall not be limited to incandescent lamp technologies; and
>
> (II) shall include consideration of a minimum standard of 45 lumens per watt for general service lamps.

42 U.S.C. §6295(i)(6)(A)(ii)(II). As NEMA explained in its previous comments in this rulemaking, it was public knowledge at the time Congress was considering EISA 2007 legislation that a technological breakthrough might make it possible to commercialize a GSIL with an efficacy of 45 lumens per watt or greater. The purpose of this text was not intended as a direction to the Secretary to exclude GSILs from the market, but to determine whether GSILs were available at a higher efficiency level that might become a new floor for incandescent lamps. DOE never addressed this comment in the Final Rule, because, again, it is a fact that does not fit well with the predetermined outcome the agency wanted to achieve.

Congressional direction to the Secretary of Energy to "include consideration" of something is neither a "dictate" nor something to slavishly "follow," nor does it reflect a strong preference or a presumption. It was just one factor for the Secretary to "examine" and if a 45 lumens per watt standard was not economically justified or technologically feasible as required by the statute, DOE could reject it. But it is legally indisputable that DOE would have to undertake a formal benefit and burden analysis as required by the statute if it considered a 45 lumen per watt standard in a standards rulemaking. DOE does not disagree with this proposition.

The authorizing section for this rulemaking contained another provision that likewise does not reveal a strong preference or presumption for a 45 lumen per watt standard. This is the so-called "backstop" provision, which DOE has concluded contains an energy conservation standard that DOE could willfully default to and ignore the statutory requirement in section 6295(i)(6)(A)(i)(I) to determine whether standards in effect for GSILs should be amended. The backstop provision says this:

> (v) Backstop requirement
>
> If the Secretary fails to complete a rulemaking in accordance with clauses (i) through (iv) or if the final rule does not produce savings that are greater than or equal to the savings from a minimum efficacy standard of 45 lumens per watt, effective beginning January 1,

> 2020, the Secretary shall prohibit the sale of any general service lamp that does not meet a minimum efficacy standard of 45 lumens per watt.

42 U.S.C. §6295(i)(6)(A)(v). If DOE seriously believed that the "backstop" was an energy conservation standard that it could willfully default to, as its erroneous dicta in the GSL Rule suggests, then either it did not understand this paragraph or DOE was being disingenuous. First, as explained above, this part of the statute mandated that the Secretary determine whether energy conservation standards in effect for GSILs should be amended to be more stringent than the GSIL standards enacted by Congress in EISA 2007. That congressional action item was the priority and preferential requirement for this rulemaking, not defaulting to a 45 lumen per watt standard. Defaulting to the 45 lumen per watt standard was not a discretionary option, but that is apparently what DOE mistakenly believed.[82] The statute said the backstop only applied if the DOE "failed to complete a rulemaking . . ." The backstop provision was a "last resort," not a preference or presumption.[83] To use a baseball analogy, the backstop is something to be avoided like a wild pitch.

How the DOE could possibly turn a "last resort" into a "strong preference" or "presumption" literally flips the statute on its head and this is not a matter for serious debate.

First, the legislative history leading to the enactment of EISA 2007 unambiguously demonstrates that Congress specifically rejected a 45 lumen per watt standard effective in 2020. If Congress seriously contemplated a strong preference for a 45 lumen per watt standard for general service lamps, it clearly knew how to say that as evidenced by the House bill that failed to become law. *Gulf Oil Corp. v Copp*, 419 U.S. 186, 199-200 (1974)(Congress's failure to enact a proposed version of a statute "strongly militates against a judgment that Congress intended a result that it expressly declined to enact."). Accord, *IBEW, Local Union No. 474 v. NLRB*, 814 F.2d 697, 711 (D.C. Cir 1987); *United States v. Solomon*, 563 F.2d 1121, 1125 & n4 (4th Cir. 1977)(declining to recognize Attorney General's authority to bring suit when Congress failed to pass bills that would have provided that authority).

Second, Congress only weakly suggested that DOE give "consideration" to a 45 lumen per watt standard in this rulemaking. 42 U.S.C. §6295(i)(6)(A)(ii)(II). As just noted, Congressional direction to the Secretary of Energy to "include consideration" of something is neither a "dictate" nor something to slavishly "follow," nor does it reflect a strong preference or a presumption.

Third, the 2007 lighting technology environment in which §6295(i)(6)(A) was enacted into law also belies DOE's interpretation of the statute that Congress established a preference or presumption for a 45 lumen per watt standard. There were no general service LEDs in existence in 2007 and there

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[82] That DOE flipped the statute on its head is revealed in its mistaken belief that it did not have an "obligation" to determine whether the standards in effect for general service lamps should be amended or not amended, notwithstanding the statute's mandatory word "shall" used by Congress in the statute. DOE interpreted the word "shall" in 42 U.S.C. §6295(i)(6)(A)(i) as a discretionary "option." See 82 FR at 7282 ("DOE is only obligated to issue a final rule if it decides that GSIL standards should be amended."). This view is rejected by 42 U.S.C. §6295(m). See discussion at page 62 and note 73, *supra*.

[83] The definition of "backstop": "an emergency precaution or last resort." Oxford English Dictionary ("Backstop").

were significant technological and economic hurdles to overcome become before such a lamp could be commercialized. The lamps in the market that Congress could actually touch and see in 2007 were the standard incandescent lamp, the new halogen incandescent lamp, and the compact fluorescent lamp and EISA 2007 would eliminate the standard incandescent lamp in favor of the halogen incandescent lamp by 2014. Only the compact fluorescent lamp (CFL), a light bulb that was wildly unpopular with consumers, would pass a 45 lumen per watt standard and Congress' explicit rejection of a 45 lumen per watt standard effective in 2020 confirms that there was no preference or presumption in favor of a standard that would leave only the CFL in the market.

When "the specific context in which [the] . . . language [of the backstop provision in 42 U.S.C. §6295(i)(6)(A)(v)] is used" and "the broader context of the statute as a whole" are considered, Congress' unambiguous intent reflects a requirement that specific determinations respecting energy conservation standards for different types of general service lamps be made by the Secretary through rulemaking and that the backstop was avoided if those standards "produce savings that are greater than or equal to the savings from a minimum efficacy standard of 45 lumens per watt, effective beginning January 1, 2020." 42 U.S.C. §6295(i)(6)(A)(v). NEMA demonstrated through its Comments in this rulemaking that Congress' energy savings goal as expressed in this provision can be expected to be satisfied, and that a 45 lumen per watt standard was unnecessary. DOE never addressed NEMA's comments on this point, because, contrary to Congress' intent, it was inconsistent with DOE's predetermined interest in eliminating incandescent lamps from the market.

Ignoring the statutory requirement to determine whether standards in effect for GSILs should or should not be amended and choosing a default backstop standard that was to be avoided is exactly what DOE did. Instead of making the determinations that Congress required the DOE to undertake in §6295(i)(6)(A)(i), DOE's Final Rule consciously chose indecision because of perceived consequences that were aligned with the Department's predetermined objectives in this rulemaking. Agency indecision in this case is inconsistent with the statutory scheme.

The Final Rule is a work of many contradictions. On the question of whether the outcome of this rulemaking was the adoption of energy conservation standards, DOE said it was not adopting standards:

> This final rule neither implements nor seeks to enforce any standard. Rather, this final rule merely defines what constitutes a GSIL and what constitutes a GSL. Lamps that are GSLs will become subject to either a standard developed by DOE or to a 45 lm/W backstop standard, but this rule does not determine what standard will be applicable to lamps that are being newly included as GSLs. *** this rule does not establish standards." 82 Fed.Reg at 7318 (January 19, 2017).

Elsewhere DOE reinforced this message stating, "This final rule does not determine whether DOE should impose or amend standards for any category of lamps, such as GSILs or GSLs." Id at 7288.

Where DOE lost its statutory compass is reflected in this statement in the Final Rule:

> To be clear, DOE *infers*, from the language instructing it to initiate a rulemaking procedure that EPCA authorizes it to complete the rulemaking by issuing final rules taking one or more of the actions on which section 6295(i)(6)(A)(i) calls for a rulemaking. Otherwise the mandate to initiate a rulemaking would be pointless. It does not follow, and DOE does not infer, that DOE must issue final rules on each of those items—aside, of course, from the circumstance just mentioned in which DOE determines GSIL standards should be amended."

82 Fed.Reg. at 7282 (January 19, 2017)(emphasis added).

Here, DOE explicitly acknowledges that Congress required the Department to "determine whether general service incandescent lamp standards should be amended," but DOE does not say it must address the alternative of determining not to amend those standards. As noted earlier, this is not a reasonable interpretation of the statute. DOE is obligated to decide whether or not to amend. See discussion at pages 62-63, *supra*. DOE was required to determine --- after undertaking the appropriate statutory analysis under section 6295(o) --- that the standards in effect for GSILs should or should not be amended. DOE apparently read its responsibility here very narrowly, asserting that Congress was only asking DOE to determine only that standards in effect should be amended and not whether they should not be amended.

NEMA provided extensive comments in this rulemaking why energy conservation standards for GSILs should not be amended because they were not economically justified and why a 45 lumen per watt standard for GSLs was not economically justified. NEMA provided significant detail supporting its assertion that "it is inconceivable that an energy conservation standard for general service incandescent lamps based on halogen IR technology will ever be economically justified. It makes no sense for the consumer; it makes no sense for the manufacturer; it makes no sense for the factory worker; it makes no sense for the nation." As for the consumer and the nation, DOE's own data demonstrated that a 45 lumen per watt standard effective January 1, 2020 could be expected to result in product shortages because there would not be sufficient global capacity to make general service LED lamps suddenly replace 400 million units of GSILs that would be banned by such a standard. DOE acknowledged these concerns in the GSL definition Final Rule. See pages 74-75, *supra*. Those two points should lead to the conclusion that amending standards in effect for GSILs in paragraph (1)(A) cannot be economically justified. DOE never addressed these points in the GSL Rule.

Finally, we observe that DOE has not failed to complete a rulemaking in accordance with 42 U.S.C. §6295(i)(6)(A)(i)-(iv).

(i) The Secretary was required to initiate a rulemaking by January 1, 2014 to determine whether to amend standards in place for GSLs, and to address definitional issues. The Secretary met this requirement. 78 Fed. Reg. 73,737.

(ii) The scope of the rulemaking had to be broader than incandescent lamp technologies, and had to include consideration of a 45 lumens/Watt standard. The Secretary met this requirement.

See, e.g., Energy Conservation Program: Energy Conservation Standards for General Service Lamps, Notice of Proposed Rulemaking, 81 Fed. Reg. 14,528, 14,533, 14,550, 14,621 (Mar. 17, 2016).

(iii) If the Secretary determines that the standards in effect for GSILs should be amended, the Secretary had to publish a final rule by January 1, 2017. The Secretary would have failed to meet this requirement only if he had determined that standards for GSILs should be amended and failed to publish a rule by the specified date. The Secretary has not determined that the standards for GSILs should be amended. See 82 Fed. Reg. at 7277. Indeed, the Secretary has commenced a process to determine whether to set efficiency standards for GSILs. 82 Fed. Reg. at 38,614 (DOE recognizing that it "has not yet made a determination" regarding whether to amend standards for GSILs, and soliciting data to help in making a determination). In doing this, the Secretary has acknowledged that he has not yet made such a determination. Therefore, the Secretary has not failed to follow this statutory requirement.

(iv) Finally, the Secretary had to consider phased-in effective dates based on consideration of statutorily specified factors. The Secretary met this requirement. See, e.g., 81 Fed. Reg. at 14,584.

In short, the Secretary has not failed to complete a rulemaking in accordance with the requirements of 42 U.S.C. § 6295(i)(6)(A)(i)-(iv). And he has certainly not issued a prohibition on sales under the backstop requirement of § 6295(i)(6)(A)(v).

APPENDIX C

ENERGY SAVER

INCANDESCENT LIGHTING

Incandescent lighting is the most common, and least energy efficient, type of lighting used in homes. | Photo courtesy of ©iStockphoto/TokenPhoto.

Incandescent lamps are often considered the least energy efficient type of electric lighting commonly found in residential buildings. Although inefficient, incandescent lamps possess a number of key advantages--they are inexpensive to buy, turn on instantly, are available in a

huge array of sizes and shapes and provide a pleasant, warm light with excellent color rendition.

However, because of their relative inefficiency and short life spans, they are more expensive to operate than newer lighting types such as **compact fluorescent lamps (CFLs)** and **light-emitting diodes (LEDs)**.

Learn more about **how energy-efficient lamps compare with traditional incandescents** and **replacing incandescent lamps**.

TYPES OF INCANDESCENT LAMPS

There are three common types of incandescent lamps (called A-line lamps) used in residential applications:

- Standard incandescent or pear-shaped A-19 lamps
- Energy-saving or halogen A-19 lamps
- Reflector or parabolic reflector (PAR) lamps, sometimes called "flood" or "spot" lamps

STANDARD INCANDESCENT A-LINE LAMPS

Commonly known as the screw-in "A"-type lamp that use a medium Edison (E-26) base, standard incandescent bulbs are the least efficient light source commonly found in homes. These lamps produce visible light by heating a tiny coil or filament of tungsten wire that glows when it is heated by an electrical current.

"Long-life" lamps are an example of lamps with thicker, stronger filaments that can last much longer than a standard service lamp, but they are less energy efficient.

New efficiency standards for lighting require lamps to use about 25% less energy. These standards began taking effect starting in January 2012 and the phase-in will be complete as of January 1, 2014, after which time traditional incandescent general service lamps such as the common A-19 will not be available in most stores. Learn more about the **new lighting standards**.

ENERGY-SAVING INCANDESCENT (OR HALOGEN) LIGHTBULBS

A halogen lamp is a type of incandescent lamp with a capsule that holds a special halogen gas composition around the heated filament to increase the efficacy of the incandescence. They are more energy efficient than standard incandescent bulbs but somewhat more costly. Halogen lamps may also have a special inner coating that reflects heat back into the capsule to further improve efficacy by "recycling" the otherwise wasted heat. Together, the filling and coating recycle heat to keep the filament hot with less electricity. They also provide excellent **color rendition**.

Halogens are a little more expensive than standard incandescent lamps, but are less expensive to operate because of their higher **efficacy** and longer life expectancy. They are commonly used in reflector lamps such as indoor and outdoor flood or spot lighting, indoor recessed and track fixtures, and floor and desk lamps.

Some halogen bulbs are dimmable, as indicated on the package, and are compatible with timers and other **lighting controls**.

REFLECTOR LAMPS

Reflector bulbs (Type R) spread and direct light over specific areas. They are used mainly for floodlighting, spotlighting, and down lighting applications both indoor and outdoor.

There are two types of reflector lamps:

- **Parabolic aluminized** reflector lamps (Type PAR) are used for a number of applications, including outdoor floodlighting.
- **Ellipsoidal** reflector lamps (Type ER) focus light beams about 2 inches in front of its enclosure, projecting light down from recessed fixtures. Ellipsoidal reflectors are twice as energy efficient as parabolic reflectors for recessed fixtures.

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