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DISCUSSION DRAFT OF THE EPS IMPROVEMENT ACT OF 2016

HEARING

BEFORE THE

SUBCOMMITTEE ON ENERGY AND POWER

OF THE

COMMITTEE ON ENERGY AND COMMERCE
HOUSE OF REPRESENTATIVES

ONE HUNDRED FOURTEENTH CONGRESS

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DISCUSSION DRAFT OF THE EPS IMPROVEMENT ACT OF 2016

TUESDAY, JANUARY 12, 2016

HOUSE OF REPRESENTATIVES,
SUBCOMMITTEE ON ENERGY AND POWER,
COMMITTEE ON ENERGY AND COMMERCE,
Washington, DC.

The subcommittee met, pursuant to call, at 10:03 a.m., in room 2322 Rayburn House Office Building, Hon. Ed Whitfield (chairman of the subcommittee) presiding.

Members present: Representatives Whitfield, Shimkus, Latta, Harper, McKinley, Ellmers, Flores, Mullin, Hudson, McNerney, Tonko, Engel, Green, Capps, Welch, Loebsack, and Pallone (ex officio).

Also present: Representative DeGette.

Staff present: Nick Abraham, Legislative Associate, Energy and Power; Will Batson, Legislative Clerk; Leighton Brown, Press Assistant; Allison Busbee, Policy Coordinator, Energy and Power; Rebecca Card, Assistant Press Secretary; Patrick Currier, Senior Counsel, Energy and Power; A.T. Johnston, Senior Policy Advisor; Dan Schneider, Press Secretary; Jennifer Berenholz, Democratic Chief Clerk; Christine Brennan, Democratic Press Secretary; Jeff Carroll, Democratic Staff Director; Rick Kessler, Democratic Senior Advisor and Staff Director, Energy and Environment; and Alexander Ratner, Democratic Policy Analyst.

OPENING STATEMENT OF HON. ED WHITFIELD, A REPRESENTATIVE IN CONGRESS FROM THE COMMONWEALTH OF KENTUCKY

Mr. WHITFIELD. I would like to call the hearing to order this morning, and today's hearing is going to be on the EPS Improvement Act of 2016. And I will introduce our witnesses after we have an opportunity to make an opening statement.

But this hearing this morning is going to be focused on our efforts to correct a little glitch in the 2005 Energy Policy Act relating to external power sources and solid state liquid lighting systems.

[The prepared statement of Mr. Whitfield follows:]

PREPARED STATEMENT OF HON. ED WHITFIELD

The Obama administration Department of Energy has enacted 34 energy conservation standards since 2009. Many of these standards are not perfect and contain flaws that need to be corrected. We have included a few such bipartisan corrections in our recent energy bill, and today we address another one affecting light emitting diodes, or LEDs. I thank my colleagues Renee Ellmers and Diana DeGette for their

draft bill that would address this issue and benefit both the manufacturers and users of these products.

By way of background, the Energy Policy Act of 2005 required DOE to set energy conservation standards for external power supplies, such as the ones we use to plug in our laptops and cell phones, but DOE also included devices that power solid state lighting products, also known as LEDs, for purposes of regulation. The latest standards will take effect next month. However, the statutory definition of an external power supply was created back in 2005, and this old language did not anticipate the subsequent development of LEDs.

LED systems contain components that DOE has determined fit within the broad definition of an external power supply, but in reality these lighting technologies have several unique characteristics that make compliance with DOE's new standard nearly impossible. I might add that LEDs have many advantages, so a DOE rule that makes it harder to produce them would be counterproductive to the statute's efficiency goals.

The EPS Improvement Act of 2016 scales back the external power supply rule in order to preserve the market for LED products. While keeping the efficiency standard in place for most external power supplies, it creates a specific exemption for LEDs. In addition, the law authorizes DOE to enact a subsequent, more appropriate standard targeting LEDs if the agency deems it necessary.

Manufacturers and energy efficiency advocates agree that this change makes sense, and we will hear from representatives of both groups today.

Let's kick off 2016 by making one DOE regulation more workable for those who make their livelihoods from LEDS as well as those who use them.

[The proposed legislation appears at the conclusion of the hearing.]

Mr. WHITFIELD. And at this time I am going to call on Renee Ellmers to give her opening statement. She and Diana together, it is their bill, and I want to give them an opportunity to talk about it.

OPENING STATEMENT OF HON. RENEE L. ELLMERS, A REPRESENTATIVE IN CONGRESS FROM THE STATE OF NORTH CAROLINA

Mrs. ELLMERS. Thank you, Chairman Whitfield, so much for this opportunity and for holding this hearing today, and I want to thank our panel for being here as well. There are many people who have been working on this issue trying to correct the glitch in the regulations, coming up and helping to draft this legislation and make this hearing possible.

First, I would like to thank my colleagues, Mike Pompeo, Diana DeGette, Doris Matsui, and Charlie Dent, and their staff for their support and hard work throughout this process. Finally, but most importantly, Mr. Chairman, I would like to thank the committee staff itself. You have put up a great teamwork together on this issue and you have been wonderful in working with my staff and throughout this whole process. I am truly thankful and grateful for their time and effort.

The EPS Improvement Act of 2016 is a bipartisan and commonsense bill that would provide certainty to manufacturers and resolve the underlying issues of the DOE external power supply rule. In 2005, Congress directed the Department of Energy to develop energy efficiency standards for external power supplies and they developed a definition for EPS devices. DOE stated that the products that were intended to be covered by these standards, quote, convert household electric current into DC or lower power voltage to AC to operate consumer products such as laptop computers or smart phones. And that is pretty much the plan.

Years after the passage of the Energy Policy Act of 2005, new technologies arose such as OLED and LED drivers were introduced into the marketplace. We all know how quickly technology is advancing, and innovation. While the development of this technology increased energy efficiency, it has also caused uncertainty in the manufacturing sector as DOE roped in drivers as products to also be covered.

DOE is now attempting to regulate a product that was not in the marketplace at the time Congress initially directed the Department to set external power supply standards. Both manufacturers and the energy efficiency community agree that this was not the intent of Congress, as LED and OLED drivers were not in the marketplace in 2005 when Congress directed DOE to develop these standards. DOE has continued with this misguided rule despite the distinct differences in the design and use of LED drivers to that of the design and use of EPS.

One example of the differences is that EPS use single stage power conversion while LED drivers use a two stage power conversion. Thankfully, this legislation resolves the problem by excluding SSL drivers for this technology and prevents it from being included in other broad rulemaking. This regulation will not only stifle innovation but inject uncertainty into the manufacturing sector while creating less energy-efficient products and higher energy prices for consumers.

Without congressional action by February 10th of this year, this rule could unintentionally threaten thousands of jobs. I look forward to hearing from our witnesses, and with that, Mr. Chairman, I yield back.

Mr. WHITFIELD. Well, thank you, Mrs. Ellmers, very much. We appreciate that. And at this time I would like to recognize the gentleman from California, Mr. McNerney, for 5 minutes.

OPENING STATEMENT OF HON. JERRY MCNERNEY, A REPRESENTATIVE IN CONGRESS FROM THE STATE OF CALIFORNIA

Mr. MCNERNEY. Well, thank you, Mr. Chairman. We are here today to hold the legislative hearing on the External Power Supply, or EPS, Improvement Act, which addresses an important issue for LED innovation, manufacturers and future investments in this exciting industry. The EPS Improvement Act would exempt electrical drivers that power solid state lighting products from the Department of Energy's energy conservation standard for external power supplies.

This targeted bill sponsored by my colleagues Renee Ellmers and Diana DeGette would amend the Energy Policy and Conservation Act to exclude LED drivers from standards that go into effect on February 10th of this year. Energy efficiency standards are important as they save consumers money on their energy bills and reduce greenhouse gas emissions.

It is estimated that the national appliance and equipment efficiency standards have saved, believe it or not, 5.4 quadrillion BTUs of energy in 2014 alone. The standards enacted to date will save consumers and businesses more than $1.1 trillion through 2035—I see heads nodding here—and the technology innovation spurred

by these standards is critical. We need to support innovation to address climate change with energy efficiency and renewable technology.

My Grid Innovation Caucus co-chairwoman, Congresswoman Ellmers, and I believe that we must promote technologies that help us adopt to our growing energy needs and provide additional options for consumers, businesses and the economy. And we must use the energy standards in a manner that does not confuse the market. At the time the Energy Policy and Conservation Act was amended, LED drivers were an emerging technology but they still fell under the broad definition of an external power supply. LED drivers represent the next wave of lighting technology and capabilities enabling smart buildings, industry facilities and homes and reduce their costs and enhance their performance.

Investments in LED driver technology are robust and ongoing; new standards at this time could slow down additional investments. Leaving LED drivers in the EPS final rule could hinder the transition to more energy-efficient lighting in the marketplace and increase energy use and the cost for consumers.

This legislation, however, does not grant the Department of Energy the authority to prescribe energy conservation standards down the road, or it does grant—excuse me—the DOE the authority to prescribe energy conservation standards down the road so that it can implement more appropriate standards for the LED industry when the time is appropriate.

I support this EPS Improvement Act because it clarifies congressional intent by clarifying the statutory definition of external power supplies to exclude LED drivers. This measure was developed in consultation with the DOE and is supported by industry stakeholders. We should provide LED manufacturers market stability so they are able to improve technology that has already been demonstrated in its ability to increase energy efficiency in consumer and commercial applications.

I thank our witnesses for joining us today and look forward to hearing your testimony. Thank you, and I yield back.

Mr. WHITFIELD. Thank you very much, Mr. McNerney. Mr. Upton is not here this morning. Is there anyone else on our side of the aisle that would like to make a comment about this hearing, the subject matter of this hearing? If not, then I will recognize the gentleman from New Jersey, Mr. Pallone, for 5 minutes.

OPENING STATEMENT OF HON. FRANK PALLONE, JR., A REPRESENTATIVE IN CONGRESS FROM THE STATE OF NEW JERSEY

Mr. PALLONE. Thank you, Mr. Chairman. I want to thank you and the ranking member of the subcommittee for holding today's legislative hearing on the EPS Improvement Act of 2010. This bill authored by Representatives Ellmers and DeGette would exempt LED consumer light bulbs from new mandatory efficiency standards for external power supplies. And the development of LED light bulbs has been an energy efficiency success story and I am concerned about any action no matter how well intentioned that might interfere with that success.

More than a decade ago, Congress amended the Energy Policy and Conservation Act to set efficiency standards for external power supplies. An external power supply, or EPS, is typically used to convert household electric current to help operate consumer products. For most Americans that means the big plugs that are associated with laptop computers, home cordless phones, answering machines and the like. As part of this regulation, the DOE has moved forward on a plan to include power drivers for solid state lighting which are an integral part of highly efficient LED replacement light bulbs. In its comments with stakeholders it is clear that DOE needs statutory authority to alter the law's definitions.

Meanwhile, the National Electrical Manufacturers Association argued that Congress didn't intend to cover consumer LED light bulbs when it enacted EPACT 2005, or when it amended the law in the 2007 Energy Independence and Security Act. I am inclined to agree that Congress did not intend to capture LED light bulbs in the 2014 rule. The regulation of EPSs has been discussed at length both in this committee and within the stakeholder community. Never once had LED light bulbs been contemplated; instead, the discussion was focused on television sets, computers and stereo equipment.

So it is clear to me, however, that Congress' multiple efforts to legislate in this area over a short time frame has added confusion rather than clarity to the statute who explicitly carved out some things like medical devices from the definition of an EPS, but we did not carve out LED light bulbs. I think that had we known more about the workings of LED light bulbs at the time we would have exempted them specifically from mandatory efficiency standards from the start.

So right now, a modern LED light bulb that replaces the kind of 60-watt light bulb we used in the last century will only consume nine watts of power to produce the same amount of light, last for a decade, and sells for as little as $3.99. That is a great deal for any consumer and I see no benefit to the consumer, the environment or the economy from regulating the efficiency of these light bulbs at this time.

I am encouraged by today's legislative hearing to put this issue in perspective and I am hopeful we can work together to expeditiously move this bill forward. And I would just like now to yield the balance of my time to the lead sponsor of the legislation, the gentlewoman from Colorado, Ms. DeGette.

[The prepared statement of Mr. Pallone follows:]

PREPARED STATEMENT OF HON. FRANK PALLONE, JR.

I want to thank the chair and ranking member of the subcommittee for holding today's legislative hearing on the EPS Improvement Act of 2016. This bill, authored by Reps. Ellmers and DeGette, would exempt LED consumer light bulbs from new mandatory efficiency standards for external power supplies. The development of LED light bulbs has been an energy efficiency success story and I'm concerned about any action, no matter how well-intentioned, that might interfere with that success.

More than a decade ago, Congress amended the Energy Policy and Conservation Act to set efficiency standards for external power supplies. An external power supply, or EPS, is typically used to convert household electric currents to help operate consumer products. For most Americans that means the big plugs that are associated with laptop computers, home cordless phones, answering machines and the like.

As a part of its regulations the DOE has moved forward on a plan to include power drivers for solid state lighting, which are an integral part of highly efficient LED replacement light bulbs. In its comments with stakeholders, it's clear that DOE needs statutory authority to alter the law's definitions. Meanwhile, the National Electrical Manufacturer's Association argued that Congress didn't intend to cover consumer LED light bulbs when it enacted EPACT 2005 or when it amended the law in the 2007 Energy Independence and Security Act.

I'm inclined to agree that Congress did not intend to capture LED light bulbs in that 2014 rule. The regulation of EPSs had been discussed at length both in this committee and within the stakeholder community. Never once had LED light bulbs been contemplated. Instead, the discussion was focused on television sets, computers, and stereo equipment.

It's clear to me, however, that Congress' multiple efforts to legislate in this area over a short time frame has added confusion, rather than clarity, to the statute. We explicitly carved out some things like medical devices from the definition of an EPS, but we did not carve out LED light bulbs. I think that had we known more about the workings of LED light bulbs at the time, we would have exempted them specifically from mandatory efficiency standards from the start.

Right now, a modern LED light bulb that replaces the kind of 60 watt light bulb we used in the last century, will only consume 9 watts of power to produce the same amount of light, last for a decade and sells for as little as $3.99. That's a great deal for any consumer and I see no benefit to the consumer, the environment or the economy from regulating the efficiency of these light bulbs at this time.

I am encouraged by today's legislative hearing to put this issue into perspective and I'm hopeful we can work together to expeditiously move this bill forward.

Thank you, and I yield the balance of my time to the lead Democratic sponsor of the legislation, the gentlelady from Colorado, Ms. DeGette.

Ms. DEGETTE. Thank you very much for yielding to me, Ranking Member Pallone. I am really proud to be leading this bill with Representative Ellmers, truly working across the aisle, literally, today. And as has been said, this bill will allow the Department of Energy to provide, to prescribe a separate energy conservation standard for LED drivers.

As we have been discussing, when this committee wrote the Energy Policy and Conservation Act of 2005 it directed the Department of Energy to develop a conservation standard for various external power supply products. That term was meant to cover products that convert household electric current in order to operate a consumer product like a laptop computer or a smart phone.

At that time in 2005, LED lighting was in its very early stages. And as much we try and often succeed, we didn't have a crystal ball to see into the future of LED lighting. So since that time because of the broad definition we created for external power supplies, emergent LED drivers were swept up into a conservation standard that just doesn't make sense. This means that, although LED drivers are highly energy-efficient, they can't meet the EPS conservation standard and their ability to compete in the competitive lighting market is now an open question.

Well, it seems like a technicality, but the bill is actually vitally important. LED drivers represent the next wave of lighting technology allowing for better and faster Internet connections, enabling smart buildings, industry facilities and homes to reduce their costs, improving consumer experiences in the retail industry and even leading to even faster recovery times in hospitals by controlling the color and timing of the lights in recovery rooms.

It is estimated that switching to LED lighting could reduce national lighting electricity use by nearly one half by 2030. That is the annual equivalent to saving three quadrillion BTUs, which is worth $26 billion in today's standards. So by passing the EPS Im-

provement Act of 2016 will let the LED lighting revolution continue, and in turn help lower energy prices for every American business.

I want to thank the panelists for coming today. I look forward to your testimony, and I yield back.

Mr. WHITFIELD. That concludes our opening statements. And before I introduce our panel of witnesses I do want to thank both the Democratic and Republican staff, certainly Diana DeGette and Renee Ellmers for working together on this important legislation. And we appreciate very much the National Electrical Manufacturers Association and the American Council for an Energy-Efficient Economy helping us to craft this legislation.

And we are delighted that we have two witnesses here today representing those organizations. First of all, we have Jennifer Amann who is the Buildings Program director at the American Council for an Energy-Efficient Economy, and then we have Dr. Pekka Hakkarainen who is vice president of Lutron Electronics. I think they are from Pennsylvania, I believe. And you are testifying on behalf of the National Electrical Manufacturers Association.

So we appreciate both of you being with us this morning, and we look forward to your opening statement and your expertise in this area. And with that Ms. Amann, I will recognize you for your 5-minute opening statement.

STATEMENTS OF JENNIFER AMANN, BUILDINGS PROGRAM DIRECTOR, AMERICAN COUNCIL FOR AN ENERGY–EFFICIENT ECONOMY, AND PEKKA HAKKARAINEN, PH.D., VICE PRESIDENT, LUTRON ELECTRONICS, ON BEHALF OF THE NATIONAL ELECTRICAL MANUFACTURERS ASSOCIATION

STATEMENT OF JENNIFER AMANN

Ms. AMANN. My name is Jennifer Amann, and I am——

Mr. WHITFIELD. Amann, I am sorry. Be sure and turn your microphone on.

Ms. AMANN. I am the Buildings Program director for the American Council for an Energy-Efficient Economy, or ACEEE. We are 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 and signed into law by President Reagan. ACEEE estimates that efficiency standards saved 5.4 quadrillion BTUs, or quads, of energy in 2014 alone. That is roughly five percent of total U.S. energy use in that year. Standards enacted to date will save consumers and businesses more than $1.1 trillion through 2035.

External power supplies, or EPS, are also known as power adapters, the small boxes on the cord of many small or portable electronic devices such as laptop computers, modems, cordless and cell

phones. According to DOE, annual shipments of these products number about 345 million units.

In the 1990s, with the emergence of low-cost chips and portable electronics, new EPS technologies were developed to significantly reduce the size of the products while offering better performance and improved energy efficiency. A standard for EPS would capture savings from new power supply technologies across all of the broad spectrum of products that utilize external power supplies much more effectively than establishing separate standards for each of the types of products, individual classes of products that use them.

The Energy Independence and Security Act of 2007 established the first standard for external power supplies which took effect in 2008, and it also instructed DOE to complete future rulemakings to revise the standard as warranted. DOE estimates the standard, the initial standard, will save approximately 3.8 quads—that is equivalent to the total energy consumption of the State of Pennsylvania—and yield $42.4 billion in energy savings for products shipped from 2008 to 2032.

In February of 2014, DOE published a final rule revising the efficiency requirements for external power supplies, and these new standards take effect this February and they will reduce EPS energy use by 30 to 85 percent depending on the type of device. The new standard will yield consumer energy bill savings of approximately $3.8 billion. So the EPS standard has been very effective in achieving the intended objectives of the rule.

But at the time that EISA was enacted, solid state lighting was very much in its infancy for general service lighting applications. There were few products on the market other than for niche applications. Today, a wide variety of solid state lighting 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.

Solid state lighting products use power supplies, or SSL drivers, to power LED lighting. The broad definition of EPS in EISA captures, or in the Energy Policy Act captures the power supplies used with solid state lighting, but the products are somewhat different from other products using EPS. And of particular note, these products do not perform and cannot be tested when disconnected from a power using load, so they can't be shown to comply with some portions of the standard, and as a result the required efficiency requirements.

The bill under consideration would exempt those external power supplies that are used to power these 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 then 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 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 the outcome in this bill 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 and I thank you for the opportunity to present these views.

[The prepared statement of Ms. Amann follows:]

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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.

Mr. WHITFIELD. Well, thank you very much. And Dr. Hakkarainen, you are recognized for 5 minutes.

STATEMENT OF PEKKA HAKKARAINEN

Dr. HAKKARAINEN. Good morning, Chairman Whitfield and Congressman McNerney and members of the committee. My name is Pekka Hakkarainen. I am vice president at Lutron. I have been employed there for 25 years.

I want to first thank the committee for giving me the opportunity to testify on the EPS Improvement Act. The bill before you fixes a needed technical issue with the Department of Energy's February 2014 EPS energy conservation standard that goes into effect on February 10th of this year. I am here today testifying on behalf of Lutron Electronics and the National Electrical Manufacturers Association.

A number of NEMA's members who manufacture and distribute solid state LED lighting products are impacted by the DOE external power supply standard. My company Lutron Electronics is a privately held manufacturer founded in 1961 and is headquartered in Coopersburg, Pennsylvania. Our products range from consumer dimmers to motorized window shades to lighting management systems for both residential and commercial buildings, and they also include LED drivers. And we estimate that in the U.S. alone, our products save about $1 billion a year in consumer electricity bills.

In 2005, Congress amended the Energy Policy and Conservation Act to define and direct the Department of Energy to set standards for external power supplies, such as this device that I am holding here. An external power supply was defined as a device, a circuit that is used to convert household electric current into DC current or low 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 as it says convert household electric current to operate a consumer product such as a laptop computer or a smart phone or an answering machine, et cetera. However, given the broad definition in EPACT 2005, additional products were brought into the definition of a covered product via the DOE rulemaking process.

In 2014, DOE issued a final rule for the latest round of standards for external power supplies. Despite Lutron and other companies asking in writing and in public meetings for the Department to clearly identify what types of products impacting lighting technologies might be covered as external power supplies, no clear answer was provided until the final rule was issued. The final rule includes as regulated EPS certain drivers for solid state lighting products, such as perhaps this one, which industry and the efficiency community agree were never intended by Congress to be considered external power supplies.

The EPS Improvement Act resolves this unintended consequence by amending and clarifying the statutory definition of external power supply to exclude solid state lighting drivers that are de-

signed to be connected to and power light-emitting diodes, LEDs, or organic light-emitting diodes, OLEDs that provide illumination. The bill then restates the conditions under which the DOE could undertake a rulemaking in the future for solid state drivers subject to current statutory requirements. Furthermore, the language also requires that DOE make public the testing procedure requirements for at least a year before any 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 manufacturers and the energy efficiency community. And the same language has already passed the House by a voice vote as an amendment to H.R. 8, the North American Energy Security and Infrastructure Act of 2015.

Without action before February 10th, solid state drivers would be left in the EPS final rule which would be disruptive for the transition to more energy-efficient lighting in the marketplace. As has already been stated, LED drivers represent the next wave of lighting technology and capabilities, and significant investment in this technology is ongoing in industry. Anything that would slow this evolving and beneficial technology would threaten additional investment.

I want to, lastly, especially thank Representatives Ellmers, Dent, DeGette, Pompeo, and Matsui whose leadership is very much appreciated on this issue. Thank you, and I would be happy to answer any questions.

[The prepared statement of Dr. Hakkarainen follows:]

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 (EPAct 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 EPAct 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 DOEs 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.

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

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:

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 EPACT 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.

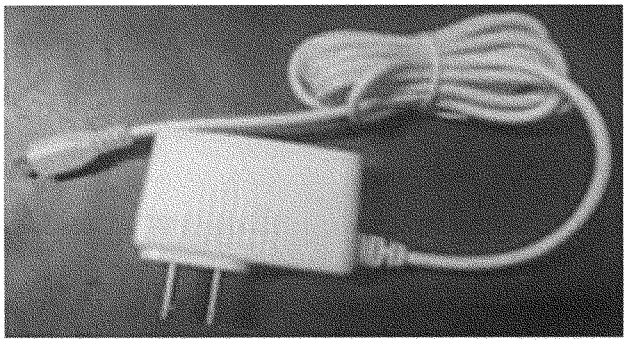
Solid State Lighting Drivers represent the next wave of lighting technology and capabilities, enabling smart buildings, industry facilities, and homes to reduce their costs, better consumer experiences in the retail industry, and even faster recovery times in hospitals by controlling the color and timing 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.

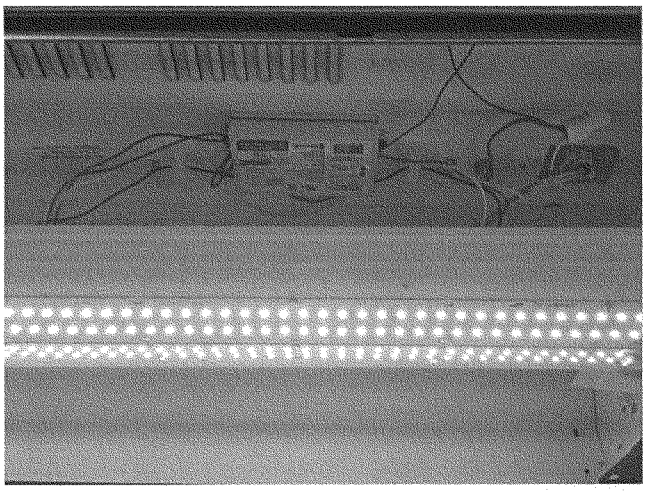
Thank you and I would be happy to answer any questions that you may have.

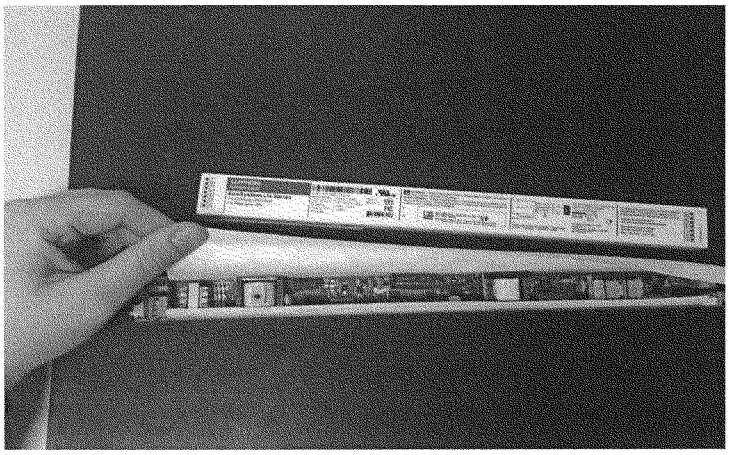
National Electrical Manufacturers Association
1300 North 17th Street, Suite 900 - Rosslyn, VA 22209

Attachment A: External Power Supplies



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

Mr. WHITFIELD. Well, thank you for your testimony. We appreciate it, as I said earlier, both of you being here today, and it is encouraging that when you get to a technical issue that the parties can come together and try to move expeditiously.

And one of the questions I would have for both of you, I have not had an opportunity to talk to Ms. DeGette or Mrs. Ellmers about it, but we do believe that we ought to pass this legislation through the House rather quickly, maybe even on suspension. And I was just curious, have you all been working on the Senate side at all about moving the bill over there? Whoever would like to respond to that.

Dr. HAKKARAINEN. Yes, we have been working on the Senate side. My colleagues from NEMA would be better experts on where exactly we stand over there.

Mr. WHITFIELD. OK.

Ms. AMANN. And I would say yes, we are just aware that there are efforts going on in the Senate. We haven't been as active as we are supporting the manufacturers' efforts in showing out support for it, but we are——

Mr. WHITFIELD. OK, good. Now, Dr. Hakkarainen, if February the 10th rolled by and this regulation did go into effect and we were not able to get this legislation passed, what would be the practical impacts on, say, Lutron Electronics?

Dr. HAKKARAINEN. There would be uncertainty as to whether the EPS rule affects LED drivers and which ones. The Department of Energy has not provided industry sufficient guidance on that issue, and we are here to ask for clarity.

Mr. WHITFIELD. Would that interfere with your ability to sell the product?

Dr. HAKKARAINEN. Quite probably would, yes.

Mr. WHITFIELD. OK. Yes.

Ms. AMANN. I would just say, so DOE has a process for companies to request a waiver if they are not able to follow the test procedures for a certain product, but that would be very time consuming and resource intensive for the manufacturers and for DOE to have to deal with those waiver applications.

Mr. WHITFIELD. I would like to just ask you sort of a generic question about the American Council for Energy-Efficient Economy. I know you are a nonprofit group and I know you are involved in policy issues. But I notice that you talk about advancing energy efficiency technologies and investments. I was just curious, how do you all go about doing that advancing new technologies and investments?

Ms. AMANN. Sure. So a lot of our work focuses on researching technologies and different mechanisms for bringing about energy efficiency, so on the investment side it could be financing options that increase the adoption of efficient technologies. So we look at, we keep an eye out on emerging technologies that are entering the market. We work closely with utilities and other efficiency program administrators that are spending billions of dollars a year on energy efficiency to help them identify the best opportunities, the best markets to spend their money in and to advance those technologies.

Mr. WHITFIELD. But do you actually help on investments, like obtaining money?

Ms. AMANN. Yes. We don't actually do any of that type of thing, but we do things like we hold every year an energy efficiency finance forum where we bring together folks in the finance community to talk about different types of like new loan structures, different types of financial mechanisms for increasing investment and energy efficiency.

Mr. WHITFIELD. And when will that be held this——

Ms. AMANN. This year it will be in May or maybe early June. It is May or early June, and it will be in Newport, Rhode Island.

Mr. WHITFIELD. OK. I yield back the balance of my time and recognize Mr. McNerney for 5 minutes.

Mr. MCNERNEY. Thank you, Mr. Chairman. It is ironic that the title "External Power Supply" should apply to LEDs, because when you buy an LED at the store for your home it is all internal. You don't get an external supply. Does that seem ironic to you, or am I missing something here?

Dr. HAKKARAINEN. So in this case we are not actually talking about the light bulb that has the internal driver. You are quite right that——

Mr. MCNERNEY. OK.

Dr. HAKKARAINEN [continuing]. Those are the consumer products, and they are not, in my understanding, affected by the EPS standards that the DOE has.

Mr. MCNERNEY. So we are talking about the LEDs that are inside of——

Dr. HAKKARAINEN. But it affects products such as this, a separate driver that goes into a, more like a commercial grade luminaire lighting fixture where the LED lamps or strips are separately installed by the luminaire manufacturer.

Mr. MCNERNEY. OK. Ms. Amann, are the DOE's energy conservation standards that come into effect in February inappropriately suited for regulating LED drivers?

Ms. AMANN. No, I don't believe so. It was never the intention of the law, I mean, of the rule to do that. And it was just an oversight, because these products weren't available in the market at that time. And so when I say that DOE estimates there are about 345 million power supplies sold each year, those are the external power supplies like this. And that is what DOE's analysis is based on and that is what the efficiency community and manufacturers first discussed when we made a recommendation to comment on standard levels——

Mr. MCNERNEY. Sure.

Ms. AMANN [continuing]. That were passed in 2007 under the EISA bill.

Mr. MCNERNEY. Well, how does the rule disrupt the development of a power supply? I don't understand how an efficiency rule would disrupt the development of a better power supply.

Ms. AMANN. So in this case because the technology for the solid state lighting driver is very different from the technology that is used in a standard external power supply, so the rule doesn't appropriately apply to this other technology.

For instance, for these products I think one of the big points is part of the standard establishes what we call a "no-load," a requirement for operation in no-load mode. So if you plug this into the

wall and you had your phone plugged into it, once you took your phone away this would still be drawing power and you could set it, put it on a power meter and understand how much power it drew.

That is not the case with the solid state lighting drivers. They can't operate in no-load mode at all. So you can't even test them under the rules as it is set out in the standard, so you can't show whether or not it can comply with the standard. And I would ask Pekka to correct me if I made any errors in my technical explanation, or if you could clarify anything.

Dr. HAKKARAINEN. No, that is fine.

Mr. MCNERNEY. So the standards, I mean it is apples and oranges. They don't really apply to the same kind of technology.

Ms. AMANN. That is right.

Dr. HAKKARAINEN. That is correct.

Mr. MCNERNEY. And that would really hinder the development because the investment would dry up and so on. So how does the EPS Improvement Act change that? Did I call it the right thing? How does the EPS Improvement Act change that?

Dr. HAKKARAINEN. It changes the situation for LED drivers because it excludes them from the definition of an external power supply, and then it further directs DOE in the future to develop separate standards for LED drivers.

Mr. MCNERNEY. So you believe that this actually removing a standard promotes stability and confidence in the market?

Dr. HAKKARAINEN. Correct.

Mr. MCNERNEY. OK. All right, Mr. Chairman, I yield back. Thank you.

Mr. WHITFIELD. The gentleman yields back. At this time I recognize the gentle lady from North Carolina, Mrs. Ellmers, for 5 minutes.

Mrs. ELLMERS. Thank you, Mr. Chairman, and again thank you to our panelists today on this issue. This is certainly something that I have become educated on recently as it affects some of our businesses back home in District 2 of North Carolina. And again I thank you for your expert testimony in helping us to understand what it is that we are dealing with and why. Although the legislation and the actions were well intended, to direct the Department of Energy as again kind of a good problem as technology has advanced so quickly we are finding ourselves in this situation where we now have to modify the path going forward.

So Dr. Hakkarainen, will you please take a moment to, and you did explain in your testimony the difference between the design and use of a typical EPS device compared to that of an OLED or LED driver or converter. Could you just expand on that a little bit more now?

Dr. HAKKARAINEN. Certainly. An external power supply such as this device here——

Mrs. ELLMERS. This is the example that I have been given as well, so——

Dr. HAKKARAINEN. It takes household electric current, 120 volts powered from a 120-volt supply, and converts it typically to a DC voltage, to five volts, nine volts, something like that. And there is a single stage of power conversion in that process. In an LED driv-

er there are two stages of power conversion. First, we convert from the AC power supply, which could be 120 volts but it is often actually 277 volts in commercial buildings, and converts that to a relatively high voltage DC power bus, as we say, inside the driver. And that is then further modulated to operate the LED lighting properly, to essentially to drive the LED lighting. So there are two stages of power conversion.

In addition, these modern LED drivers have other features as well, such as being connected to the external world, to the building infrastructure, to the Internet, for example. So there are additional features here that external power supplies typically don't have.

Mrs. ELLMERS. So again, and I have got mine as well. So this driver, basically, and we said converter, driver, actually does more than that. And so basically it is stationary. It is in the ceiling providing the power supply for the lights themselves, the LED lights.

And so I just want to touch on the issue of the commercial component to this, because to me one of the big issues here is the uncertainty that our manufacturers are experiencing, but then you can see how it impacts any commercial development and the cost as well. I mean, I could see that this could be very, very costly. Am I correct in that?

Dr. HAKKARAINEN. It would certainly be costly. I am not even certain that it would be possible.

Mrs. ELLMERS. Possible. And I did want to touch on that as well. I know Ms. Amann had discussed this, but basically as it is right now the way that the EPS rule stands there really isn't a way to have a standard test procedure; is that correct? And this will dramatically affect technology moving forward.

Dr. HAKKARAINEN. Correct.

Mrs. ELLMERS. Correct. And Dr. Hakkarainen, is it fair to say that by encompassing LED and OLED drivers into the final EPS rule that it could potentially, I mean, we are basically saying that this is going to be counterproductive to the whole process, correct?

Dr. HAKKARAINEN. Yes, that is correct, because if LED and OLED drivers are not available then the energy efficiency on buildings decreases.

Mrs. ELLMERS. Decreases. Well, I just, Mr. Chairman, I yield back. And again I thank the panel so much for their input and their testimony and your expert ability to help explain a very difficult technical process so that we can create better legislation and be working with our business communities. Thank you so much.

Mr. WHITFIELD. Mrs. Ellmers yields back, so at this time I would like to recognize Ms. Capps for 5 minutes.

Ms. CAPPS. Thank you, Mr. Chairman, for holding this hearing, and I am going to thank our witnesses for your testimonies.

Investing in and implementing technologies that embrace and improve upon energy efficiency is critical. It is clear that this is not a simple task. Improvements must be made in every sector of our lives from every day consumer products to industrial applications. This is exactly why Congress first enacted legislation on improving energy efficiency and established much needed conservation measures.

And one of the most important questions when it comes to energy efficiency is how we can provide ample energy-efficient and

cost-effective lighting for people all across the world. Our societies are built around an infrastructure that supports sufficient, affordable and reliable light.

Just as it is across the world, the pursuit of innovations and efficient lighting has been and continues to be important to my congressional district. In fact, the community in my district where I live, Santa Barbara, has been instrumental in the development of LED technology, as you both know. Shuji Nakamura is a professor in the materials science department at UC Santa Barbara, has spent decades working on LED technology including developing a process for producing the bright blue LED. And the blue LED in turn allowed for the development of the white LED, an incredibly efficient form of lighting that is changing the landscape of consumer and industrial lighting as we know it.

Recognizing the importance of this research, Professor Nakamura was awarded the Nobel Prize in physics in 2014 along with two other researchers. And my campus, the UC Santa Barbara, continues to lead the way in research into LED technologies.

Santa Barbara is also the home of the research lab for CREE, which is one of the market leading innovators of consumer LED technology. CREE was responsible for the production of the first LED that was appropriate for general consumer lighting and continues to lead the way in innovation production of energy-efficient LEDs.

Again my district has been at the forefront of accessible lighting around the world. For example, the Institute for Energy Efficiency at UC Santa Barbara has worked with the nonprofit Unite to Light to provide reading lamps to people across the world which replaces dangerous kerosene lamps with solar charged LED reading lights. I have one of these in my home. They are very efficient. And these lights improve health and promote education by providing safe and reliable lighting around the world. Unite to Light has distributed over 50,000 lights in 64 countries to date.

And these innovations are making a difference, and while we certainly need these innovators and entrepreneurs, we also need to ensure that we have a legislative landscape that supports and encourages the continued development of this and other similar technologies.

So Ms. Amann, based on the testimony you provided, it seems the current rule from the DOE has the potential to significantly impact the continued growth and availability of LED technology. Can you elaborate on how the availability of LED technology would be impacted by the existing rule in the absence of proposed legislation?

Ms. AMANN. In the absence of the legislation there will be a lot of uncertainty for manufacturers, and as I mentioned before, the one remedy that they have is to go through the DOE and use the waiver process or a hardship process. So there is a way to get around it, but it would be quite complicated, complex and time consuming and very inefficient use of company resources and time as well as DOE resources and time in the appliance standards program.

So I think that there would be, there is a way to get around it, but it is not, it doesn't make sense. And this legislative solution

really helps us ensure that there is—everybody can be focused on getting the efficient lighting out there, but also sets the authority for DOE to set standards in the future——

Ms. CAPPS. OK.

Ms. AMANN [continuing]. As efficient technologies develop.

Ms. CAPPS. I wanted to ask Dr. Hakkarainen, would the legislation that we are discussing today help to ensure that research and implementation of technologies to improve LED lighting will continue and, if so, how?

Dr. HAKKARAINEN. It certainly will help ensure that and to the how we will be able to dedicate our technical resources to that development rather than dealing with the regulatory uncertainty. We all have limited resources and it is the same resources that would be required for both.

Ms. CAPPS. I appreciate that. Thank you very much. I yield back.

Mr. WHITFIELD. At this time I recognize the gentleman from Ohio, Mr. Latta, for 5 minutes.

Mr. LATTA. Well, thank you very much, Mr. Chairman, and thanks to our panel for being with us today, really appreciate it. Sorry we are kind of in and out. We have another committee hearing running with the same thing downstairs.

But if I could, the lighting industry represents about 2,500 jobs in my home State of Ohio, and having talked with several of these manufacturers I have serious concerns with the external power supply energy conservation standard including LED and OLED technologies. And Dr. Hakkarainen, could you give us some examples in real-world applications of these products?

Dr. HAKKARAINEN. So in terms of real-world applications, I think the sort of examples I would like to give are commercial building projects where LED lighting is used today. So, for example, in your State in Ohio, Procter & Gamble headquarters and Eaton headquarters both use LED lighting today. In California there are lots of headquarters type projects such as Apple and salesforce.com and companies like that that have moved to LED lighting. Wells Fargo in North Carolina is another example. So they tend to be commercial buildings and industrial buildings.

A little bit of these types of LED driver products also make their way to residential buildings, but in residences we tend to have screw-in lamps more than the higher-cost commercial grade products. Does that help?

Mr. LATTA. Yes, thank you. And if I may, I continue with another question to you. Could you in regular terms explain to us again how these drivers are being impacted by the EPS rule?

Dr. HAKKARAINEN. They are being impacted today because the statutory definition of an external power supply is pretty broad and DOE's general counsel has interpreted the statutory definition to bring in quite a large range of products. So the debate is indeed about which ones of these LED and OLED drivers are brought into the definition and there is not sufficient clarity for manufacturers today and that is why we are here asking you to provide that clarity.

Mr. LATTA. Well, maybe if I could for both of you, Ms. Amann—am I pronouncing your name correctly?

Ms. AMANN. Amann.

Mr. LATTA. Amann. Thank you. If you could both in summarizing your testimony for us here, but if there is one major thing you would like us to take away from here today what would that be from today's hearing?

Ms. AMANN. Beyond the specifics of this issue I think it highlights one of the reasons that we are here today and we need legislation is because DOE doesn't have the authority to change the definition of a product if that definition is set in the statute.

So, I mean, one thing I think we can think about is where there are opportunities to allow DOE a little bit more leeway to adapt product definitions as the market changes and as new technologies are introduced as innovation continues to move forward.

Mr. LATTA. Thank you. Dr. Hakkarainen, would you like to comment?

Dr. HAKKARAINEN. I don't have really anything further to add. I think Jennifer said it very well.

Mr. LATTA. OK. Thank you very much. And Mr. Chairman, I yield back the balance of my time.

Mr. WHITFIELD. The gentleman yields back. At this time I recognize the gentleman from Texas, Mr. Green, for 5 minutes.

Mr. GREEN. Thank you, Mr. Chairman. Ms. Amann, I am glad to see efficiency advocates in industry working side by side. Does the DOE currently support SSL technology?

Ms. AMANN. Oh, absolutely. Absolutely. They are spending a lot of money under as mandated by Congress to do a lot of development in solid state lighting and have really made, really worked closely with industry to improve the market conditions and advance research and development on new technologies.

Mr. GREEN. Are the SSL technologies as energy-efficient as possible or is there currently room for more improvement?

Ms. AMANN. I think there is room for more improvement. The technology has been surprising everybody in terms of how fast they are meeting and exceeding their goals for efficiency improvements, and at this point it is exceeding almost all other light sources in terms of its efficiency.

Mr. GREEN. Dr. Hakkarainen, do you have a sense as to why SSL was not included?

Dr. HAKKARAINEN. Why SSL was not——

Mr. GREEN. Was included in the—DOE indicates here in here in their original NOPR they did not intend to include SSL products.

Dr. HAKKARAINEN. So I am not sure that I can answer that question, really. My sense is that DOE did not analyze any solid state lighting products in the development of the external power supply standard. But then, because of the broad statutory definition of an external power supply, they after the fact concluded that they may very well be in the scope.

Mr. GREEN. OK. In your testimony you make references that the rulemaking could threaten future investments. Would you explain further what costs would be associated with SSL inclusion?

Dr. HAKKARAINEN. If solid state lighting drivers are included in the external power supply standard, then the sort of costs, if it is even possible for drivers to meet the external power supply standard—that is still a question in my mind—but if we found a way over time to get to that point, then the driver devices would be sig-

nificantly more expensive for consumers and they would take a long time for our technical staff to develop.

Mr. GREEN. Is it technically feasible to meet the requirements of the DOE standard?

Dr. HAKKARAINEN. In my opinion at the moment, no.

Mr. GREEN. Thank you, Mr. Chairman. I yield back.

Mr. WHITFIELD. The gentleman yields back. At this time I would call on the gentleman from Texas, Mr. Flores, for 5 minutes.

Mr. FLORES. Mr. Chairman, thank you. I have no questions.

Mr. WHITFIELD. Mr. Harper, do you have any questions?

Mr. HARPER. Thank you, Mr. Chairman. No questions for me either.

Mr. WHITFIELD. Well, that is the end of the questions of our subcommittee. And Ms. DeGette who is a co-sponsor of the bill is a member of the Energy and Commerce Committee. She is not a member of this subcommittee and I didn't want you all to think we were discriminating against her, so at this time I would like to recognize Ms. DeGette for 5 minutes.

Ms. DEGETTE. Mr. Chairman, I never think you are discriminating against me, and I really appreciate you letting me sit in on this hearing. This is one of these issues where in retrospect it seems so simple that it should have been right in the first place, and it wasn't right in the first place. And now, of course, it could both hurt what—Ms. Amann, when I heard you talking about what the manufacturers would have to do to try to get a waiver I was just imagining Cooper Lighting which is one of my, your members and one of my companies in Denver, trying to petition the DOE to get a waiver from this standard. And it is exactly why people get irritated with Congress. So I am really happy that Congresswoman Ellmers and I have been able to come together to solve this problem.

I just want to ask a couple of sort of broader questions. Ms. Amann, I wanted to ask you, in your testimony you noted that before the EPS standard was developed many external power supply devices still used decades-old technology. I am wondering if you could talk for a minute how the EPS standard has encouraged 21st-century innovation.

Ms. AMANN. Sure. So in the technology that had been used for power supplies I think we can all remember the really huge, bulky power supplies, and you could never even get two in your plug. They were hot. That is a very inefficient technology that had been used throughout most of the twentieth century.

So in the '90s when new technology was developed in response to low cost for chips, the emergence of portable electronics, for the first time people wanted to carry their electronics and their power supplies. We got these new innovations that made the supplies smaller and much more efficient—much, much more efficient.

But into the 2000s those products, there were still a lot of cheap consumer products that were using the bulky, the inexpensive old school technology, and so that is why the manufacturers of those power supplies, many of them in California and other States, came together to agree on power supply standards so that we could get this new technology out there into all the different products that use power supplies.

Ms. DEGETTE. And Mr. Hakkarainen, do you have anything to add to that? Did manufacturers like you work with the efficiency advocates in DOE to pioneer the new technologies?

Dr. HAKKARAINEN. Yes, we typically do work with, actively work with the energy efficiency community and certainly collaborate with DOE in their rulemaking processes. Relative to the external power supplies themselves, I am not sure I can answer that question because we don't actually manufacture those devices.

Ms. DEGETTE. Right, you do those. Yes.

Dr. HAKKARAINEN. But we manufacture LED drivers.

Ms. DEGETTE. Yes. And it seems to me that the EPS standard has been effective in sparking innovation, but then if we shoehorn the LEDs into that the trend could be reversed and ironically instead of supporting energy efficiency, the EPS standard could actually inhibit that. Is that correct?

Ms. AMANN. Yes, I think so. And I would just point out, we had no idea how fast LEDs would develop and they weren't a product that was available at the time this was written. I mean, we didn't have iPhones then, smart phones. I mean, so much innovation has happened since the time that the standard was first adopted.

Ms. DEGETTE. Thanks. And did you want to add anything, Mr. Hakkarainen?

Thank you. Thank you very much, Mr. Chairman, and I hope we can pass this on on suspension. And then I actually thought your question was the most important one, is what do we do about the other body, because Chairman Upton and I are still trying to get our 21st Century Cures bill, which passed this committee unanimously, passed by the Senate. So if you figure out how to unlock this problem, you can get that bill through, too. Thank you. I yield back.

Mr. WHITFIELD. We feel quite confident that the Senate will recognize that we have perfected this legislation and they will adopt it.

But that does conclude today's hearing, and I want to thank our two witnesses for being with us and certainly want to reiterate our appreciation to Mrs. Ellmers and Ms. DeGette for sort of leading the charge on this. And with that, the record will remain open for 10 days, and that concludes today's hearing. Thank you very much.

[Whereupon, at 10:58 a.m., the subcommittee was adjourned.]

[Material submitted for inclusion in the record follows:]

PREPARED STATEMENT OF HON. FRED UPTON

We take our obligation to oversee regulations under this committee's jurisdiction very seriously and whenever there is a bipartisan opportunity to improve an existing rule, we take action. This is what we hope to do with the draft EPS Improvement Act of 2016, and I thank Reps. Ellmers and DeGette for their efforts on this bill.

We all know that consumer electronics are rapidly advancing—so fast that the technology sometimes renders obsolete the laws under which they are regulated. That is the case with the Energy Policy Act of 2005 and its provision requiring the Department of Energy (DOE) to set energy conservation standards for external power supplies, the most recent of which will take effect in February.

In the decade since the Energy Policy Act was signed into law, light emitting diodes (LEDs) have been developed and are growing in popularity. They use a power supply that is very different than anything contemplated in the 2005 law yet still fall within the statutory definition of an external power supply. The bottom line is

that the new DOE standard for external power supplies would cover LEDs, but there would be no way for LEDs to meet it.

The EPS Improvement Act of 2016 recognizes that LEDs need to be treated separately. It exempts them from the upcoming external power supply standard while creating a process by which DOE could set a new standard specific to LEDs.

This targeted bill would provide relief for LED manufacturers while ensuring that this popular product remains available to consumers back in Michigan and across the country.

.....

(Original Signature of Member)

114TH CONGRESS
1ST SESSION

H. R. _____

To amend the Energy Policy and Conservation Act to exclude power supply circuits, drivers, and devices designed to be connected to, and power, light-emitting diodes or organic light-emitting diodes providing illumination from energy conservation standards for external power supplies, and for other purposes.

IN THE HOUSE OF REPRESENTATIVES

Mrs. ELLMERS (for herself and Ms. DEGETTE) introduced the following bill; which was referred to the Committee on _____

A BILL

To amend the Energy Policy and Conservation Act to exclude power supply circuits, drivers, and devices designed to be connected to, and power, light-emitting diodes or organic light-emitting diodes providing illumination from energy conservation standards for external power supplies, and for other purposes.

1 *Be it enacted by the Senate and House of Representa-*
2 *tives of the United States of America in Congress assembled,*

SECTION 1. SHORT TITLE.

This Act may be cited as the "EPS Improvement Act of 2016".

SEC. 2. DEFINITION OF EXTERNAL POWER SUPPLY.

Section 321(36)(A) of the Energy Policy and Conservation Act (42 U.S.C. 6291(36)(A)) is amended—

(1) by striking the subparagraph designation and all that follows through "The term" and inserting the following:

"(A) EXTERNAL POWER SUPPLY.—

"(i) IN GENERAL.—The term"; and

(2) by adding at the end the following:

"(ii) EXCLUSION.—The term 'external power supply' does not include a power supply circuit, driver, or device that is designed exclusively to be connected to, and power—

"(I) light-emitting diodes providing illumination; or

"(II) organic light-emitting diodes providing illumination.".

SEC. 3. STANDARDS FOR POWER SUPPLY CIRCUITS CONNECTED TO LEDS OR OLEDS.

(a) IN GENERAL.—Section 325(u) of the Energy Policy and Conservation Act (42 U.S.C. 6295(u)) is amended by adding at the end the following:

1 "(6) POWER SUPPLY CIRCUITS CONNECTED TO
2 LEDS OR OLEDS.—Notwithstanding the exclusion de-
3 scribed in section 321(36)(A)(ii), the Secretary may
4 prescribe, in accordance with subsections (o) and (p)
5 and section 322(b), an energy conservation standard
6 for a power supply circuit, driver, or device that is
7 designed primarily to be connected to, and power,
8 light-emitting diodes or organic light-emitting diodes
9 providing illumination.".
10 (b) ENERGY CONSERVATION STANDARDS.—Section
11 346 of the Energy Policy and Conservation Act (42 U.S.C.
12 6317) is amended by adding at the end the following:
13 "(g) ENERGY CONSERVATION STANDARD FOR
14 POWER SUPPLY CIRCUITS CONNECTED TO LEDS OR
15 OLEDS.—Not earlier than 1 year after applicable testing
16 requirements are prescribed under section 343, the Sec-
17 retary may prescribe an energy conservation standard for
18 a power supply circuit, driver, or device that is designed
19 primarily to be connected to, and power, light-emitting di-
20 odes or organic light-emitting diodes providing illumina-
21 tion.".

January 19, 2015

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

Ranking Member Frank Pallone
Committee on Energy and Commerce
2125 Rayburn House Office Building
Washington, DC 20515

Dear Chairman Upton and Ranking Member Pallone,

Big Ass Solutions is a manufacturer of high-efficiency building components headquartered in Lexington, Kentucky. The company is a true American success story, starting in 1999 with just six employees. Today, Big Ass Solutions employs 835 people, generates more than $200 million in annual revenue, and has opened four international offices with more growth to come. Big Ass Solutions assembles products in Lexington, creating well-paying domestic manufacturing jobs. Additionally, its financial success extends beyond its own walls, as it sources many parts from domestic suppliers.

On January 12, 2016 the Energy and Power Subcommittee held a hearing to consider draft legislation that would modify a DOE final rulemaking for energy conservation standards on external power supplies (EPS). The purpose of this legislation is to avoid the unintended consequence of discouraging energy conservation in the lighting industry, because EPS products for high-performing light emitting diodes (LEDs) and organic LEDs would be covered under the rule.

Discussions in January 2016 with Department of Energy officials indicated that the ceiling fan industry would be similarly affected to the lighting industry. Big Ass Solutions has recently learned that some ceiling fans utilizing DC motors could also be covered under the final rulemaking, because there is a risk that the Department of Energy would view these power supplies as a covered product. DC ceiling fans are the top-performing technologies in their class in terms of energy consumption. This superior performance is enabled specifically by the application of a switching power supply. This technology is superior to previous products, regardless of whether the switching power supply is located internal or external to the end use product. If the Department of Energy's ruling includes power supplies for ceiling fans, some fans could no longer be sold in the United States because a critical component could no longer be manufactured.

Therefore, ironically, the DOE energy conservation standard would cause the most energy efficient fans to be taken off the market in the United States. For Big Ass Solutions, this market represents tens of millions in annual sales and several hundred jobs.

We request a modification of the draft EPS Improvement Act of 2016 to add ceiling fans powered by DC motors to the list of exceptions.

Suggested corrective Language

The Preamble is amended as follows:

> To amend the Energy Policy and Conservation Act to exclude power supply circuits, drivers, and devices designed to be connected to, and power, light-emitting diodes, organic light-emitting diodes providing illumination *or ceiling fans using direct current motors* from energy conservation standards for external power supplies, and for other purposes

Section 2 is amended follows:

> (ii) EXCLUSION.—The term 'external 14 power supply' does not include a power supply circuit, driver, or device that is de- 16 signed exclusively to be connected to, and power—
> (I) light-emitting diodes providing illumination; *or*
> (II) organic light-emitting diodes providing illumination; *or*
> *(III) ceiling fans using direct current motors.*

Section 3 is amended as follows:

> Sec. 3. Standards for Power Supply Circuits Connected to LEDs, OLEDs, *or DC ceiling fans.*
>
> POWER SUPPLY CIRCUITS CONNECTED TO 2 LEDS OR OLEDS.—Notwithstanding the exclusion described in section 321(36)(A)(ii), the Secretary may prescribe, in accordance with subsections (o) and (p) and section 322(b), an energy conservation standard for a power supply circuit, driver, or device that is designed primarily to be connected to, and power, light-emitting diodes or organic light-emitting diodes providing illumination *or ceiling fans powered by direct current motors.*
>
> ...
>
> ENERGY CONSERVATION STANDARD FOR POWER SUPPLY CIRCUITS CONNECTED TO LEDS OR OLEDS.—Not earlier than 1 year after applicable testing requirements are prescribed under section 343, the Secretary may prescribe an energy conservation standard for a power supply circuit, driver, or device that is designed primarily to be connected to, and power, light-emitting diodes or organic light-emitting diodes providing illumination *or ceiling fans powered by direct current motors.*

For additional background:

- Ceiling fans are already subject to a separate DOE rulemaking for energy conservation standards. A Notice of Proposed Rulemaking (NOPR) for these standards was issued in December 2015. These standards will ensure that the energy consumption of ceiling fans as a final product is regulated.

- Much like an SSL LED driver, many DC motor power supplies consists of a first and second stage. The first stage consists of a voltage level conversion and the second stage consists of the DC motor power supplies which is analogous to the constant current LED drive stage in an SSL. Due to the diverse design of DC motors, the power supply stage is normally separate from the first stage and is custom designed to provide the best system efficiency for a given motor.

We appreciate the opportunity to comment on this draft legislation, and we welcome any questions you may have.

Sincerely,

[redacted]

Patrick Keal
Government Affairs Director
Big Ass Solutions

cc:

Subcommittee Chairman Ed Whitfield
Energy and Power Subcommittee
Committee on Energy and Commerce
2125 Rayburn House Office Building
Washington DC, 20515

Subcommittee Ranking Member Bobby Rush
Energy and Power Subcommittee
Committee on Energy and Commerce
2125 Rayburn House Office Building
Washington DC, 20515

FRED UPTON, MICHIGAN
CHAIRMAN

FRANK PALLONE, JR., NEW JERSEY
RANKING MEMBER

ONE HUNDRED FOURTEENTH CONGRESS

Congress of the United States

House of Representatives

COMMITTEE ON ENERGY AND COMMERCE
2125 RAYBURN HOUSE OFFICE BUILDING
WASHINGTON, DC 20515–6115
Majority (202) 225–2927
Minority (202) 225–3641

February 3, 2015

Ms. Jennifer Amann
Buildings Program Director
ACEEE
529 14th Street, N.W., Suite 600
Washington, DC 20045

Dear Ms. Amann:

Thank you for appearing before the Subcommittee on Energy and Power on Tuesday, January 12, 2016, to testify at the hearing entitled "H.R. ____, the EPS Improvement Act of 2016."

Pursuant to the Rules of the Committee on Energy and Commerce, the hearing record remains open for ten business days to permit Members to submit additional questions for the record, which are attached. The format of your responses to these questions should be as follows: (1) the name of the Member whose question you are addressing, (2) the complete text of the question you are addressing in bold, and (3) your answer to that question in plain text.

To facilitate the printing of the hearing record, please respond to these questions with a transmittal letter by the close of business on February 17, 2016. Your responses should be mailed to Will Batson, Legislative Clerk, Committee on Energy and Commerce, 2125 Rayburn House Office Building, Washington, DC 20515 and e-mailed in Word format to Will.Batson@mail.house.gov.

Thank you again for your time and effort preparing and delivering testimony before the Subcommittee.

Sincerely,

Ed Whitfield

Ed Whitfield
Chairman
Subcommittee on Energy and Power

cc: The Honorable Bobby Rush, Ranking Member, Subcommittee on Energy and Power

Attachment

ACEEE
American Council for an Energy-Efficient Economy
529 14th Street, N. W., Suite 600 ⊙ Washington, D.C. 20045 ⊙ 202.5074000 ⊙ 202.429.2248 ⊙ www.aceee.org

Responses to Additional Questions for the Record

Re: 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

Submitted February 17, 2016

The Honorable Frank Pallone

1. **In general, the cost and availability of solid state lighting has changed dramatically over the past decade since we enacted EPACT 2005 and directed DOE to begin regulating EPSs.**
   A. **What has happened to the price, availability and market penetration of solid state lighting since 2005?**

   In 2005, the market for solid state lighting was limited to a few niche applications for specialty lamps and fixtures (e.g., traffic signals, under-counter lighting, etc). Since that time, manufacturers have introduced solid state lighting products for a wide range of lighting applications including the most common general service lighting applications traditionally served by incandescent and fluorescent lighting technologies. The earliest solid state lighting products carried a very high cost premium relative to incumbent lighting technologies (e.g., the earliest screw-based LED lamps were priced around $50.00 compared with prices of less than $0.50 and $5.00, respectively, for the incandescent and compact fluorescent products they were meant to replace). Today, general service LED lamps are widely available for $5.00 and even less at virtually all hardware and grocery stores. In the commercial market, the availability of solid state lighting products for a wide range of applications has grown. While linear fluorescent lamps still dominate the office and other large commercial submarkets, solid state lighting products are beginning to make inroads.

   B. **What technological, efficiency and environmental advantages, if any, do solid state light sources have over incandescent bulbs and compact fluorescent bulbs?**

   Solid state light sources offer numerous advantages over incandescent bulbs and compact fluorescent lamps (CFLs) including superior energy efficiency, longer operating life, no risk of mercury exposure, and reduced solid waste disposal. These advantages translate into significant monetary savings for businesses and consumers through lower utility bills and reduced maintenance and disposal costs as well as significant reductions in pollution emissions.

   C. **What impact have these changes in solid state lighting cost, availability and market penetration had on energy efficiency, consumer savings and pollution reduction?**

   To date, the market for solid state lighting remains small but it is growing rapidly. DOE estimates that in 2013 LED lighting accounted for about 3% of the lighting market. As a result, the technology is just beginning to have a notable impact on energy consumption, consumer electricity bills, and pollution reduction at a national level. While the impact to date has been limited, growth forecasts for solid state lighting demonstrate the dramatic impact the technology will have over the next 10-15 years. DOE analysis predicts that solid state lighting market share will grow to 48% and reduce national lighting energy consumption by 15% in 2020. By 2030, it will dominate sales for all major lighting applications, driving a 40% reduction in lighting energy use yielding energy savings of 3.0 quads in the year 2030 alone. This savings is equivalent to roughly 3% of total U.S. annual energy consumption or the energy consumed by 24 million U.S. homes today.[1]

[1] http://energy.gov/sites/prod/files/2015/05/f22/energysavingsforecast14.pdf

2. **In reference to the legislation, your written testimony states that "ACEEE is satisfied...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...in the future, if warranted."**
   A. **Can you elaborate on ACEEE's concern that the current rulemaking could pose an obstacle to the continued growth of solid state lighting? Are you concerned about cost increases, manufacturing impediments, or something else?**

      ACEEE's primary concern is potential disruption in the market stemming from manufacturer uncertainty over the regulations governing a subset of solid state lighting products. As noted in my written testimony, many SSL products use power supplies, also known as SSL drivers, to power LED lighting. The broad definition of external power supplies incorporated in EPACT 2005 captures SSL drivers which were largely developed after the statute was enacted and were not the intended target of the EPS provision. SSL products operate differently than other products using EPS, cannot be tested under the required EPS test method, and cannot be shown to comply with the EPS standard. This leaves manufacturers at risk since their products are technically covered by the regulation, but they cannot perform the required test procedure or show compliance with the mandatory standard. While DOE has mechanisms in place to grant waivers in this type of situation, the waiver process would be unduly burdensome for such a large and diverse set of products. This remedy would impose significant costs on industry and DOE and lead to delays in getting innovative new SSL products to market. Such costs and delays are of particular concern given that SSL drivers were never the intended target of the EPS standard.

3. **Your testimony also states that 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." Our goal here is only to surgically remove solid state lighting drivers from the current rulemaking for EPSs, so ensuring the Secretary's ability to set efficiency standards for solid state lighting drivers is very important to me and many Committee members, too. However, I believe the Secretary would still be able to set such efficiency standards in the future pursuant to other, existing authorities in EPCA regardless of the inclusion of the provision you reference in your testimony.**
   A. **What advantage does the language in the current legislative proposal provide over using existing authorities to promulgate efficiency standards for solid state lighting in the future?**

      The language in the current legislative proposal gives DOE explicit authority to promulgate standards for SSL drivers in the future, if warranted. At present, SSL drivers are not a covered product nor are other SSL products (e.g., SSL luminaires or fixtures) that incorporate SSL drivers. It is unclear whether SSL drivers would meet the criteria for a separate coverage determination under DOE's existing authority under EPCA. The language would ensure that DOE has the authority to set standards for these products without a coverage determination. Congress previously gave this authority to DOE for televisions.

FRED UPTON, MICHIGAN
CHAIRMAN

FRANK PALLONE, JR., NEW JERSEY
RANKING MEMBER

ONE HUNDRED FOURTEENTH CONGRESS

Congress of the United States

House of Representatives

COMMITTEE ON ENERGY AND COMMERCE
2125 RAYBURN HOUSE OFFICE BUILDING
WASHINGTON, DC 20515–6115
Majority (202) 225-2927
Minority (202) 225-3641

February 3, 2015

Dr. Pekka Hakkarainen
Vice President
Lutron Electronics
7200 Suter Road
Coopersburg, PA 18036

Dear Dr. Hakkarainen:

Thank you for appearing before the Subcommittee on Energy and Power on Tuesday, January 12, 2016, to testify at the hearing entitled "H.R. ____, the EPS Improvement Act of 2016."

Pursuant to the Rules of the Committee on Energy and Commerce, the hearing record remains open for ten business days to permit Members to submit additional questions for the record, which are attached. The format of your responses to these questions should be as follows: (1) the name of the Member whose question you are addressing, (2) the complete text of the question you are addressing in bold, and (3) your answer to that question in plain text.

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Thank you again for your time and effort preparing and delivering testimony before the Subcommittee.

Sincerely,

Ed Whitfield

Ed Whitfield
Chairman
Subcommittee on Energy and Power

cc: The Honorable Bobby Rush, Ranking Member, Subcommittee on Energy and Power

Attachment

LUTRON® ELECTRONICS CO., INC.

DR. S. PEKKA HAKKARAINEN, MA, PhD
Vice President

February 17, 2016

The Honorable Ed Whitfield
Chairman
Subcommittee on Energy and Power
Committee on Energy and Commerce
2125 Rayburn House Office Building
Washington, DC 20515-6115

Dear Chairman Whitfield:

Please see the attached document regarding additional questions from members of the Subcommittee to my testimony during the hearing entitled "H.R. ____, the EPS Improvement Act of 2016".

Thank you again for allowing me to testify on behalf of my company and the industry. Please feel free to contact me with any further questions.

Sincerely,

[redacted]

Pekka Hakkarainen
Vice President, Lutron Electronics

[redacted] [redacted]

Additional Questions for the Record

The Honorable Frank Pallone

1. **Your written testimony states that "[t]his 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."**

   A. **Can you elaborate on NEMA's concern regarding the complexities of solid state lighting drivers so that we can better understand what that means?**

   Response: Typical external power supplies like the ones used for laptop computers or cell phones simply supply power at a steady level to charge the device. SSL drivers often contain – because of market requirements – additional circuitry for the support of a range in wattage of LED loads, network communication, status monitoring, and dimming of the lights. All of these features come at a cost of power consumption, and none of these features are contained in typical EPS products. The EPS energy standard and the test procedures prescribed by DOE do not take into account these additional features and power consumption requirements. As such, certain SSL drivers tested against the DOE test procedure would not comply with the energy conservation requirements. At the technical level, EPS products have a single power conversion stage from household AC current to (typically) a relatively low voltage (5-12V) DC current. The efficiency of this power conversion can relatively easy meet DOE's standards. LED drivers use a two stage power conversion, first from household AC current to a higher voltage DC stage, and then from that to another (often modulated) DC stage to operate the LEDs. While the efficiency of the first stage (the actual power supply) meets DOE's standard, the overall efficiency of the driver is the product of the efficiencies of the two stages, and that overall efficiency falls short of the requirement. This type of driver design is required because of the additional features mentioned above.

   As mentioned in our testimony, when the DOE final rule was issued, DOE stated that it had not evaluated SSL drivers during the process of establishing the EPS efficiency requirements. One significant example of this is the statutory requirement to meet a "No-Load Test" condition, i.e. minimum power consumption by the EPS when disconnected from the external device. SSL drivers are typically hardwired into the light fixture, so the no-load condition does not exist. The No-Load Test condition is more accurately applied to an external power supply that is often left plugged in even when the device is somewhere else (like a cell phone). However, the DOE rule prescribes a No-Load efficiency requirement for all EPS products, including SSL drivers.

B. What is the practical impact of such a rulemaking at this time: are you concerned about cost increases, manufacturing impediments, or something else?

Response: Most SSL drivers would not comply with the DOE energy conservation standards and would not be able to be purchased or installed. This would be very disruptive to the adoption of highly energy-efficient lighting by consumers and businesses which are rapidly embracing SSL technologies. A result would be higher energy costs as compared to energy costs using SSL technologies. Investment in SSL technology by manufacturers is significant and on-going. Having to divert investment dollars to re-design SSL drivers, with the result of reduced features, would slow market adoption of these highly efficient technologies.

2. One of the provisions in the legislation explicitly grants DOE authority to set future standards on these products is critical to ACEEE's support for the bill." Our goal here is to enact very narrow legislation. In essence, we are looking to surgically remove solid state lightings drivers from the current rulemaking for EPSs. However, we want to preserve the Secretary's ability to set efficiency standards for solid state lighting in the future.

A. Can you give us NEMA's views on the provision in the bill explicitly granting DOE authority to set future standards on these products?

Response: Section 3 of the legislative proposal would provide the Department of Energy flexibility to prescribe energy conservation standards for solid state lighting drivers either under the consumer product category or under the commercial product category, subject to existing requirements in the Energy Policy and Conservation Act. This provision restates that DOE has the statutory ability to set standards for SSL drivers in the future, subject to other EPCA requirements.

B. In NEMA's view, what advantage does the language in the current legislative proposal provide over using existing authorities to promulgate efficiency standards for solid state lighting in the future?

Response: In order to set energy conservation standards on a product, there must first be a documented test procedure on how to measure and test the product. The language in the proposed legislation makes it clear that the test procedure applicable to SSL drivers must be issued by the DOE no later than one year from when the DOE would issue energy conservation standards on the products. This one-year timeframe is important to ensure that the efficiency levels that are proposed and eventually prescribed by the DOE are levels that can be properly tested and that industry has sufficient time to make necessary adjustments to products in accordance with the test procedure.

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