

Text-Alternative Version: High Efficiency Parking Lot Lighting for Federal Agencies Webinar

Linda Sandahl: Welcome, ladies and gentlemen. I'm Linda Sandahl with the Pacific Northwest National Laboratory, and I'd like to welcome you to today's webcast, *High Efficiency Parking Lot Lighting for Federal Agencies: The Time is Now to Join LEEP and Get the Resources you Need*, brought to you by the US Department of Energy's Federal Energy Management Program. I'm happy to introduce our speakers today, Jeff McCullough of the Pacific Northwest National Laboratory and Marci Sanders, of D&R International.

Jeff McCullough is a senior research engineer with the Pacific Northwest National Laboratory and has been with the Lab for about 14 years. His main area of focus is in commercializing energy efficient technologies, particularly lighting and HVAC systems. Jeff led development of the first ENERGY STAR criteria for Solid State Lighting and operates the automated long term test facility which tests submissions for DOE's L Prize competition. Presently Jeff's working on DOE's Federal Energy Management Program to move advanced lighting technologies into the de facto position for federal facilities.

And, after Jeff, will be Marci Sanders. Marci is D&R's International Director of Energy Efficiency Programs where she over sees program planning and development. She also serves as the program manager supporting the US Department of Energy Solid State Lighting Program where she manages the LED Lighting Facts program which you'll be learning more about today. Marci has more than 15 years of market development program and project management expertise in energy efficiency and she hold a bachelor's degree in political science from Willamette University.

OK, Jeff, please begin.

Jeff McCullough: Thank you, Linda and let me extend my welcome to everybody on today's webinar. Appreciate you taking time out of your busy schedule to learn about the LEEP program and some of the FEMP activities as it relates to outdoor lighting. So, let's go ahead and get started. These are the topics we are going to cover today and in a nutshell what we'd like to share with you is some of FEMP's activities as it relates to exterior lighting. What we want to inform you about the LEEP Campaign, not to be misconstrued with LEED, this is the LEEP Campaign, we'll talk to you about what's involved and how you can become a participant or supporter and then towards the end of the presentation, I'll hand over control to Marci and she'll be walking us through a demonstration of the Lighting Facts program which will help you as far as the tools necessary to find products that meet the efficiency requirements required by federal purchasers.

The first couple of slides, I'm going to build the case that efficient and for the most part, LED, but I'm not only saying LED – there's certainly efficient lighting other than LED sources out there but I'm going to make the case that the potential is there and the time is now for you to act. So there's my sales pitch, then we'll go through some of the federal requirements for purchasers of the lighting equipment and talk about FEMP designation and from there we'll talk about the LEEP campaign and the tour that I spoke about.

With that, let's go ahead and jump in. This slide actually is sharing with you the breakdown of federal energy, not only the lighting use, but also a breakdown of lamp technology. I hope you can see the font, some of the font is fairly small, so I'll cover them fairly quickly. Left hand pie chart, you can see clearly

that between area lighting, roadway lighting, parking lot and parking structure, that's almost about 90 percent is encompassed in those four categories. Energy consumption is five terawatt hours that is a large, large number so keeping in mind that's a very significant portion of the energy portfolio on the federal side. As it relates to technology, the right hand pie chart shows you breakdown by lamps. It's not counting the number of lamps but the technology used. And as you can see here -- and again we're talking outdoor, high pressure sodium is about 33 percent of the market, metal halide about 19, fluorescent about 20 and not the smallest slice of the pie but certainly next to the smallest, is LED currently at 3 percent. As a side note, if you are using any type of mercury vapor, please change those yesterday. That technology is long since gone and there are opportunities to go to more efficient technologies.

What I'd like to talk to you about is some fairly current case studies on the federal side where federal users have embraced energy efficient lighting and are trying out some of the newer technologies that are out there. This particular demonstration is the Department of Labor Building in Washington DC. It's a parking structure. You can see the luminaire they are using, rather unique looking, some would call it a pagoda fixture but it is actually a Philips Wide-Lite Visor LED product, used in a parking structure. They currently have integral occupancy sensing so when there is no occupancy or no motion it goes down to 10 percent power. So it goes to a dim state. What they found is that the initial minimum illuminance, that's the light striking the surface, increased by 21 percent and the average decreased by 53 percent. Before you scratch your head and say wait a minute, that doesn't make sense, keep in mind that when we talk about minimum, that's the minimum over the entire space, if the average decreased it means that the uniformity increased and that's one of the significant benefits of solid state lighting is that you can actually have lower light levels but yet be able to see better because of the improvement in uniformity.

Moving on, 55 percent wattage reduction in the high state, 95 percent when they went to that no-motion off state, if you will. So 95 percent reduction in low, about 80 percent energy consumption reduced, that includes the dimming, they did a one to one replacement and based on today's dollars, in fact this slide is probably a year, year and a half old, in today's lighting climate with the current changes we're seeing, particularly on the LED side, the cost of these luminaries is decreasing dramatically. So, even though, this shows an eight year simple pay back, for retrofit and five year for new, I would venture to guess that we're probably at least 25 percent less. I would expect at a six year, maybe a three year for new based on today's cost.

Here's another example, here's a naval facility in Fort Hueneme, California. In this case, light levels increased by 18 percent, they did a 74 percent reduction demand in kWh. Again, they saw an increase in distribution. These are fairly high color temperature. I think most folks know that the higher the number the bluer the light source so these were actually 6500 kelvin, a fairly blue source and they replaced 2000 K, which is rather orange -- high pressure sodium. One of the benefits with the LED is there instant on -- you don't have that restrike or time delay when there is a power outage or when you cycle the lamps. And they expect longer life, at least 50,000 for the LED compared with 24,000 hours for high pressure sodium.

Here's an interesting project that is actually on going as we speak. This is a border area down in Yuma, Arizona -- probably one of the more hostile environments as far as temperature as that you would expect. Currently the US Customs and Border Protection are looking at a project replacing 7.2 miles along the US Mexico border. The existing luminaries are 1,000 watt metal halide floods -- that's the top picture that you see to the right. I'll point out that there are three fixtures there. The center one, some

time ago, was deactivated for energy conservation purposes. So there are only two of them operating. Metal halide is about 4200 – 4400 kelvin and given the high wattage and the orientation of the lamp there were getting about 12,000 hour lamp life. Not very long -- pretty much an on-going maintenance kind of activity. They were able to replace those luminaries one for one with 315 watt LED products. They are 4000 kelvin, so a fairly warm color temperature for LED. Based on the designs and how they are driving these luminaires, even at the elevated temperature that you would expect in a Yuma, Arizona climate they are expecting 60,000 hours to L 90. For those who are not familiar with that kind of terminology, when we talk about LEDs, we don't really like about life per se, we talk about luminance maintenance to a certain point in time. And for this project, they are projecting 90 percent of initial light output at 60,000 hours. Energy savings for this project is 73 percent – and that's just energy. Imagine the maintenance savings and actually in this particular area, you can envision a four wheel drive bucket truck going out there and servicing these lamps fairly quickly. So I would probably argue their biggest cost reduction is in maintenance. But, nonetheless, energy savings was 73 percent just by itself. Significant improvements in uniformity, and for those of you who are on the call from DOE or the ARMY, there are some tactical enhancements by virtue of using LED that are pretty exciting. Also instant on -- so if a power outage ever took place; you wouldn't have to wait that three, five, ten minutes for that lamp to restrike.

This is an actual photograph taken in February – and let me just set the scene here, one of the things that was done – the existing 7.2 miles, there are 205 poles, with two fixtures essentially on each pole. The original poles are 60 feet tall and the last three are the mock up demonstration, and the poles were actually shortened to 40 feet. Because of the optics with the LEDs they didn't need that height and one of the key things that LED allows us to do is to put the light where we need it. And the whole idea is to illuminate this entire corridor which is about 130 – 135 feet wide. Let me go to the next slide and you can see what this looks like at night. This is approximately the same location – a little farther back. A couple of things I would point out, if you look at the three fixtures on the horizon those are the LEDs at 40 feet. Look at the color difference. So 4000 kelvin is still a fairly warm color but there's a lot more red in the content. You can actually see that with the light striking the primary fence and the light on the ground as well. The other thing you should take away from this slide, if you look at the metal halide products the two poles closest to you, you can see that there's kind of a stripe, if you will, that emanates from the base of the pole and that's due to the optics, and they actually have a top side shield. But with the LED, because of the micro optics, nano optics that they are using they essentially eliminates that. You don't have any striation, you don't have these hot or cold spots, meaning areas of higher intensity that you would compared to the metal halide system. Pretty exciting project, it will be an on-going effort for FEMP to track performance over time but we're very excited about this because if LEDs can perform in this environment then pretty much they can perform every else as well.

Let's shift gears now and talk about you. You, for the most part, are federal purchasers. You're hopefully in charge of making decisions on lighting for your facilities. One of the things that you probably already know, but I'll reinforce it, that as a federal entity you are required to buy energy efficient products – there are various legislative mandates that direct you to do so. You know that you have to buy ENERGY STAR, as whether it is ENERGY STAR, FEMP will usually step up and define minimum performance requirements. ENERGY STAR, as it relates to lighting covers lamps, replacement lamps, and for the most part residential light fixtures. They have a little bit of overlap but they presently don't cover outdoor commercial lighting. FEMP does set, or has set, performance requirements for outdoor applications and we'll start about those in a couple of minutes.

If you're curious as to what the FEMP requirements are, or what is covered for lighting – and I apologize for these long URL's – again, slides will be made available to you. But on the FEMP website you can actually go and select – in this case, I have selected lighting and I've taken a screen shot of the various categories of lighting both components and systems that FEMP will actually set performance requirements for.

The next slide will show you what the actual breakdown is. So basically I'm selecting the exterior tab, on the right hand side of the menu, and we'll show you what the requirements are because today's talk is, of course, on exterior lighting.

So there are six efficiency requirements – six categories for exterior lighting, sorry. They are broken out by their efficacy rating and one thing I would point out for you is that for existing technologies we use the term LER – luminaire efficacy rating. I probably should put the equation up there, but essentially you're taking a rated value for the lamps, times the ballast factor, times the number of lamps and multiplying that by the fixture efficiency and then you're dividing that by input power into the luminaire.

For LED products, they are measured in a different way. They are measured on what we call an absolute basis. So, we don't do this kind of scaling effect that we do with incumbent technologies but regardless of whether you are using incumbent metal halide or HID, for LED, we're concerned about the light that leaves the luminaire divided by the input power. So you're free to use whatever technology but they do need to meet these numbers that you see in on the table in front of you.

These six categories encompass 97 percent of all federal exterior lighting. There is no overlap with ENERGY STAR so you don't have to worry about any issues there. We'll be hearing from Marci a little bit later is how we've set up a portal within DOE Lighting Facts Program that basically applies this rule set, these efficacy numbers that you see, to the products that are currently captured in DOE Lighting Facts program. It's a tool that you can use to help identify products that meet these requirements.

Let's talk about the LEEP Campaign; again it's not LEED – meaning it's not Leadership in Energy and Environmental Design. It's actually Lighting Energy Efficiency in Parking and I'll broaden that term to say that it's not just parking -- though that was the original thinking. But if you've got aerial lighting, and that type of thing, that's certainly is something that can be considered as well. We have had an on-going Campaign. It has been an effort to recognize, to provide guidance for folks looking for high efficiency lighting in parking facilities. Again, originally it was parking lot and parking structure, but I think you'll see that broaden as the effort goes forward. We're focusing on barriers to adoption. Of course, were trying to get folks to use advanced lighting, energy efficient lighting. And let me be clear, its not specifically LED, there are a couple of technologies that can meet the requirements. And to save energy were always interested in those. But certainly with LEDs out there being utilized quite a bit, it certainly needs to be considered when making decisions.

So, there are a bevy of resources that are available to you via this LEEP Campaign. And there's a website: leepcampaign.org -- you can see the URL up on the upper right hand side. There are tools and resources that have been tailored to the Campaign. There are some technical assistance opportunities so if you have a project and you (maybe are not a lighting guy or gal) and would like a little bit of guidance, were happy to provide that on a limited basis.

The organization of the LEEP Campaign – DOE is a partner, but actually it is organized by the Building Owners and Managers Association (BOMA) -- you may have heard that term before. And also the International Facility Management Association – IFMA and the Green Parking Council. So those are the three organizing sponsors. They are teaming with the DOE Better Buildings Alliance and the Federal Energy Management Program. To date there are over 100 participants or sites and over 100 supporters. And supporters can be fairly broad based, utilities, efficiency groups, manufacturers – you don't necessarily need to have a site to become a supporter. My call today is that if you are a federal entity and you'd like to get recognition for your efforts, the Campaign is on-going. It will be going forward through April of 2015. There's plenty of time. So if you've got area lighting, parking area, parking structure project on the horizon, please join the Campaign and get recognized for your efforts.

Phase 1 is what's currently what's under way. Actually, we are closing out Phase 1 and are essentially launching Phase 2 now. There will be an award announcement coming up on the 15th of this month. Sorry – April. The original target was one hundred million square feet of parking lot and parking structure and we're pleased to say that we exceeded that. We're well over 270 million square feet – check that we're over 160 million square feet. I moved ahead a bit too far. We received over 21 submissions from organizations and those efforts have yielded 45 million kilowatt hours per year savings. And that's about 500,000 parking spaces and about 600 parking facilities. On average, participants saved about 56 percent of their energy consumption and some sites were in the 80-85 percent range. Some did quite well. Of course if you are coming from older technology that was over lit, your savings are going to be greater than if you've got a fairly new facility with fairly efficient lighting as it is.

There are twelve different categories and I'll go over these in the next slide and the next round of awards will be given in June of 2015. So again, we're essentially launching Phase 2 and then it will close in June of 2015.

OK, there are twelve categories within which you can participate. They are basically broken down into retrofit, new construction and general. And within the retrofitted new construction, you've got absolute savings for parking lot and or structure. Greatest percent savings again absolute parking lot and structure and then under the general tab, best use of controls, the greatest number of sites, that you have multiple sites could be something you could consider submitting for, greatest percentage of portfolios. So, if you're doing your entire stock of facilities, of areas, potentially getting recognized for that activity. And then one grand prize winner which is the greatest overall kilowatt hours savings.

Let's go through, very quickly here, some the resources I highlighted them before, but I'll talk about them in detail and let's start at the case studies and move our ways clockwise. So there are a number of members and partners who have shared with us their lessons learned, their decision points, their energy savings and so we've captured these in case studies and again all of these are available out on www.leepcampaign.org. You can go see what these look like.

So there are case studies, there are specifications that have been developed underneath the Better Buildings Alliance for parking lot; parking structure and we also have wall packs. If you have interest in those, and you don't want to start from scratch you can use those boilerplate specifications as part of your solicitation package.

I mentioned earlier that we are offering limited technical assistance so that's something you can take us up on. If you're federal facility and you have requirements for doing M&V there's a guidance document

also available to help you through that process. We'll be talking about Lighting Facts in a little bit. There are a couple of excellent design vignettes that were developed underneath the FEMP umbrella. One specifically for parking structure and one for parking lot. These are about 10-12 pages long and they are excellent. I give kudos to my colleague, Michael Myer, for being largely in charge of developing these. If you're not a lighting person, so to speak, and you need some help in developing opportunities, and layout, and the thought process these are excellent tools in helping for you to use to become educated.

If I go down to the very bottom, at the six o'clock position, there's a list of utility incentives. So if you have areas within utility service territories and you're curious if there are any rebates or incentives available you can take advantage of that listing there by utility. There's an energy estimator to compare against code. For example, if you have an existing facility and are considering an upgrade you can actually go out and compare and contrast that new system to the prevailing energy code or whichever code you would select. And then the bottom left hand corner is kinda an introductory piece, I think that's a couple of pages informing folks on what involved in the LEEP Campaign.

Let's go ahead and move to the next slide. I am obviously not going to read all these to you but you should recognize some of these names. So if you're on the federal side, there have been some of your colleagues, if you will the DOD side of things that have taken advantage of the LEEP campaign and have participated. On the private side, there are names you would probably recognize. A lot of interest and a lot of interest going forward.

Let me share an additional tool that I think will be helpful to you especially if you are on the federal side. It's a retrofit financial analysis tool, and I guess one of things I should share with you, is the Department of Energy has a very robust Solid State Lighting Program and one of the programs underneath that is this Municipal Solid State Street Lighting Consortium. As part of that effort, they partnered with the Clinton Climate Initiative and in this case also the Federal Energy Management Program in developing a tool for end users to help you in your decision process in making some of those economic comparisons necessary for justifying and substantiating your choices.

So this is simply a screen shot of the opening tab if you will. It's a fairly large Excel spread sheet. It's fairly involved -- depending on your level of knowledge you can be as detailed as you wish or you can kind of roll it back a level. Let me go ahead and advance to the next slide -- kind of give you a sense of the structure of this tool. Using the flow chart at the bottom, you can start with the input page, which is the prior slide that I showed. From there you can make decisions about your existing situation, your proposed installation costs on-going costs over the life of the system, environmental impact, and of course the output would be a result summary. The maintenance page and the finance page are optional. Again, I said, there's a fair level of detail in this tool and depending on your needs and depending on how much information you have about the facility, you can choose to - or not to - include the maintenance and finance pages.

I encourage you to take a look at that tool, especially if you're required to do some economic analysis on your system. What it is, is Excel based, it allows you to evaluate cost and benefits. It's not a design tool, meaning you won't see any kinds of layouts or illuminance guide line it simply is -- you simply put the information of your existing system and then your proposed system. It's not a database of technology. So it doesn't help you choose between one technology or another. You need to know what you're doing up to that point. It provides a lot of analysis on the output side of things from an economic standpoint -- energy and costs savings. Maintenance savings which can be a pretty significant factor especially if we're talking about long operating hours. Outdoor applications and potentially other long lived LED

products that are out there. If you have to account for greenhouse gas reductions you can do that as well. And of course, all the economic terms: internal rate of return, simple pay back. Those types of things.

Current version is out there as of October 21, 2013. I encourage you to take a look at that.

Here's the link to that website where you can go and download. It's actually a zip file. When you unzip it you can make the choice as to what you like to see. There is a guidance document. Basically a how-to -- one thing that I would share with you is on this same website they have presentations and recording from webinars. So it's not like we are sending you out there and expecting you to hit the ground running. There's plenty of guidance and education and literally videos on how to use the tool.

With that, I'm going to hand things over to my colleague, Marci Sanders. And Marci is going to talk on these next two slides for us.

Marci Sanders: Great. Thanks so much. And welcome everybody. I'm so excited to share with you this tool that we've developed for FEMP for the use of selecting and looking at products that are already determined to be eligible for your purchasing. To start with though, I'm going to take you through some of the basics of the LED Lighting Facts Program which is a program that is sponsored by DOE. First and foremost it is at lightingfacts.com. So it's a website. And it uses very advanced product search for all solid state lighting product types. So, we're talking luminaires, lamps, retrofit kits, indoor, outdoor, different mountings, all kinds of applications. Pretty much any application there is for LEDs is represented in this database. It is easily searchable, you can search and download Excel spreadsheets of your search. There is also a comparison tool you can use. The entire database is driven by submissions that come from manufacturers. So it's the data that they submit about their product performance verified by the LED Lighting Facts team. There are products submitted every day, we average about a 1000 products submitted every month. The program is about five years old now. It took six months to get the first six products on the list. Since then it has exponentially grown year-over-year, quarter-over-quarter and almost month-over-month. Six months ago we were at about an average of 500 products submitted every month, that has now doubled. It is just the facts. The performance data backed by test reports -- there are no thresholds, there are no bars set for performance. They are what they are. What we've done is we've created a special portal for FEMP designated -- that is actually powered by the LED Lighting Facts database. It has its own URL which is lightingfacts.com/LFpowered/FEMP and it has the same advanced product search functionality and interface as the main Lighting Facts search does. But it displays just the products that meet FEMP guidance that are generated by the Lighting Facts dynamics database.

Basically, what we've done is taken what is the Lighting Facts search on the left hand side from LED Lighting Facts -- that's the search page, that's the products page -- and we've created this new portal called FEMP portal that looks like FEMP. It has the look and feel; it is customized and it is just a search of the products that are selected by virtue of the rule set that FEMP guidance has against the Lighting Facts database.

So from there, I'm going to take you live to the website and show you exactly how it works. This is the Lighting Facts website. Again, lightingfacts.com. Pretty easy to remember. This is the home page. You can scroll down and see the total amount of products that are on the database today -- at this moment -- 13,850. And other additional information about partners that are involved. There are 1,445 partners. There are 83 approved labs that are approved for manufacturers to do their testing which is primarily

the LM79 photometric testing. There are currently 18 energy efficiency programs that use the Lighting Facts database to identify products that qualify for their programs.

Right now, I'm going to take you to the actual products page for the products search and give you a quick demo of this main Lighting Facts product search page. And as you can see, we've got this scaled graphic that shows how many products over time have entered and have been approved by Lighting Facts. We've actually got a link to the FEMP acquisition guidance and I'll show you a link back at the home page as well. Two different places to go to get to the FEMP page. But for now, I'm just going to show you the Lighting Facts page and take you on a quick search. We search by product type first. In this case, I'm going to be searching for a parking garage luminaire. So I'm going to click luminaire first and that's opens up all the product categories, use location, mounting base that might apply. The more high level your search is the more prospects you're going to pull but the more you drill down, of course, the more refined the search is going to be. So for this search, I am just going to pull luminaires and parking garage as a product category. Just to see what we're working with to start with actually in terms of the total number of products. The FEMP guidance rule set is 70 lumens per watt, I'm going to change the selection to 70. And those are the only selection I am going to make for this search but here are additional product metrics and options that you have that you can refine the search even further. The five required metrics for Lighting Facts are these five metrics up here that are colored. All of these additional product metrics are optional metrics that all come off the LM79 test report that can be reported and listed by the manufacturer if they chose to do so. If they do, we do verify it.

There are a number of different opportunities here to further define the products by whether they have warranties, whether they have been verification tested, whether they are ENERGY STAR qualified. DLC qualified, etc. But for now, I'm just going to pick those two high levels, just to see what we are dealing with in terms the FEMP designated rule set if you only have Lighting Facts to go by for this exterior product category. This brings up 374 products that are qualified based on the criteria that I just entered in. This list of 374 is completely downloadable and you can also download a full list of the 13,800 and some products if you still wanted to do so. With each of these tabs – each of these obviously represents a product – but each of them also has the basic label metrics that are required by Lighting Facts. So, every single product is listed with, and verified for, these five label metrics as well as a model number – and other information. But more information is available by clicking on the View More Information icon and then it pulls up all the information the manufacturer has submitted for that product including a spec sheet, a description of the product, when it was approved, what kind of availability – its available but it's made to order, and other additional metrics that might have been added and verified and – added by the manufacturer and verified by our team.

There's a compare function as well on LED Lighting Facts. You can compare up to four products in a side by side comparison by just clicking on the Add to Compare and then it gives you a nice visual comparison of just those four products side by side and all the metrics that are included for all of them. And as you can see, with the optional metrics, they don't line up as well because not every manufacturer lists the optional metrics.

And I wanted to show you the home page as well -- very quickly. For federal users if you just click on lightingfacts.com and then click on federal users it will take you to the FEMP portal that we have for LED acquisition guidance. As you can see, this has the look and feel of FEMP, it doesn't look like Lighting Facts anymore. We've got the product details which show the six exterior product categories that Jeff just talked about as well as the rule set which is the minimum efficacy requirements for each of these categories and then the total products by category for each of these categories – the total number of

products that are eligible based on this rule set. This group of numbers changes as the products come into the Lighting Facts program and are filtered with this rule set. Then there's some information here - links to the FEMP acquisition guidance. You can download a full list here. Here is your total product count which also has the same feature as Lighting Facts - the main Lighting Facts count chart has. And just so you know, it was about just this point in time, that we completed this portal for FEMP and at that time we went live there were about 1667 products that made the grade for the FEMP designated group of products. Today, we're up to 2836. Like I said, this is a dynamic system. This number will change all the time.

Go ahead and scroll down to the customized search portion. It is a little bit different than the Lighting Facts search - we've only got the six product categories. You pick them by category. We've taken the guessing out of it that you kind of have to do with the Lighting Facts selection. We've mapped all exterior categories from Lighting Facts to this portal for you. You can choose from any of these categories to do your search and what I'm going to do is select the same search that I did before. I'm going to select the parking garage luminaires - now remember, they already meet the 70 lumens per watts criteria. Every parking garage luminaire in this database is going to have those 70 lumens per watt selected. I'm going to select - and then move on down here to the required label metrics and they look a little bit different just because they are vertical instead of horizontal. I'm not going to make any further changes or selections but you can take each one of these if you wanted to look at higher levels than the basic level that is already in the search or that has already been searched for you. Then I'm going to add some metrics. It's the same additional metrics that are available and I'm going to do a search - actually, I'm going back to the main metrics and I'm going to look for a CCT above 5,000. I'm going to select products that are available today - in stock. I'm going to base my search on that and then I'm going to do another search after this to whittle it down a little bit further. That gets us from 374 products, for the whole set, down to 81 products that meet that search criteria. That additional search criteria just based on upping the CCT to 5,000 products, kelvin and over and then selecting the availability of products that are available in stock. Then, if I wanted to, I could I can also click on the warrant and look at a warranty of let's say, five years and see where that gets us. So, six products come up that are available from the search criteria that you've applied against the already narrowed search for parking garage luminaires based on the efficacy of 70 lumens per watts - that you start with 374.

So that's how it really works. It's pretty simple. There are a lot of user guidance tools for you with all these little question marks that have pop ups that help you understand each of these terms. We've also got further expandable qualifications that you can apply to your search. You can also just type in a brand or model number or a manufacturers name and run a search just according to that. For every search there will be a Download Results, Download Full List. To View More tab is the same as Lighting Facts with all the information on each product viewable as well as the Add to Compare tool for comparing products. The challenge that you have is that it is not easily on one screen, you have to scroll up a little bit. Hit that. We have a nice little side by side comparison of the metrics and performance data on each product.

With that, that's a quick and fast tour of the FEMP site as it relates to Lighting Facts. You can also go back to Lighting Facts easily by clicking up here. I will conclude my tour and I will turn it back over.

Linda Sandahl: Great. Thank you Marci and thank you Jeff, as well. We are out of time, and I'd like to thank everyone for participating in today's webcast. For those of you who are representing federal sites we encourage you to join the LEEP Campaign and take advantage of the resources and free technical assistance that is provided. And again, you'll just need to go to leepcampaign.org, sign up, and if you are

with a utility or other sites, you can still join LEEP but as a supporter. Again, go to the leepcampaign.org site and you can learn more about being a supporter. The slides from this webcast will be posted on the FEMP website soon. And if you have any additional thoughts on tools and resources that you need to help you incorporate high efficiency lighting in your exterior sites, send us an e-mail or otherwise contact us, we would love to hear from you on that. So again, thanks for participating in this webinar brought to you by the Federal Energy Management Program.