

Andy Mitchell:

All right, let's get started. Welcome ladies and gentlemen. I'm Andy Mitchell with the U.S. Department of Energy. I'd like to welcome you to today's webinar "Save Energy and Money in Troffer Lighting Join the Interior Lighting Campaign Now", brought to you by the U.S. Department of Energy's Better Buildings Program.

We're happy to have as our speakers today, Michael Myer of the Pacific Northwest National Laboratory, and Bill Conley of the Yamaha Motor Corporation. Bill Conley is the facilities manager for Yamaha Motor Corporation based in Cypress, California. He has more than 40 years' experience in facilities management across different buildings and has been a proponent of sustainable operations for over 25 years. So, he is certainly no rookie. Bill has worked on lead projects in other sustainability practices and was an original member of the International Facilities Management Association (IFMA's) sustainability committee, an integral part of the sustainability facility professional credential, and authored two how to sustainability guides.

Also joining us is Michael Myer. He's a senior lighting researcher from the Pacific Northwest National Lab. Michael has been with the lab since 2007. He'll be talking to us today a little bit about the advantages of energy efficient interior lighting as well as some of the logistics for those of you who are considering joining the Campaign. Michael was involved in several major lighting programs including Appliance Standards, the Lighting Energy Efficiency Parking Campaign, this Campaign, and other market transformation programs. He has written many papers and journal articles. He received his MS in lighting from Rensselaer Poly Tech, and has the LSU Lighting professional credential since 2003.

OK, with that I'm going to give a brief introduction to the Better Buildings Initiative, hopefully to give some context for where this Interior Lighting Campaign fits into our overall strategy. After that, Michael Myer will give us an overview of troffers and the Interior Lighting Campaign. And then we will hear Bill Conley from Yamaha talk to us a little bit more about the process they are going through there and then we will do some Q&A at the end. So some information on the Better Buildings Challenge. The Better Buildings Initiative is made up of the Better Buildings Alliance and Better Buildings Challenge. The goal is to make commercial industrial buildings and multi-family housing 20% more efficient in ten years. Through the Better Buildings Alliance members from different market sectors work with the U.S. Department of Energy's exceptional network of research and technical experts to develop and deploy innovative and cost effective energy saving solutions that lead to better technologies, more profitable businesses, and better buildings in which we work, shop, eat, stay, and learn. So, these voluntary demonstrations go on across the spectrum of buildings in the U.S. They're voluntary demonstrations of energy efficient technologies; companies use our resources to determine whether or not to proceed. Others are then able to demonstrate their leadership.

We spend more than 200 billion dollars each year as a nation to power our countries commercial buildings. The goal of the Better Buildings Alliance (BBA) is to bring that number down and to do that without affecting productivity. True efficiency means doing the same or more while using less. In this case were talking about using less energy and spending less money on it. Once we're spending less money on it, that capital is freed up so that we can spend it on reinvesting in the American economy, hiring more workers, purchasing more American made equipment, investing in more American companies. Lighting is a key opportunity to that. That's what brings us all here today. It's also one of the reasons that energy efficiency efforts generally have support from the business community as well as sustainability advocates. They also have broad bipartisan support here in Washington.

Just a quick overview of some of the companies and organizations that are affiliated with the Better Buildings Challenge, a lot of names you recognize, iconic American brands, maybe your Alma Mater, or place of business. I just bring this up to emphasize we do have a broad reach. We do have a lot of momentum and a lot of support. So next, "why do partners join the Better Buildings Initiative"? It's pretty straight forward and these three reasons are going to carry over to the Interior Lighting Campaign. Number one "access to experts, tools, and resources", we hear from our members a lot that their primary source of information is sales reps. Those sales reps have a tough job to do, a valuable job, but sometimes it helps to have an independent third party source for information and our experts, tools, and resources provide that.

Second reason "peer to peer learning". We provide best practices. For instances Bill today is going to tell us a little bit about how Yamaha went through their process and we can use that to learn. Case studies; implementation models are available on our website. Peer to peer learning is a key part. Then finally public recognition. A lot of our members of the Better Buildings Alliance (and certainly if you decide to join the better Interior Lighting Campaign) may already have a project in the works. You may have done some pretty incredible things in interior lighting recently. This is an opportunity for you to get recognition for that.

Next up, again just trying to give some context of where this fits in. The Better Buildings technical teams; we do separate out technical solutions into eight categories. Lighting and electrical is one of them but it is certainly probably the highest profile. I think many people in the meeting today are aware that lighting has one of the best financial returns of any project, particularly if you are moving from an older system to a newer system. It also lights up bright, so if you do a lighting upgrade it's something that is highly visible to your employees, to your visitors, it's something that shows that you are making an effort and doing a good job on energy efficiency. Conversely if you have lousy, old outdated lighting, most people can see that pretty quick when they visit your facility. So there is that to keep in mind.

Moving forward, just to explain a little bit how we as the Department of Energy decided to focus on interior lighting. We basically take input from our Better Buildings members and we combine that with a more technical analysis of energy conservation measures that we include in our P-TOOL, our

prioritization tool. So we go through some 20 different criteria when we evaluate these technologies, such as the ones we recommend on the Interior Lighting Campaign, and were evaluating them for unit savings, national technical potential, deployment readiness, are they ready for prime time out in the market place and is marketing and manufacturing in place so they are cost effective, do they have a high potential. We rank order them, hundreds of them. What we do is come up with a list of high impact technologies that we focus on.

When we recognize those high impact technologies we will start campaigns around them. Two current campaigns that are going on are “Lighting Energy Efficiency in Parking”, that is upgrading parking lots, and the Advanced Rooftop Unit Campaign. You can see an Adidas store there in New York City. You can’t see the roof top units but they’re there. Adidas did a fantastic job providing some backstory on the units they chose and how they went about doing that. We intend to offer the same service on the Interior Lighting Campaign.

Next up, to the question why are we focusing on interior lighting, why an Interior Lighting Campaign, and why troffers? Well, when we rank ordered these different energy conservation measures. The 2x4 lighting troffers with control came up as number one. They are everywhere, Michael is going to get into this in a second, but whatever room you’re in right now there is a better than average chance that if you look up, you are sitting under a troffer. Making them just a little bit more efficient can have a profound effect on energy use and capital in our nation. So with that, I am handing it off to Michael to talk us through some of the technologies we are recommending and the process of joining the campaign. Michael, take it away.

Michael Myer:

Thanks Andy. Andy did a great job highlighting everything that I’m going to talk about and gave you a great preview. I want to reemphasize – energy, energy, energy, lots of savings potential. Troffers are high energy using devices in mass quantities. Also moving beyond energy savings we are now seeing some non-energy benefits. When you replace the fixture they’re able to couple with either center technology for wayfinding in certain building types or possibly combine it with other sensor types. So, we’re finding in the process people are economizing different choices they are making by adding in multiple sensor types and by going to a new fixture or new guts of a picture are able to get more value out of what your existing light fixture used to be.

We keep emphasizing energy. Roughly 2.6 percent of all primary energy used in the U.S. is related to lighting. That translates roughly to 1% of all energy. When we say primary it means everything that goes into the power plant or transportation fuels. So if you think about all the energy used in the United States, troffer lighting alone is about 1 percent of that. It’s pretty significant. Bringing it back to buildings, about 20% of your building energy usage is lighting, and troffers are typically 50%, it varies by building type. Andy also mentioned that these are ubiquitous. There are roughly 367 million troffers in

the United States. I like this graphic of a man with a lightbulb it reemphasizes that there is roughly 1 troffer per person in the United States, or if you think of your building portfolio in terms of square feet, one troffer for every 240 square feet of your building. Many of you on the phone probably have millions or even billions of square feet under your control or management and that's a lot of troffers that you have to think about.

Now we're going to get in to some of the technical specifics, just an introduction before we get into the lighting campaign itself. Efficacy is the conversion of one into another. The easiest thing to think about is miles per gallon in a car. We rate light fixtures in luminaire efficacy rating, that's typical for a lot of fixtures to be in luminaire efficacy. They are very similar terms. The key thing to understand there is you might have a fresh light bulb that is extremely efficient, but that doesn't mean that the fixture itself is efficient and we'll discuss that in a second. Constantly I am asked questions like "well my fluorescent light bulb is at 90 lumens per watt, why am I not competing with other technologies". And the answer to that is when you put it into a fixture, you are losing light output. So your fixture is less efficient, so you have to think about it from the holistic lighting fixture point of view. This slide does a great job of showing all the different types of light fixtures out there. Starting from the upper left those are the earliest type of troffer and are about 70 lumens per watt. Moving all the way down to the bottom right, these are the relatively newer troffers that were originally fluorescent at the time around 2000–2005. These are pretty efficient; they are 73 lumens per watt. So, the key thing to take away from the slide is there are many different kinds of troffers they come in 1x4 foot configuration all the way up to 2x4 foot configurations and depending on your optical situation you're choosing your efficiency or efficacy will vary.

That moves into the next slide. If you think about all troffers in general, they are roughly 66 lumens per watt per troffer. Why that's important is that is pretty much near the top peak of fluorescent technology. We are seeing some gain, some outliers that have really pushed it, but we've also seen now some LED troffers and either super high end fluorescent and/or LED troffers now are coming in at 85-120 lumens per watt. That's a significant energy improvement just going for one for one replacement. It's a great example you know, you could buy the Honda Civic, they're a fuel efficient car already but then when you start considering your other options such as the Prius not only are you gaining more fuel efficiency you are gaining other benefits and other features. That's a key thing we will keep mentioning. We're finding that as people consider other technologies and other choices it's those features that help them make certain economic cases or benefits that they weren't expecting.

That brings us to the troffer conundrum. What do you do? You have fluorescent lamps – do you consider other fluorescent options, just replacing lamps one for one, or other modifications? Maybe you think about TLEDs or tubular LEDs as we call them, you could use form LEDs, form factor 2, or maybe a retro kit, which is where you leave the housing itself and pull out the guts, or possibly a new fixture.

The troffer conundrum is really about 8 different options, starting at the top which is “do nothing” which saves no energy. Then as you move down the list from doing nothing to replacing the lamps to replacing the guts and making it a kit or a new fixture. You will see that your energy savings potential only increases. Your risk also varies depending on what you choose. Some of the options that exist out there such as replacing the lamps while might be cost effective on a first or early analysis brings some risk. There was a recent recall, some T-LEDs that have made the news and people have been talking about it. Also, when you start pairing them with controls you may not get your desired result and that’s something to think about. So again, your options really are doing nothing to possibly adding a new fixture and energy savings range as well as cost options. At this point I’m going to highlight two different, (as Andy mentioned) case studies. These were presented at the 2015 Better Buildings Summit. The first one up is MGM Resorts. This is a new IT space in Las Vegas supporting the casino and hotel – MGM Resorts of all their myriad of places. They’re replacing about 800 2x2 troffers and they managed to see a 68% energy savings. This slide really just kind of covers what they did. They actually added in controls. They actually analyzed everything mentioned as part of the preview “the troffer conundrum”, where they listed just replacing it with certain types of lamps and they listed all the way up to new LED fixtures coupled with controls. They noticed a significant difference from option 1 to option 6 in terms of their energy usage. It’s almost a factor of 4 in difference as well as the cost of ownership change by a significant difference as well. They were able to realize almost a 25,000 kWh saved annually. In addition they found that there were additional benefits and additional cost. So what they did for the LED troffers is they went to a distributed kind of network for the best way to describe it, where there is a power supply that in a spider pattern that controls four or five different fixtures. In the process they were able to train their contractor on the process and reduce costs. They actually, you know, monetized what is the cost for conduit, what is the cost per switch, where does the labor fall for all of that. Not just how much is it per fixture and what is our energy savings and the contractor benefited from that because they were able to sell the jobs based on knowing more about controls and LEDs. MGM was able to sell the job to their management and their internal economics teams because they were able to think through every different aspect of the economics not just first cost of the fixture itself.

Another case study that was recently presented at the 2015 Better Buildings Summit was Princeton University. This is at the Carl Icahn Lab – they also happened to be replacing about 800 2x2 troffers. I don’t know what it is about that fixture type and quantity but it just happened to be about the same thing. They were able to realize a 24 percent savings, that’s just on the equipment, and then they’ve added in controls. Their control system just came online so we don’t have M and V about that yet. What’s unique about this is they did not actually replace the entire fixture. They went with the retrofit kit. The reason why was that they found that labor was prohibitive in replacing their whole fixture at their institution based on their economics. They did actually incorporate with the retrofit kit wireless sensors and they also were able to talk to their larger building control energy system. They found that they were able to archive equal or better lighting results. The table below shows the mean results, the mean illuminance (which is the light falling on the work surface), as well the max to min (which is kind of

an idea of how the values vary across the space), and in both the LED cases they were actually able to save energy and actually get more light in the process and they're quite happy with their results.

Moving into the Interior Lighting Campaign; it was officially launched at the May 2015 Better Building Summit. It is co-sponsored by BOMA, the Building Owners and Managers Association, the Department of Energy, the U.S. General Services Administration, the Illuminating Engineering Society, and the International Facility Management Association (IFMA). Their URL there is [interiorlightingcampaign.org](http://interiorlightingcampaign.org) and if you are tweeting about it or using other social media we do ask that you use the hashtag as shown there that we use, just so we can keep track of things. Why do these organizers come to the table? Well first, the Department of Energy is very interested (as Andy mentioned) about the Alliances in promoting energy efficiency and gaining building efficiency. So that was a natural fit, because of the high energy usage of troffers. BOMA likes to claim that their tagline is if you don't sleep in that building they probably manage it. So essentially office, commercial, and industrial spaces are BOMA's portfolio. Troffers are a fair amount of their energy usage in their lighting and they're interested in helping their members also achieve energy savings. Illuminating Engineering Society; this is a trade group in the United States where they promote lighting recommendations and lighting guidelines. They were a fit because they were interested in helping people find out about better lighting options, better lighting quality, and other metrics. The U.S. General Services Administrations; they have the unique position of being both a co-sponsor as well as the largest potential participant. They have over 1.5 million troffers under their auspices alone. They're interested for that reason probably more than anything else but there are other reasons for their interest in a sustainability effort. And finally, IFMA is both a member and a participant, and we'll hear more about them later. They also are managing about 39 billion square feet. Again, building managers are responsible for the efficiency of the building and cost which is always something everyone wants to bring down. So, they're interested in members learn more as well. The goal is pretty straight forward at the moment, it is 100 thousand troffers either retrofit with new tubes, kits, or new fixtures, or new construction that meets the requirements specified on the website by May 2016. This roughly equates to 10 million square feet of lighted area or 5 million kWh saved annually or about 450 homes energy usage. That translates to half a million dollars in savings and everyone likes that.

As Andy mentioned in the beginning, one of the things the Department of Energy's Better Building Alliance does is try to recognize people. We've found through some friendly competition and positive peer pressure that the awards process related to campaigns is a desired effect and people like it. So we are actually providing rewards as part of the Campaign. They are both for new construction sites and retrofit sites. For buildings of various sizes, we realize a bank may not be able to compete with a large box store so depending on the number of troffers in the building; the awards are tailored around that. Also, the awards are tailored around organizations that do multiple sites or organizations that are deploying very novel uses of controls related to troffers. We keep emphasizing energy savings and replacing fixtures will get you most of the way there or half the way there depending on choices. But

controls really take us the next step and really push the energy savings up even more and there are people out there who are really cutting edge with controls and we'd like to recognize that.

There are two different types of entities that can participate in the Interior Lighting Campaign. They can be participants and we'll learn more about who they are and what they are. The second is supporters. These are people who are less likely to manage lighting specifically but might be either a utility or an engineer, people who play a role that is important but don't ultimately make the decision on replacing equipment or have to pay for some of it.

Why become a participant – benefits and features. It's easy. The first reason is limited technical assistance; the Department of Energy is providing through third parties some technical assistance. I say some, because ultimately they can't actually have people out there doing design documentation. If you have questions about either a specific technology, concerns about some of the different terms you are hearing from manufacturers or your colleagues, there is a lot of change happening in the lighting industry right now and you need to pay attention to it. So the technical assistance can answer some of your questions and help you figure out some of that. Also, if you have some specification guidance or need help in reviewing or writing an RFP, some of the technical assistance can come in through that as well. On the website we have lots of information that you might find beneficial. There's a specification that you can take and incorporate into an RFP if need be. There are case studies and fact sheets, we'll see more about these in a second. Also, a reason you might want to participate is recognition and a possible award for your good energy efforts.

As I mentioned, here are some of those resources. We've also envisioned technical assistance. We've gone out and polled all the different utilities, as many as we could find in the United States, and focused on what incentive they offer specifically related to troffers and or controls and we have a spread sheet you can download and sort by your location or your utility. You can say "oh I want to replace this" and you can go try to find what's available for you. It especially works great for those multi state owned organizations where they have to try to keep track of many different utility programs. We also have a lighting project evaluator. This is a web based tool that maybe if you are considering a couple of different options you can provide input some information into the project evaluator. It will also factor in the use of controls and give you some comparisons without you having to put in a lot of effort.

Here is a screen shot of the Interior Lighting Campaign website. It's very easy. The key thing here to take away is it doesn't take much to join. As Andy mentioned earlier, and especially in our survey, there is low commitment to do anything. We're not taking money. We're not following up with you to harass you. We might actually reach out to you to offer assistance or answer questions. This is an early, easy, way to join and you get a lot of benefit out of it. Another screen shot here mentions that it takes probably ten minutes or less than ten minutes depending on web savviness and basic information you know about your organization to join as a participant or as a supporter.

Why you might want to be a supporter? It will help promote your efforts to your customers or to people who you possibly didn't know could be your customers. Whether it is an incentive program or basic information you want to get out related to the Interior Lighting Campaign. Here is a slide of some of the founding supporters. You will see on here a lot of utilities. There are some non-government organizations as well. This list is growing as well. If your organization is not on here, hopefully we can get your organization on here.

At this point I'm going to turn the presentation over to my colleague Bill Conley from the Yamaha Motor Corporation who is going to discuss Yamaha's efforts. They're upgrading some of their facilities to troffers.

Bill Conley:

Thanks Michael, go to the next slide please. I am the facility manager for Yamaha Motor Corporation in Cypress, California. We are the corporate offices of the United States Enterprise here that handles motorcycles, ATVs, off-road vehicles and stuff like that. We have about 287 thousand square feet here. It's a multi-function facility. As you can see we have offices, we have new business planning, and we have R&D (which is like a testing lab), and accessory distribution (which is a warehouse). Each of those different areas features different lighting applications and that's the thing we are going to be looking at. As a facility manager my job is to provide sustainable operations. I want to save money. I want to save energy and also improve the quality of life in the work place. Lighting is one of the easiest and most cost effective ways to achieve those goals. Yamaha joined the ILC in order to be part of a campaign that affords us the opportunity to become more sustainable. We want to do this. We know that ILC will help us do this.

So our lighting challenge is energy. We might as well say that lighting consumes a significant amount of energy and we can cut that down easily. Using LED tubes as a baseline; my preference is LED, I know there are long life fluorescents out there too but I'm really focusing on LEDs because of some of the benefits they offer to us. Its simple math, if you put a 16 watt LED tube in and replace that 32 watt T8, that's 50% savings right there. You've cut your energy consumption by half. Another thing you have to understand too is every three watts of lighting you cut you cut the need for 1 watt of air conditioning. As you put in lower wattage tubes, you are cutting down the heat load and LEDs also run cooler than T8s so you are saving energy in your air conditioning too. Another issue we have is replacement of the current T8s. We've estimated here that it's about \$75 per lamp to replace a lamp. A person has to be called, they have to mobilize, they have to respond to the area, they have to replace the lamp and they have to discard it. So that's \$75 per. Last year we replaced 1,470 T8 fluorescents and 242 ballasts. Based on that \$75 per event, that's about \$128,000 in labor that we would have been able to save if we had had LEDs that lasted longer than the T8s did. T8s may be less expensive short term, but compared to the life of the LEDs it's not a good option for us. With high efficiency troffers and LEDs we can see energy savings and minimal replacement costs.

So we have 3,201 troffers in the facility holding 7,860 lamps. Except for our exterior lighting, it is one size fits all. They are all T8 32 watt fluorescents. Lighting applications as I mentioned in the first slide, there are different needs for different areas. Reconfiguring and going through a retrofit would mean we would be able to replace appropriate lighting in appropriate places. For instance, in our warehouse you probably only need 24 foot candle at the floor level to see well. At a desk top it is 32-34 foot candle. In our R&D labs, you need above 74 foot candle at the desk top. So we would be able, when we do the reconfigurations, to make sure we have appropriate lighting and not waste lighting in any of the areas.

This is a picture of a typical office layout. You can see the rows, and rows, and rows, of the 2x4 troffers. You can't see that off to the left there are a lot of windows. Our facility is really surrounded by windows. We have 7 foot windows just about everywhere, which give us the opportunity for daylighting. ASHRAE Standard 90.1-2010 has actually stated that you need photo sensors within 15 feet of glazing if you're retrofitting your building more than 10%. You have to have controls on there so if we went this route we would basically be forced to do controls. So, cost notwithstanding it's something we will want to end up doing and Title 24 here in California and the Federal Government are both close to adopting that standard for their federal facilities and new construction here in California. Controls between photo cells and occupancy sensors would really help us cut down on our lighting in the office there.

Here is another look at another office. Again you can see the rows and rows of troffers there. Any time we have to go in and replace lighting, of course, causes a work disruption. Also, if you look we have no task lighting on our desks. However aisle ways, hallways, and stuff like that don't need that amount of light. This gives us a good opportunity to do de-lamping, go down to a 2'x2' instead of a 2'x4', because we don't need all that light. Another good thing about LEDs too is what I refer to as target efficiency rating (TER). It is kind of like lighting efficacy rating but target efficacy rating is basically how much light is actually reaching the target and because LEDs are more directional they provide a better application in some of these office settings.

So this is a hall, one of our halls that we have. This one is about 600 feet long and again on the left side you can see all the glazing we have here. This is way too much light for a hallway which basically just needs wayfinding. There are no tasks that are going to be performed here unless there are hijinks, or something. Again a great opportunity for photometrics for daylighting, for daylight harvesting, for de-lamping, you know cutting down all that light. Going to high efficiency troffers would help us do that.

Here is a picture of one of our stairwells. Those used to be T-12s. I got that and changed them to T-8s which is fine for now. You don't even need that amount of light for accent lighting. A couple of canned LEDs and it would work fine. That would save us 'X' amount of energy on that.

One of our major challenges we have is our warehouse. Most of it is highbay lighting. It's very time consuming to go in and change out these lamps. Again we do a 1 to 1 and we don't do any group re-

lamping. Every time a lamp goes out or ballast goes out we have to go up and replace it. We need to use a scissor lift or, if there is not one available, we need a forklift with a cage which makes it a two person job. Where we estimated \$75 per lamp replacement in the office setting, in the warehouse I'd say at the least it is double —\$150 or more to replace each one of those lamps.

Some of the issues we have is fixtures that are over the racks, they are very hard to get to or inaccessible. The age of the fixtures is something we are concerned with in the warehouse especially. We are experiencing arcing at the sockets. We've had actual flare ups and fires up there. Luckily they go out quickly and the socket just burns itself out. However it's definitely an issue showing the age of the fixtures and the age of the troffers. Plus if a fire starts up there, you know, it's really hard to access. So again, it's another good argument to change these out to good, new troffers with LED lamps where we don't have to climb up there three or four times a week and spend time and money on it.

So, my rationale for retrofit: energy efficiency. Again, replacing a 32 watt with a 16 watt that's 50% reduction right there. The lamp life, LEDs last 4 to 5 times longer last time I looked. I know the long life fluorescents probably have a longer life span, but even so, LEDs are a better idea. Lighting quality, we want to make sure we have the appropriate lighting in the right spaces. Control, so that we can control minimizing energy use and then minimize our replacement needs.

So, our options as Michael mentioned earlier. I want to go LEDs personally; we can do a lamp for lamp. We can do a retrofit kit or troffer replacement. There is a cost to each of those obviously; they escalate from \$30 to \$350 per unit. ROI could be anywhere from 21 months to 36 months. Something I keep telling my groups is basically that ROI is important but when you finally balance the books, your energy savings don't stop. You know, your lack of need to replace lamps doesn't stop. The best way to look at the impact of replacing troffers and going with LEDs would be through a net present value calculation and go out over 20 years which is the life of an LED and look at the major impact of cost savings and energy savings. Again, ROI is fine if the ROI is reached. The energy savings continue. People have to understand that this is a long term solution not just a short term solution.

Here are some pictures of some defunct troffers we took down. Gone but not forgotten.

Here are some calculations that Mike put together for me. This is what I call conservative speculation on what we can do. It's talking about 19 watt LED lamps. We're not sure, 16 or 19; we would have to look at the application. We based it on 2,080 hours which is our standard work week, 40 hours a week. These are some of the things we look for and some of the ammunition that I plan to bring to bear in a good argument. That's the beginning of our story. Keep tuned to the ILC web page you may see a case study in development – ours.

Andy Mitchell:

Save Energy and Money in Troffer Lighting Join the Interior Lighting Campaign Now Webinar  
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We are at the top of the hour now and I would like to wrap up. I would like to thank everyone for joining us and just direct you again to our website (final slide) [interiorlightingcampaign.org](http://interiorlightingcampaign.org). This is a government website; we started off with an “.org” because of our partnerships. We were not able to get to everyone’s questions. Please do contact us through this website. We are very eager to entertain your questions. I hope this was helpful for the attendees for those considering joining. We welcome you to the Campaign whether you have one fixture or one million.

Everyone have a great day. Thanks.