



U.S. HOUSE OF REPRESENTATIVES
COMMITTEE ON ENERGY AND COMMERCE

January 8, 2016

TO: Members, Subcommittee on Energy and Power
FROM: Committee Majority Staff
RE: Hearing entitled “H.R. ____, the EPS Improvement Act of 2016”

I. INTRODUCTION

On Tuesday, January 12, 2016, at 10:00 a.m. in 2322 Rayburn House Office Building, the Subcommittee on Energy and Power will hold a hearing entitled “H.R. ____, the EPS Improvement Act of 2016.”

II. WITNESSES

- **Dr. Pekka Hakkarainen**, Vice President, Lutron Electronics, *on behalf of the National Electrical Manufacturers Association*; and,
- **Jennifer Amann**, Buildings Program Director, American Council for an Energy-Efficient Economy.

III. BACKGROUND

The Energy Policy Act of 2005 amended the Energy Policy and Conservation Act¹ to, among other things, direct the Department of Energy (DOE) to establish energy conservation standards for external power supplies (EPS).² By statute, EPS is defined generally as “an external power supply circuit that is used to convert household electric current into DC current or lower-voltage AC current to operate a consumer product.”³ As stated by DOE, the term is intended to cover those products that “convert household electric current into direct current or lower-voltage alternating current to operate a consumer product such as a laptop computer or smartphone.”⁴ In simpler terms, EPS are generally understood to be devices that connect electronics to plug-loads, such as the detachable cords that provide power to laptops and mobile devices.

Given the broad and circular statutory definition of EPS, DOE has determined that additional products should be covered by the EPS definition for purposes of regulation. For instance, in a 2014 final rule establishing efficiency standards for EPS products, DOE included as a regulated EPS product certain drivers and devices that power solid state lighting products

¹ Energy Policy and Conservation Act of 1975, Pub. L. No. 94-163 (Dec. 22, 1975) (42 U.S.C. § 6291, *et seq.*).

² Energy Policy Act of 2005, Pub. L. No. 109-58, § 135 (Aug. 8, 2005).

³ 42 U.S.C. § 6291.

⁴ *DOE Appliance and Equipment Standards Rulemakings and Notices, External Power Supplies*, available at https://www1.eere.energy.gov/buildings/appliance_standards/product.aspx/productid/23.

(e.g., light-emitting diodes (LEDs) and organic light-emitting diodes (OLEDs)).⁵ DOE made this determination despite the fact that the design and use of LED drivers is distinct from the design and use of EPS. While EPS's use a single stage power conversion, LED drivers utilize a two stage power conversion design.⁶ DOE's EPS efficiency standards are based on a single stage design. A standard based on a single stage design is not appropriate for LED drivers. Moreover, the market for LED technologies and related-drivers and devices was not yet established when Congress defined EPS in 2005. The requirements of the DOE final EPS rule go into effect in February 2016.

IV. LEGISLATION

On January 5, 2016, Rep. Ellmers (R-NC) and Rep. DeGette (D-CO) released a draft of H.R. ____, the "EPS Improvement Act of 2016." The legislation would exclude certain lighting technologies from the definition of EPS included in the EPS efficiency standard finalized in 2014 by DOE. It also establishes the circumstances by which DOE may prescribe standards in the future for certain solid state lighting drivers.

The legislation includes the following provisions:

Section 1:

This section provides the short title of "EPS Improvement Act of 2016."

Section 2:

This section amends and clarifies the statutory definition of "EPS" to exempt solid state lighting drivers that are designed to be connected to and power LEDs or OLEDs providing illumination.

Section 3:

This section establishes the conditions by which DOE may undertake a rulemaking in the future, subject to current statutory regulatory requirements, to establish standards for certain consumer and industrial solid state lighting drivers and devices. This section also requires that DOE make public the testing procedure requirements for at least a year before any Department energy conservation standard for these technologies is prescribed.

V. ISSUES

The following issues may be examined at the hearing:

- The original intent of Congress in providing DOE authority to set efficiency standards for EPS technologies;

⁵ *Energy Conservation Standards for External Power Supplies*, 79 Fed. Reg. 7846 (Feb. 10, 2014).

⁶ For more on the distinction between EPS and LED drivers see Attachment 1.

- The potential impact of the final EPS efficiency standard on certain LED and OLED technologies, manufacturers, and consumers;
- The distinction between EPS and LED and OLED drivers and devices; and,
- The remedy provided by the EPS Improvement Act of 2016.

VI. STAFF CONTACTS

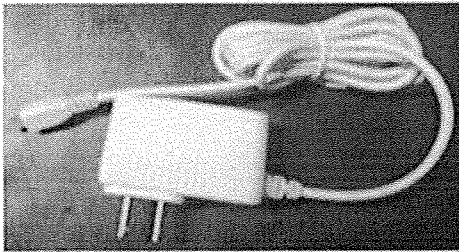
If you have any questions regarding this hearing, please contact Patrick Carrier of the Committee staff at (202) 225-2927.

Attachment 1

External Power Supplies vs. SSL Drivers

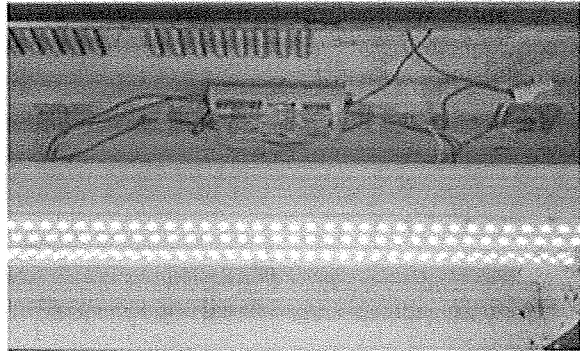
External Power Supply

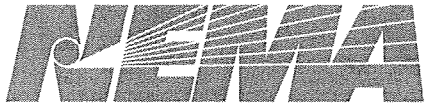
- ⓐ Is **Separate** to the system.
- ⓐ Provides **Only** power.
- ⓐ The user has the **Option** to unload the power supply.
- ⓐ Commercial and residential EPSs are typically a **Plug Load**



SSL Driver

- ⓐ Is **PART** of the system.
- ⓐ Provides **Multiple Functions**.
- ⓐ **No Option** for the user to "Unload" from the LED Modules.
- ⓐ SSL Drivers are **Hard Wired** to the electrical Distribution System by an electrician.





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

National Electrical Manufacturers Association

January 12, 2016

Testimony of Dr. Pekka Hakkarainen
Vice President, Lutron Electronics

on behalf of the National Electrical Manufacturers Association

Committee on Energy and Commerce
Subcommittee on Energy and Power
U.S. House of Representatives

Hearing on the EPS Improvement Act of 2016

One Page Summary

In 2005, Congress amended the Energy Policy Act of 2005 (EPA 2005), directing the Department of Energy to establish energy conservation standards for External Power Supplies (EPS). An External Power Supply was defined as “external power supply circuit that is used to convert household electric current into DC current or lower-voltage AC current to operate a consumer product.” It can be readily seen that the definition of an external power supply uses the words external, power and supply, but as technology has advanced, this definition has created significant confusion in the lighting industry.

According to the Department of Energy, the EPS products that were meant to be covered are those that “convert household electric current into direct current or lower-voltage alternating current to operate a consumer product such as a laptop computer or smartphone.” However, new products used in solid state lighting, which did not exist at the time EPA 2005 was passed, were deemed to be included in the congressional definition during the DOE rulemaking process and subject to the energy conservation standards.

The DOE’s Final Rule, which becomes effective February 10, 2016, includes as a regulated “EPS” certain drivers that power solid state lighting products (e.g., LEDs), which industry and the efficiency community agree was never envisioned by Congress in 2005 to be considered as consumer external power supplies.

Congressional action is needed before February 10, 2016 to reaffirm that Solid State Lighting Drivers are not included in the scope of the DOE’s EPS rule. The legislation excludes SSL Drivers from the EPS energy conservation standard. This necessary fix has wide support: not only does it have bipartisan support but it also has support from both manufacturers and the energy efficiency community.

LED Drivers represent the next wave of lighting technology and capabilities’, allowing for better and faster internet connections, enabling smart buildings, industry facilities, and homes to reduce their costs, enabling better consumer experiences in the retail industry, and even faster recovery times in hospitals by controlling the color and timing of the lights in recovery rooms. Additionally, investment in SSL technology is massive and ongoing. Anything that would slow this evolving and beneficial (i.e. highly efficient) technology would threaten additional investments.

Testimony of Dr. Pekka Hakkarainen

Good morning Chairman Whitfield, Ranking Member Rush, and members of the committee, my name is Dr. Pekka Hakkarainen, Vice President of Lutron Electronics. I want to first thank the committee for giving me the opportunity to testify today on the EPS Improvement Act. The bill before you is needed to fix a technical issue with the Department of Energy's February 2014 external power supply (EPS) energy conservation standard that goes into effect on February 10, 2016. I am here today testifying on behalf of Lutron Electronics and the National Electrical Manufacturers Association (NEMA). NEMA represents nearly 400 electrical, medical imaging, and radiation therapy manufacturers at the forefront of electrical safety, reliability, resilience, efficiency, and energy security. NEMA's combined industries account for more than 400,000 American jobs and more than 7,000 facilities across the U.S. Domestic production exceeds \$117 billion per year. A number of NEMA's members who manufacture and distribute solid-state LED lighting (SSL) products are impacted by the DOE external power supply standard.

My company Lutron Electronics is a privately held company founded in 1961 and is headquartered in Coopersburg, Pennsylvania. Lutron's products range from consumer dimmers for residential applications to motorized window shades for residential and commercial buildings and to lighting management systems for entire buildings, both residential and commercial. Lutron products have been sold in approximately 100 countries around the world. In the U.S. alone, Lutron products are estimated to save 10 billion kWh of electricity corresponding to \$1 billion in utility costs annually. The early inventions of Lutron's founder, the late Joel Spira, are now at the Smithsonian National Museum of American History.

In 2005, as part of the Energy Policy Act of 2005, Congress first amended the Energy Policy and Conservation Act, to define and direct the Department of Energy (DOE) to establish test procedures and set energy conservation standards for External Power Supplies (EPS). An External Power Supply was defined as "external power supply circuit that is used to convert household electric current into DC current or lower-voltage AC current to operate a consumer product." (See Attachment A.)

In December 2006, the Department of Energy published a final rule that established test procedures for several products, including external power supplies. The following year in 2007 Congress began and completed work on the Energy Independence Act of 2007 (EISA) which was signed into law on December 19, 2007 and as part of the Act Congress made several changes to the external power supply statute. The changes to the statute, clarified what was an external power supply by creating a subset of external power supplies called "Class A External Power Supplies". Besides further defining an external power supply, this new subset included language that excludes any device requiring Federal Food and Drug Administration (FDA) listing and approval as a medical device in accordance with section 513 of the Federal Food, Drug, and Cosmetic Act (21 U.S.C. 360(c) along with devices that power the charger of a detachable battery pack or that charge the battery of a product that is fully or primarily motor operated. Since that time DOE has established energy conservation standards for external power supplies as directed by Congress.

When Congress first directed DOE in 2005 to promulgate energy conservation standards for external power supplies, light emitting diodes (LED) lamps and solid state lighting (SSL) drivers (See Attachment B) were not on the market in any material way, nor in 2007 when EISA was enacted into law. This was a lighting technology in its incipiency. Several years later, after there had been significant technical developments in the nascent LED technology, and in the course of the DOE's rulemaking on energy conservation standards for external power supplies, DOE tentatively signaled that the definition of external power supplies could cover solid state lighting drivers because, along with controlling the light and providing other features, a solid state lighting driver does convert power for certain lighting technologies, primarily LEDs. In response to this concern Lutron, NEMA and other industry stakeholders submitted comments and attended public hearings asking DOE to clarify that these new-to-the-market technologies were not covered by the latest rule.

Our comments along with other industry comments made several points that explained why SSL drivers are different than the consumer EPSs Congress understood would be subject to energy conservation standards. Those points include:

National Electrical Manufacturers Association
1300 North 17th Street, Suite 900 - Rosslyn, VA 22209

SSL drivers are often used in commercial applications, and therefore should not be considered a consumer product; SSL power supplies are considered a part of the LED lighting system as a whole and typically tested as a system; SSL drivers operate typically at both 120V and 277V; SSL drivers are configurable to operate a range of LED driver loads; SSL drivers may have other features, such as dimming and network communication; SSL drivers have separate UL standards from EPS standards.

It was not until the final rule was released in 2014 when our questions were answered as part of the final rule document. In the final rule, DOE states while they did not test or consider any lighting products as part of their analysis or when developing the test procedure, that the current Congressional definition which they must follow may mean that certain solid state lighting drivers are categorized as an external power supply, thus creating great uncertainty in the market. According to the DOE, the EPS products that were meant to be covered are those that “convert household electric current into direct current or lower-voltage alternating current to operate a consumer product such as a laptop computer or smartphone.”

This inclusion of lighting products as part of the EPS rule is a problem because DOE did not consider SSL in their analysis; thus the test procedure was designed for EPSs only and did not take into account the complexity of solid state lighting drivers. While DOE was receptive to our concerns with the final rule, the statute prevents DOE from going back and resolving this issue, meaning the only way for this to be fixed is by Congress passing new legislation before February 10, 2016 when the new EPS standards go into effect.

As the committee members can see, Congress has a history with external power supplies and when needed, redefining the statute when technology has evolved. There have been significant technology and innovation advances of all kinds over the last decade especially in the lighting industry. These advances have been supported by Congress, and both industry and the Department of Energy have made significant investments since 2005 when Congress first directed the

Secretary of Energy to carry out a Next Generation Lighting Initiative to support research and development in solid state lighting technologies as part of EPACK 2005.

The EPS Improvement Act resolves an unintended consequence by amending and clarifying the statutory definition of “external power supplies” to exclude solid state lighting drivers that are designed to be connected to and power light-emitting diodes (LEDs) or organic light-emitting diodes (OLEDs) providing illumination. The EPS Improvement Act then, restates the conditions under which the DOE could undertake a rulemaking in the future, subject to current statutory regulatory requirements, for solid state lighting drivers. Furthermore, the language also requires that DOE make public the testing procedure requirements for at least a year before any Department energy conservation standard for these technologies is prescribed.

This necessary fix has wide support, not only does it have bipartisan support but it also has support from both manufactures and the energy efficiency community (See Attachment C). Similar language has already passed the House by voice vote as an amendment to H.R. 8, the North American Energy Security and Infrastructure Act of 2015.

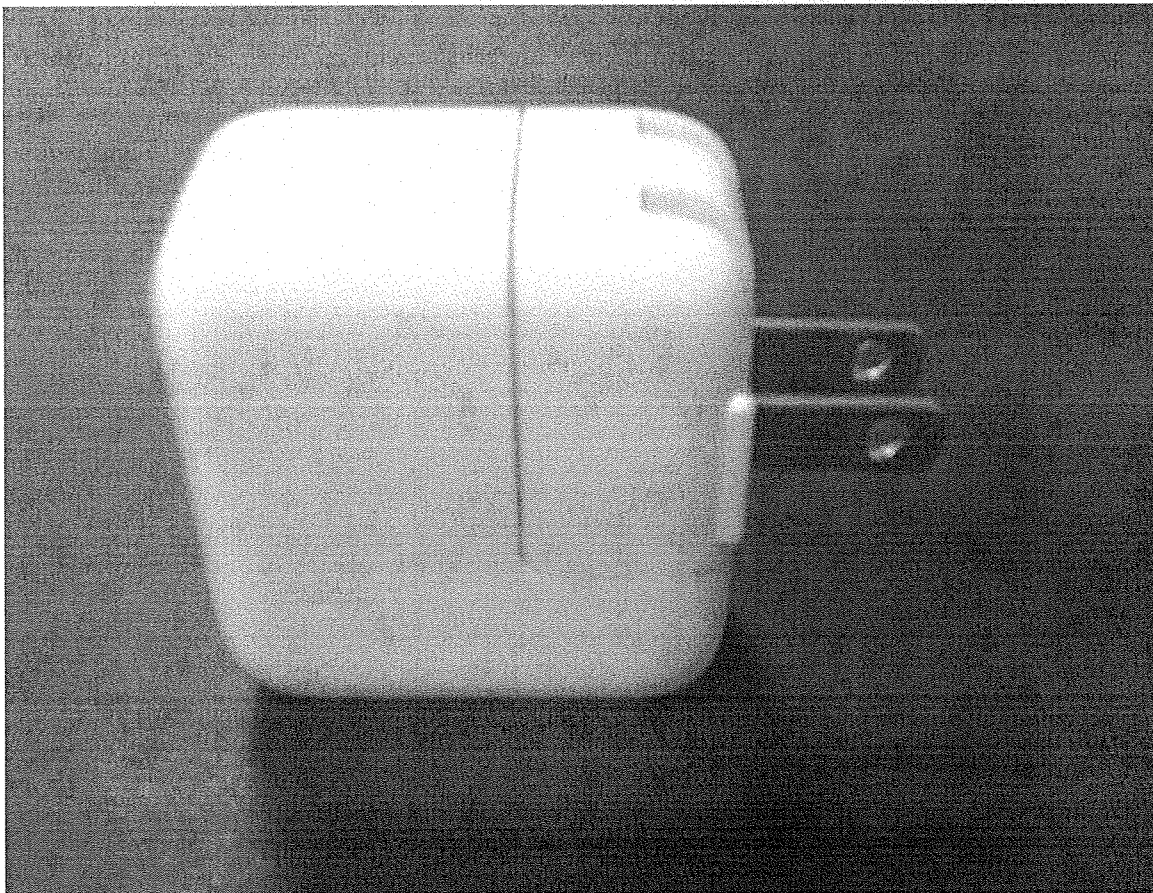
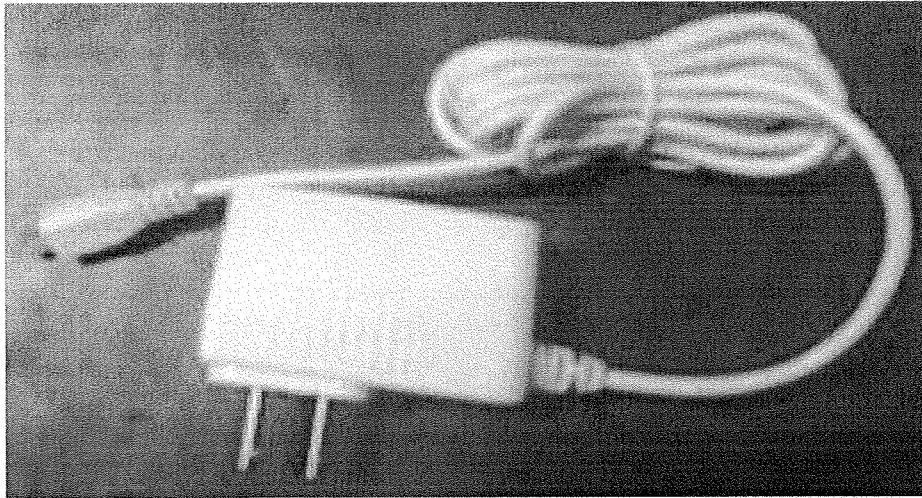
Without action before February 10, 2016, SSL drivers would be left in the EPS final rule and will be disruptive for the transition to more energy efficient lighting in the market place, increasing costs for consumers. Manufacturer innovation has driven the cost of LED lighting products lower and is making them competitively attractive to consumers.

Solid State Lighting Drivers represent the next wave of lighting technology and capabilities, enabling smart buildings, industry facilities, and homes to reduce their costs, better consumer experiences in the retail industry, and even faster recovery times in hospitals by controlling the color and timing of the lights in recovery rooms. Additionally, investment in SSL technology is massive and ongoing. Anything that would slow this evolving and beneficial (i.e. highly efficient) technology would threaten additional investments.

Lastly, I want to especially want to thank Representative Ellmers (R-NC), Representative Dent (R-PA), Representative DeGette (D-CO), Representative Pompeo (R-KS), and Representative Matsui (D-CA) whose leadership is very much appreciated on this issue and quickly realized the need to resolve this issue.

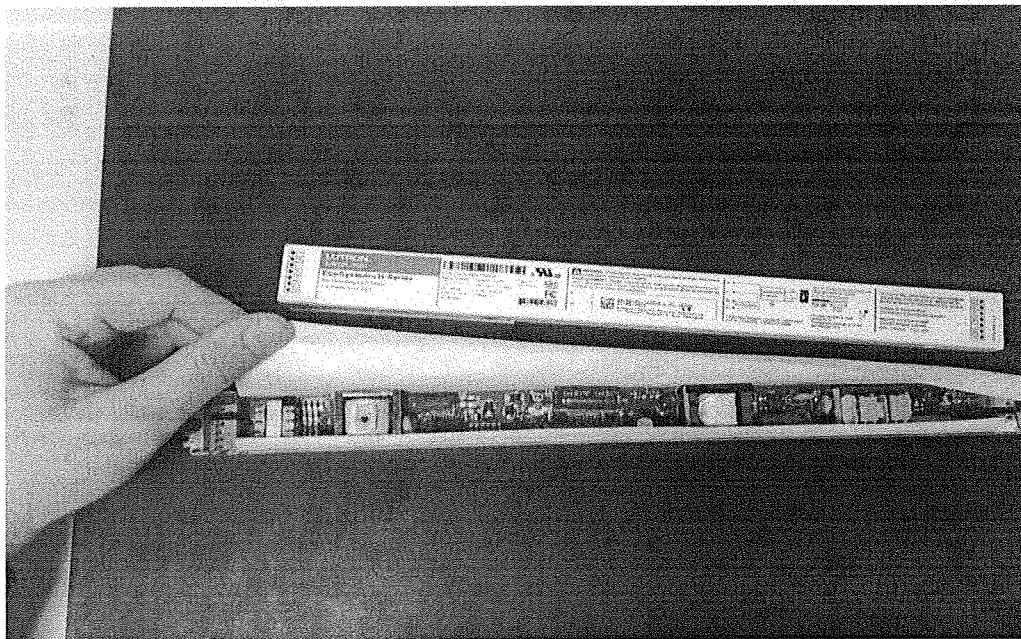
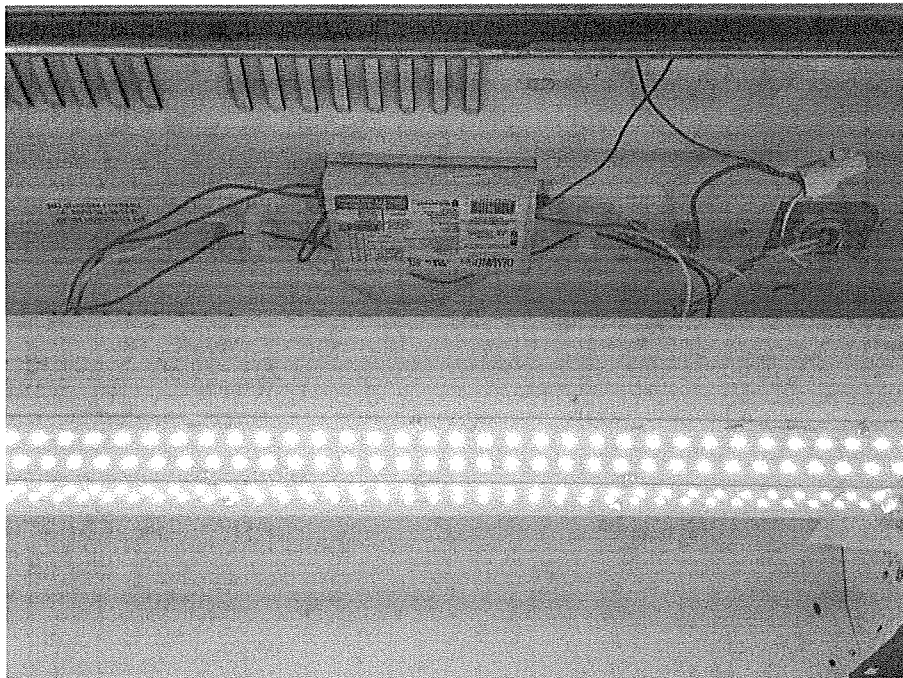
Thank you and I would be happy to answer any questions that you may have.

Attachment A: External Power Supplies



National Electrical Manufacturers Association
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Attachment B: Solid State Lighting Drivers



Attachment C: Letter of Support

November 30, 2015

The Honorable Fred Upton, Chairman
House Energy and Commerce Committee
2125 Rayburn House Office Building
Washington, DC 20515

The Honorable Frank Pallone, Ranking Member
House Energy and Commerce Committee
2322A Rayburn House Office Building
Washington, DC 20515

Dear Chairman Upton and Ranking Member Pallone,

We the undersigned companies and organizations represent the stakeholders who support standalone legislation which would exclude certain lighting technologies from the definition of the External Power Supplies (EPS) rulemaking and clarify the Department of Energy's existing authority for these technologies. This issue is timely given that the requirements of the DOE rulemaking go into effect in February 2016. Enactment of new legislation is needed to ensure the marketplace is clear of confusion and consumers have access to the best technology available.

In the Energy Policy Act of 2005, Congress amended the Energy Policy and Conservation Act (EPCA), 42 U.S.C. §6291 et seq., and directed the Department of Energy to establish energy conservation standards for EPS. As the DOE has noted on its own website, the focus was on products that "convert household electric current into direct current or lower-voltage alternating current to operate a consumer product such as a laptop computer or smartphone."¹ Subsequent to the 2005 congressional amendment, the lighting industry began introducing light-emitting diode (LED) technology to the market and certain power supplies or LED drivers designed to be connected to LEDs and organic LEDs, that were not in the market in 2005 or in the congressional line of sight at the time, began to look like EPS. In a 2014 rulemaking, DOE determined that certain of these LED drivers or power supplies met the congressional definition of EPS and included them in the regulation.

We ask that your committee and Congress pass legislation to exclude LED and OLED drivers from the EPS definition. If the definition is not changed by statute, the DOE EPS final rule will cause confusion and regulatory burden for manufacturers of certain LED drivers in the marketplace, which by themselves currently consume a relatively small amount of electricity, disrupting the transition to more energy efficient lighting, and increase energy use and costs for consumers. In the future, the Department of Energy may use its authority to propose energy conservation standards for LED/OLED drivers, but the current EPS rule is neither the time nor the rule to regulate these products.

Should you have further questions on this issue please contact Joseph Eaves, Director of Government Relations, at joseph.eaves@nema.org.

Sincerely,
Acuity Brands Lighting
Alliance to Save Energy (ASE)
American Council for an Energy-Efficient Economy (ACEEE)
Appliance Standards Awareness Project (ASAP)
Atlas Lighting Products
Big Ass Solutions

¹ https://www1.eere.energy.gov/buildings/appliance_standards/product.aspx/productid/23

Eaton Corporation
EYE Lighting International
Focal Point LLC
Leviton Manufacturing Company
Lutron Electronics
National Electrical Manufacturers Association (NEMA)
National Resources Defense Council (NRDC)
OSRAM SYLVANIA
Philips Lighting
Universal Lighting Technologies
Venture Lighting

Testimony of Jennifer Amann

Buildings Program Director

American Council for an Energy-Efficient Economy (ACEEE)

To the House Energy and Commerce Committee, Subcommittee on Energy and Power

Hearing on H.R. _____, the EPS Improvement Act of 2016

January 12, 2016

Summary

National appliance and equipment efficiency standards are a proven energy-saving policy. ACEEE estimates that efficiency standards saved 5.4 quadrillion Btu (quads) of energy in 2014 alone—roughly 5% of total U.S. energy in that year. Standards enacted to date will save consumers and businesses more than \$1.1 trillion through 2035.

The Energy Independence and Security Act of 2007 (EISA) established a standard for external power supplies (EPS) and instructed DOE to complete future rulemakings to revise the standards as warranted. The standard, based on those adopted in a number of states, became effective in 2008. DOE estimates the standard will save approximately 3.8 quadrillion Btu (quads) of energy—equivalent to the total annual energy consumption of the state of Pennsylvania—and yield \$42.4 billion in energy bill savings for products shipped from 2008-2032. A revised EPS standard takes effect in February 2016.

At the time that EISA was enacted, solid state lighting (SSL)—primarily LED lighting—was in its infancy for general service lighting applications. Today, a wide variety of high-efficiency SSL products are available. SSL products use power supplies, also known as SSL drivers, to power LED lighting. The broad definition of EPS in EISA captures the power supplies used with SSL, but for technical reasons detailed below these products cannot be shown to comply with the required EPS standard.

The bill under consideration would exempt those EPS products that are used to power LED lighting products from the existing EPS standards while ensuring that DOE retains the authority to set standards for these products in the future. ACEEE is satisfied with this outcome because it removes a potential obstacle to the continued growth of a leading energy efficiency technology while preserving DOE's ability to develop a standard on power supplies for these products in the future if warranted.

Introduction

My name is Jennifer Amann and I am the Buildings Program Director for the American Council for an Energy-Efficient Economy (ACEEE), a nonprofit organization that acts as a catalyst to advance energy efficiency policies, programs, technologies, investments, and behavior. We were formed in 1980 by energy researchers. Personally, I have been involved in energy efficiency issues for the past 20 years with a focus on energy efficiency in buildings, appliances, and equipment including lighting and electronics, the subjects of today's hearing.

National appliance and equipment efficiency standards are a proven energy-saving policy. The first standards were established in 1987 (signed by President Reagan) and subsequent standards enacted by Congress in 1988, 1992, 2005 and 2007. The Department of Energy (DOE) has updated many of the initial standards set by Congress. ACEEE estimates that efficiency standards saved 5.4 quadrillion Btu (quads) of energy in 2014 alone—roughly 5% of total U.S. energy in that year. Standards enacted to date will save consumers and businesses more than \$1.1 trillion through 2035.

History of External Power Supply Standard

External power supplies (EPS), also known as power adapters, are the small boxes on the cord of many small or portable electronic devices such as laptop computers, tablets, modems, computer speakers, and cordless and cell phones. EPS are also used with many small appliances and other household devices. Power supplies convert household electric current (around 120 volts in the United States) to the lower AC or DC voltages on which many electronic products operate. According to DOE, annual EPS shipments number about 345 million units.

In the 1990s, with the emergence of low-cost chips and portable electronics, new EPS technologies were developed that significantly reduced EPS size while offering better performance and improved energy efficiency. Despite these advances, it was not uncommon to find electronics, small

appliances, and other devices sold with bulky EPS utilizing mid-20th century technologies into the mid-2000s. A standard for EPS would effectively capture savings from new power supply technologies across the broad spectrum of products that utilize EPS more efficiently than establishing separate standards for each individual class of product. The Energy Independence and Security Act of 2007 (EISA) established a standard for EPS with the support of manufacturers and the energy efficiency community and instructed DOE to complete future rulemakings to revise the standards as warranted. The standard, based on those adopted in a number of states, became effective in 2008. The 2008 standard includes active mode efficiency requirements as well as a maximum standby power consumption of 0.5W. DOE estimates the standard will save approximately 3.8 quadrillion Btu (quads) of energy—equivalent to the total annual energy consumption of the state of Pennsylvania—and yield \$42.4 billion in energy bill savings for products shipped from 2008-2032.

In February 2014, DOE published a final rule revising the efficiency requirements for EPS and expanding coverage to additional types of EPS. The new standards, effective in February 2016, will reduce EPS energy use by 30-85%, depending on the type of device. DOE estimates the new standard will save an additional 0.3 quads of energy and yield consumer energy bill savings of approximately \$3.8 billion.

The EPS Standard and Issues for Solid State Lighting

At the time that EISA was enacted, solid state lighting (SSL)—primarily LED lighting—was a relatively new technology and very much in its infancy for general service lighting applications. There were few SSL products on the market other than for niche applications. Today, a wide variety of SSL products are available, market share is growing rapidly, and the efficiency of the technology now surpasses that of other light sources making it a very important contributor to reducing national electricity use.

SSL products use power supplies, also known as SSL drivers, to power LED lighting. The broad definition of EPS in EISA captures the power supplies used with SSL, but the products are somewhat different from other products using EPS. Of particular note, these products do not perform and cannot be tested when disconnected from a power-using load and therefore cannot be shown to comply with the “no load” portion of the EPS standard and, as a result, cannot be shown to meet the required EPS standard.

The bill under consideration would exempt those EPS products that are used to power LED lighting products from the existing EPS standards while ensuring that DOE retains the authority to set standards for these products in the future. If it is determined that there are wasteful LED power supplies on the market, DOE can develop an appropriate test method and standard for these specific products. The provision in the bill explicitly granting DOE authority to set future standards on these products is critical to ACEEE’s support for the bill. Absent passage of this technical correction, manufacturers would be at risk of selling LED lighting products that cannot be shown to meet the standard. ACEEE is satisfied with this outcome because it removes a potential obstacle to the continued growth of a leading energy efficiency technology while preserving DOE’s ability to develop a standard on power supplies for these products in the future if warranted.

This concludes my testimony. Thank you for the opportunity to present these views.