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H.R.__, THE EPS IMPROVEMENT ACT OF 2016

TUESDAY, JANUARY 12, 2016

House of Representatives,

Subcommittee on Energy and Power,

Committee on Energy and Commerce

Washington, D.C.

The subcommittee met, pursuant to call, at 10:00 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, Energy and Power and Environment and the Economy; 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; Jen Berenholz, Minority Chief Clerk; Christine Brennan, Minority Press Secretary; Jeff Carroll, Minority Staff Director; Rick Kessler, Minority Senior Advisor and Staff Director, Energy and Environment; and Alexander Ratner, Minority Policy Analyst.

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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, 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.

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 common sense 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 to less energy efficiency 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 five minutes.

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 five minutes.

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.

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 Improvement 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 five-minute opening statement.

STATEMENTS OF JENNIFER AMANN, BUILDINGS PROGRAMS DIRECTOR, AMERICAN COUNCIL FOR AN ENERGY-EFFICIENT ECONOMY; AND PEKKA HAKKARAINEN, VICE PRESIDENT, LUTRON ELECTRONICS

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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Mr. Whitfield. Well, thank you very much. And Dr. Hakkarainen, you are recognized for five minutes.

STATEMENT OF PEKKA HAKKARAINEN

Mr. Hakkarainen. Good morning, Chairman Whitfield and Ranking Member 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 designed 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 Mr. Hakkarainen follows:]

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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.

Mr. 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. Okay.

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. Okay, 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?

Mr. 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?

Mr. Hakkarainen. Quite probably would, yes.

Mr. Whitfield. Okay. 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. Okay. I yield back the balance of my time and just kind of recognize Mr. McNerney for five 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?

Mr. 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. Okay.

Mr. Hakkarainen. -- 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 --

Mr. 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. Okay. 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. -- 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.

Mr. 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.

Mr. 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?

Mr. 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?

Mr. Hakkarainen. Correct.

Mr. McNerney. Okay. 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 five 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?

Mr. 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 --

Mr. 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 driver 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?

Mr. 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.

Mr. 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?

Mr. 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 five 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. Okay.

Ms. Amann. -- 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?

Mr. 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 five 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?

Mr. 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?

Mr. 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?

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

Mr. Latta. Okay. 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 five 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?

Mr. 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.

Mr. 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. Okay. 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?

Mr. 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 significantly 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?

Mr. 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 five 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 five 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 twenty-first 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?

Mr. 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.

Mr. 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 thought, 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 this charge on this. And with that the record will remain

894 open for ten days and that concludes today's hearing. Thank you

895 very much.

896 [The bill The EPS Improvement Act of 2016 follows:]

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