

*John Jameson:* Hello everyone, and welcome to today's webinar for members of the higher education sector of the Better Buildings Alliance. My name is John Jameson, account manager for the higher education sector. Our goal today is to provide you with an overview of Better Buildings Alliance tools; resources and activities that will help you accelerate energy efficiency in your building portfolio. So before I get started, I'd just like to address a few housekeeping items.

We will be answering questions at the end of the webinar. You may enter a question at any time through the question pane in the webinar panel on the right-hand side of your screen. And following the webinar, we will be sending out the slide deck and a link to the recording to each of the participants. Okay. And joining me to present today, we have Kirsten Taddonio, Better Buildings' higher education sector lead at the Department of Energy.

Deb Cloutier of JDM Management to give us market solutions team updates, and Amy Mitchell, the technology solutions team lead from the Department of Energy. So if you have any questions regarding the information we will review that's not addressed in the question and answer period, please don't hesitate to reach out to anyone listed on this slide for some more information.

So we'll begin today with some updates from the Better Buildings Alliance program, followed by an overview of the technology solutions activates, and we'll use some remaining time to hear about market solutions team updates. So with that, I'd like to turn it over to Kirsten Taddonio to provide some programmatic updates over at Department of Energy.

*Kristen Taddonio:* All right. Thank you very much. Let's go to slide four. I'm looking at the attendee list here, and I see some familiar names, and also some new people. So I thought I would begin by giving a brief overview of the Better Buildings Alliance and how it fits in with the Better Buildings' Initiative. The Better Buildings Initiative is a broad based government-wide effort that's seeking to accelerate energy efficiency in U.S. buildings, government buildings, and private and public sector buildings.

And the Better Buildings Alliance is really a key element of the Better Buildings Initiative by partnering with organizations across the United States, and the diversity effectors were able to collectively make a greater impact than we would be able to individually or alone. Better Buildings Alliance members that

stand up and commit to a greater level of transparency, and also a 20 percent savings target over ten years or less are also eligible for high-level recognition through the Better Buildings Challenge. But today we're gonna talk about the Better Buildings Alliance.

Next slide, please. So the Better Buildings Alliance welcomes members in a variety of commercial building sectors. And here at DOE, we define commercial building very broadly, so that includes higher education facilities naturally. And, currently, we have over – or nearly 200 member organizations in the Better Buildings Alliance, and, collectively, these organizations control or manage over ten billion square feet of space in the U.S. commercial market.

Now, according to the latest numbers from our energy information agency, that told us that people within this alliance represent about 11 percent of the U.S. commercial building sector. So that's fairly significant. That's a big impact we can do that we'll make together. So members agree to participate in at least one energy savings activity per year, and share successes with their peers, and inform DOE about their progress in meeting energy efficiency goals for their organization.

And in turn, DOE committees to connect members in the Better Buildings Alliance with technical resources, provide a platform for pure exchange, and keep you all in the loop on opportunities that can help improve energy efficiency in your buildings. Next slide, please. So although we only really got started in 2008-2009, already our members are accomplishing a significant amount. We already mentioned our collective impact and representation in the U.S. market, but we have a very active membership.

We have over 50 energy-saving activities for members to choose from, and most of these activities are conducted under our 13 teams. Today, we're gonna hear the update on what those teams are up to. And in terms of results, where the rubber really hits the road, our members are reporting that increasingly, their corporate leadership is setting a high-level energy savings goals.

And of those who have set goals and reported their energy savings to us on an annual basis, people are seeing – well, at least last year, they saw, on average, almost a three percent energy intensity improvement, so more than a two percent improvement on an annual basis. Next slide, please. So higher education members constitute the newest commercial sector in the Better Buildings Alliance, that already have a fairly impressive group here.

I want to highlight in particular the members unlined in bold. Those members have also stepped up to take the Better Buildings Challenge seeking to advance energy efficiency in their universities by setting a 20 percent goal, and in at least one case, a 40 percent energy efficiency improvement goal over the next ten years. Next slide, please.

So every two years, these members nominate a steering committee, and I see a couple people from the steering committee on the call today, and I just want to welcome you and acknowledge the rest of the higher education steering committee members as well. Next slide, please. These steering committee members really assure that our Better Buildings Alliance activities are meeting member needs, and are targeted in a way that can be useful to members in the alliance, sector members in the alliance.

So these are two of the priorities that the higher education helped us identify for higher education members in the coming year. Next slide. The Better Buildings members can join a team to help meet their energy savings goals. Or if you go to the next slide, you can take advantage of resources that have been developed by peers.

Such as implementation models that are developed either by Better Buildings Challenge partners, or in some cases, alliance members, Better Buildings Alliance members interested in working with us to fulfill their activity requirement by developing and implementation model, and are welcome to do so.

So what are these implementation models? Well, they're non-technical resources. They are descriptions about how your organization or an organization has overcome an energy efficiency barrier, or a key strategy that has been applied in your organization that helps you get energy efficiency measures adopted. Basically where the rubber hits the road, and how you actually make energy efficiency happen. So we'd love to develop a whole litany of – or a whole portfolio of implementation model resources, in particular for the higher education sector.

We also offer a webinar series. The next slide shows that couple of the upcoming webinars. And if you happen to see one through our webinar blast that you're interested in that you just can't attend, we always try and make these available after the fact too, so please do visit our website and you can check out any of the upcoming, or any of the previous webinars, and we've been told that they are a really useful resource.

Next slide, please. We also offer in person education opportunities. So, please, if you haven't been invited already, let me be the first to invite you to come to Washington D.C. May 27<sup>th</sup> through 29<sup>th</sup>, where we're going to be having our annual Better Buildings Summit. We expect the opportunity to network with over 800 Better Buildings' partners and stakeholders at this meeting, and early registration is going to be opening up next month.

You can also stay in touch with us. We have a group that is very active on LinkedIn. This is a fun group because in addition to just getting one directional, if you change to the next slide, John. In addition to just getting the information from DOE and the Better Buildings Alliance, you can also get information from your peers or highlight things that you might be doing. So we encourage you to join us if you haven't already.

If you're a social media savvy, you can also follow on Twitter or like us on Facebook, or just sign up for a plain old Better Buildings bulletin and get the e-mail updates. You can also look for us at one of these upcoming events. On the next slide, slide 17, we're planning to have a presence in 2015 at a number of higher education-focused activities and conferences throughout the country. So with that, I am going to turn it over to Andy Mitchell, who is going to talk to some of the technology team activity and updates.

*Andrew Mitchell:*

Well, thank you, Kristen. So we'll turn our focus now to start on the tech teams and tech opportunities. And I guess I'd like to start with sort of a broad overview of what these tech teams do and why. Just earlier today, I was in an all-hands meeting for the Department of Energy office of energy efficiency and renewable energy, EERE, which is the office that the Better Building Initiative is housed under. And we started that meeting by reiterating the mission of our office to create sustainable American leadership in the global transition to a clean energy economy.

In that context, it was very much being compared to other countries, and basically the metric for success was if we can do more and more with less and less, we'll be more successful and remain leaders internationally. It also speaks to the reason that these energy efficiency efforts and these technology teams have such broad bipartisan support. Everyone supports efficiency and using resources more efficiently, and freeing up capital that would otherwise be going to utility companies or up smokestacks to be

used to come up with innovative ideas to higher more Americans to work in these facilities.

So no small task to us here on the tech team. Basically we see the role of these tech teams is to take the wide world of technical possibility and innovation, and make it usable, and make that information useable for our BBA members that join us. And also for all of your peers; I mean we all know, who are running this alliance, we know that you guys are the leaders in the field. What you do will be copied. What you do will be admired and studied and so for that reason, we definitely thank you and appreciate all your effort.

There is definitely a lot of technical progress going on. A lot of opportunity to implement these energy efficiency measures. And one thing that we often hear from BBA members across the sectors is that prior to joining the alliance, their primary source of information was sales reps. That's certainly important, those private companies and sales efforts are critical to the deployment of new technologies. But I always like to point out, if you ask a hammer salesman to recommend a tool for a job, that hammer salesman is gonna recommend a hammer.

And what we do on the tech teams is try to take a more objective approach to be an objective source of information for our members, and to provide a forum for peer-to-peer learning, so that the higher education members aren't just learning from technical experts, but from each other and the experiences that you all have had. The technologies that we choose to address in the tech teams are determined by input from Better Buildings Alliance members, and our own prioritization of high-impact technologies, or a database decision-making tool.

There are eight tech teams, as Kristen mentioned before, and those are divided by technical application, and also by industry in some cases. Each of the teams is led by a subject matter expert from one of our national labs, or from managing and consulting, and they are based all over the country. So with that, let's go forward one slide. And before I get into those tech teams, I want to talk a little bit about opportunities for technology demonstration or tech demos.

A lot of alliance members are demonstrating new innovative energy-saving technologies through real building demonstrations. These tech demos are an opportunity to try to viable, market-ready, cost-saving technologies. Those are the three criteria we need to meet. So these aren't aspirational technologies; these are pilot

programs; these are viable market rate cost saving technologies that we need to basically try out in the field.

So those sites are – they get to work directly with manufacturers, Department of Energy and national experts, and the tech demos provide members with a chance to achieve next generation energy savings and gain recognition for innovative approaches to energy reductions with third party expertise. You can think of it this way. If you participate in one of these three tech demos listed on the slide here, you'd almost definitely have some good material for an update or an annual review, or a newsletter. These are gonna be kind of – these are gonna be some neat programs.

So I'm just gonna go through these real quick for a little story. And keep in mind that we are looking for sites, looking for places to host these demonstrations. The first one: invariant HVAC load reduction. This would be a real good application for commercial real estate, certainly for healthcare, and other applications. It originally grew from a carbon sequestration project, and it is a tech demo that addresses air recirculation in buildings, and takes advantage of a membrane technology that reduces the amount of air, reduces the amount of outside air, in an HVAC system.

Basically all HVAC systems take in a certain amount of outside air to keep the air supply fresh inside. And when they do take in that outside air, they either have to heat it or cool it, and either of that takes energy. So if you can reduce the amount of outside air that you use, while still keeping the interior air fresh, you will use less energy. And so that is the goal of this tech demo, and that is the promise of this technology. Preliminary demonstrations showed a 20 percent reduction in cooling energy use, so certainly substantial, particularly in hotter climates.

Anyway, we are looking for host sites; so do keep that in mind. That's probably three of the most applicable to higher education. Certainly the Building IQ predictive energy optimization tech demo would also be good. It's basically a data-based model that uses building automation system data to evaluate building performance trends, and other factors like weather info, occupancy, building performance, economic factors to determine savings potential.

You need to be in a facility that is 100,000-square feet or greater with digital control at least on the air handling unit, so some criteria there. The last one on this list, the 80 Smith micro combined heat and power CHP. It's a technology that's generally

been reserved for large or massive buildings. Certainly some universities probably have CHP facilities, hospital campuses as well.

There is a micro version now that can apply to facilities that are heating and also using about 3,000 gallons a day. There are some geographic restrictions there. Most likely this will probably be a full-scale food service facility, or something like that. Anyways, if any of these peak interests, please do reach out to us. The contact info is right there. Tech demo at EE dot U dot gov. you can certainly reach out to me also or your account manager.

So let's go to the next slide, and this is really just a save-the-date. Coming up for future tech demos we are gonna focus on envelope retro fits. So that is things like windows, walls, roofing, retrofits along those lines. So please do consider joining us at Oakridge National Laboratory at the end of March. That will be spring in the Smokey Mountains. We want to get your perspective on how we can move forward with real world solutions that will be cost-effective to install, and applicable to multiple building applications.

So please do consider that. And with that, we'll go to the next slide and we'll go into the different tech teams. So first tech team that I want to focus on is the lighting and electric tech team led by Linda Sandahl from the Pacific Northwest National Lab, the one that is based in Portland, Oregon. And lighting is, as we all know, it's a high profile and high value energy efficiency measure. Everyone sees it; everyone notices it, and it's got great paybacks. So it's often times the first energy efficiency measure that a lot of facilities take.

I can say this too, and I'm sure a lot of you can relate, that as energy professional, when you walk into a facility, one of the first things you notice is the lighting. And you take a look, and you can often use that sort of as a bellwether for the overall energy efficiency strategy, or just energy use strategy of any organization. If they're running some old obsolete lights, that's probably a good indicator that they're not too advanced, and, well, probably a sign that there's good opportunity there.

Anyway, when looking at the lighting and electric team, the big highlight for 2014 is definitely the lighting energy efficiency and parking campaign leap, as we call it. It's been highly successful. It's an effort to influence uptake of basically high efficiency lighting in parking lots and parking structures. The graph on the

top right, you can take a look there and it's small, but all you really need to see there is the very clear trend going up and to the right, and really just blasting off earlier this year as the LEEP campaign really built steam. We really wish all the programs could have participation and achievement graphs like that.

So far LEEP campaign has saved 120 million kilo hours annually. That's over ten million dollars back into the economy, and well on our way to achieving a 500 million square foot goal by March of 2015. We'll almost definitely surpass that. So this is gonna be – with high hopes, this will be a success story, and certainly something that people should consider joining. Twelve organizations were recognized in April for leading the way in high efficiency parking.

And as you can see on the slide there, energy savings in some cases can be as high as 90 percent, also a significant maintenance savings. And important to point out too that 90 percent reduction comes from a combination of technology such as LED lights, as well as controls, things like occupancy sensors, daylight sensors, anything that would prevent the lights being used unnecessarily. So those projects that take full advantage of both will be the most successful.

Certainly all of the award winners that were recognized by the LEEP campaign used both technology and controls with different approaches including fluorescent lights, and in some cases induction technology. Current activities, moving down there, obtaining specifications for BBA parking resources, this is your chance to influence what the campaign recommends in terms of lighting performance.

The specs that we generate as part of the LEEP campaign will probably be used sort of de facto standards for a lot of purchasing nationally, and could eventually move their way into building code down the road. So if you have opinions on that, if you have an experience to share, we would certainly appreciate that. You can do that by – you can share that feedback, first of all, please consider joining the lighting team. You can do that by reaching out to me or Linda's contact info is at the top of the slide.

And we'll go to – oh my gosh, yeah, the upcoming opportunities, the interior lighting campaign will begin in March of 2015. And ILC will build on the success of LEEP, and take it in sight. The ILC is designed to help facility owners and managers save energy and money by adopting high efficiency troffer lighting solutions.

So similar to LEEP campaign in design, it's a recognition and guidance program. It's free to join. There is a pretty limited, if any, requirement.

You can join either as a participant or a supporter. And it's decided to help facility owners and managers take advantage of the savings opportunity from high-efficiency lighting solutions, specifically with troffer lighting. The reason for that is that over half of all commercial fluorescent lighting fixtures are recessed troffers, so we decided to focus on that. The opportunity there by adopting the performance levels recommended by the ILC, building owners can save up to 50 percent in their troffer lighting cost.

And, again, even more if controls are incorporated into that. So, again, this is an early warning, but certainly if you keep in touch, there is a contact e-mail there, interior lighting, PNNL dot-gov. Again, you can reach out to myself or Linda also. Coming up, there is a couple activities posted on the BBA calendar. There is a December 4<sup>th</sup> webinar about indoor next generation luminaries, and one on December 11<sup>th</sup>. This will be a technical conference call focused on the specifications that we will designate for the ILC on high efficiency troffers. Again, that is posted on the BBA calendar.

Let's see. Let's go ahead to the next slide. The space conditioning team is led by Dr. Michael Deru. He is based out the National Renewable Energy lab in Golden, Colorado. And the 2014 highlight for space conditioning is definitely ARC, the Advanced Rooftop Unit Campaign – or ARC, as we call it. Rooftop units are of course the HVAC system's use for heating and cooling, to sit on rooftops in many different building types across the country, and is certainly applicable to many facilities in higher education. It's been a great success as well.

Three hundred gigawatt hours annually saves 33 million dollars annually, an incredible amount of money. One drawback to the ARC Campaign, RTUs don't light up, and they're not front and center like lighting. So even though this has been a really effective campaign, it's in fact almost three times as much money and energy as LEEP, it doesn't get as much recognition from the public looking in. So for that reason, a major part of the RTU campaign is that recognition.

You can see we have our website posted there. It's posted off the DOE servers because it's a joint effort. It's not just a DOE effort;

there are many stakeholders involved. The LEEP Campaign is similar. Several publications and new resources came from ARC in 2014, and a full list is provided and easy to locate via the website. You can see that new resources is hyperlinked right there. I'll just mention too that these hyperlinks don't work on the WebEx, but the PDFs of these slides will be available after, and you can click through on all of these so you won't have to go to the Google search.

But the new resources list is pretty compelling. And just yesterday related ARC, we had a webinar, and featured on that webinar was Kurt, who is a facility manager for the Adidas Corporation, and he manages a couple hundred Adidas retail locations. He was doing basically – just gave us a great overview of the processes that the Adidas locations went through, and installing their – updated RTUs.

Kurt gave great color on his own motivation for doing that, for pushing it forward, and shared pretty candidly the challenges and successes that he had working internally at Adidas. So although that is a retail application different from higher education, there is a lot of lessons to be learned there, and a lot of crossovers. He makes a great case, for instance, for replacing rooftop units before they fail.

Generally speaking, that's when you get a new rooftop unit is when your air conditioning goes out in the middle of late July. And he can give you some pretty compelling reasons to do that proactively. So check out that new resources site. There are great case studies on there. We'll go to current activities. ARC continues through 2015, so you can still consider joining. We're gonna announce categories for recognition in January of 2015, so keep an eye out for that.

Two other forthcoming products that will come from the space conditioning team, you can take action by downloading those and reading a best practice for RTUs will help put a dollar figure on a value of addressing those RTUs, again, before they fail, you can figure out how much it would cost to replace them in an emergency. The second resource there is an HVAC system and resource map, and a good primer for anyone looking for an intro, if this is new to you, if you don't specialize in this, you'll want to check that out.

Moving forward to a little bit more, slide 23, please, more info from space conditioning and upcoming opportunities. There is a

pure exchange, at least more to healthcare than higher ed, and two technical guides coming our way that could change the way that HVAC is installed and operated, so pretty important in the world of HVAC. I can say that it will also be pretty complicated. One of them is the optimal air system control sequence. It's of interest to organizations with hundreds of air handling units in a facility or campus, so that could certainly apply to higher education.

And, again, that's gonna be cooked in collaboration with ASHRAE, so it will be written by engineers for engineers. It won't be an easy read. And that's another benefit of being in the space conditioning team, as it will have Dr. Deru to translate that for us and potentially bring in ASHRAE to do a webinar, some other sort of explanatory thing to make that clear to everyone. And then finally at the bottom there, I mentioned the tech demo opportunities before enVerid in A.O. Smith. Those are related to the space conditioning team too.

So we'll go onto the next tech team, slide 24, the labs team. And this team is led by Craig Ray from Lawrence Berkeley National Lab in California. Craig's contact info is at the top. And the thing about energy use in labs is – it's driven almost primarily by ventilation. There is really high outdoor air requirements in labs, so it's mostly outdoor air that is brought in. It has to be heated or cooled depending, so that energy use is always high, compared to, for instance, a typical office building, a lab uses over three times the amount of space.

For that matter, a typical fume hood, which you can see, there is that little picture up at the top right, a fume hood, not just the hood, itself, but the mechanics and operation above it. Just one of those can use the same amount of energy as about three and a half typical residences within the U.S. So in terms of square footage, both nationally and in higher education facilities, the labs may not be the highest, but proportionally, they do use a tremendous amount of energy and for that reason, do deserve special focus, and so that's where the lab team comes in.

2014 highlights. The Best Practice Guide is coming out, and those are forthcoming, so you can take a look at those. And when those are posted, we will certainly promote them. There is also a fume hood study report that is forthcoming very shortly, hopefully before December. And that will go into depth on ventilation as it relates to fume hoods; minimal ventilation rates required for labs in conjunction with thermal loads, basically heating or cooling.

I should also point out the first resource there, navigating building fire codes. This resource is gonna address the myths about fire codes and labs that's often a reason that the ventilation is not addressed. So the resource will provide guidance on optimizing ventilation layouts, what is and what is not stated in the building and fire codes, with a focus on ventilation systems and what comes down to being actual requirements.

What's really excellent about all these resources is that they each include a case study. In the case of fire codes, UC Irvine did a comprehensive study on it, and shared that with us. They are a Better Buildings Challenge member, and we appreciate all their efforts. The labs team has done five webinars this year, building and fire codes, lab ventilation management planning; a great collaboration with CU Boulder on Green Labs' posters, stickers, relating to behavior in labs, and finally a webinar on retrofitting labs.

Current activities. We've identified – in the past, we've worked with I2SL, the International Institute for Sustainable Labs. We've identified a lot of great opportunities to work with them. So moving forward, we do intend to have a more collaborative relationship with that organization, a lot of great crossover in terms of programming, in terms of membership, so that's something that we want to recognize and embrace.

Also we'll give tech support to BBA members through team calls and webinars. That's something that again is not – proportionality, there is not as many labs nationally, so there is an opportunity to give one-on-one tech support more so on the labs team. And then, finally, we will be designing documents for design and retrofit labs. That's important. It's a challenge that labs face, but as of yet, there are no standard guidelines available. So we're gonna determine if there is a need, and what the guide would contain if it were to move forward.

Upcoming opportunities. Send us your stories. We need case studies. We need information to share with other labs and other higher education institutes. In terms of plans for the future, we are looking for an accreditation program for labs that are being retrofitted. So not just the physical build out of a facility, but also how are people getting trained to understand how the facilities work, how they operate, what they'll need moving forward.

So project planning, stakeholder engagement, all the way through to execution. And that certainly relates to workforce development,

which is one of the market solutions teams that we'll discuss in a minute. Finally, we do want to continue to align with the I2SL leadership, as I've mentioned. Let's go to the next team, the plug and process load team. It is led by Rose Langner at the National Renewable Energy Lab in Golden, Colorado. And the plug and process load team's focus, as it was explained to me, is on anything that – well, appropriately, anything that you would plug in a building.

So you can picture that if you were to pick up a building, where you'd have to be a giant in this scenario. So like you're a giant, and you pick up the building, and you shake out everything that's not bolted down. And what comes out is the plug and process load. That's anything that plugs in. So in higher education, that's computers, phones, lamps, things like that. It's a hard number to pin down, but it's an important load to focus on. So the PPL team does that.

2014 highlights completed in plug load study in healthcare focused – worked with Massachusetts General Hospital and Sunny Upstate Medical University to demonstrate saving potential with nighttime idle modes. So this was the vampire loads that that your computers and other plug in devices use. Moving forward, they're going to – they've already developed advanced power strip technical specification, so those are the power strips that you plug in a lot your electronics too, and those are becoming more advanced.

And to anyone who is considering a large-scale purchase of those, this technical document will help. It's pretty quick; it's pretty straightforward. It's about four pages long of material, and it lays out the different attributes that one would seek in a purchase like that. So keep an eye out for that. We can go to the next slide. Current activities. Well, basically, we'll continue to promote the use of advanced power strips, and as part of that, we'll work with building owners and manufacturers to promote incorporating those. We'll also publish a how-to guide for installing them.

NREL and the PPL team will continue to hold project team calls quarterly. I can put a plug in here, the next call is December 3<sup>rd</sup>, so if any of these appeal to your needs right now, please do consider joining us. You can contact myself or Rose's e-mail is listed at the top. That webinar is also featured on the BBA events calendar. Future plans for this team, Rose and her group are redoing their website to make it far more user-friendly for finding resources. So

that will be a great resource for all of us when it comes to locating resources on plug and process loads.

Okay. Let's move to the next team. Energy management information systems. EMIS team led by Dr. Jessica Granderson at Lawrence Berkley National Lab in California. 2014 was a big year for the EMIS team. It was the first year for it, and it was a lot about getting members all on the same page as far as what it means to use energy management information systems. It's sort of the level of the field. It's a new technology. In a lot of cases, it can be daunting and it can be intimidating.

So the point of the programming for 2014 was just sort of introductory. So across the collection of resources, and, again, you can see the hyperlinks there. Those will be available on the PDF, and you can click through them on the EMIS team on the BBA website. The goal is a common frame of understanding. For everyone associated to the extent that's possible. So in addition, the resources were informed by a previous year's summit, the two sessions that we had at the 2013 Better Buildings Summit.

Kristen put a plug in – Kristen mentioned that earlier, so I can just put a plug in for that now. That was the genesis for a lot of these resources. And I think to go through them; I would focus on that crash course webinar. That's a great opener. It's a great starting point for anyone interested in taking a look at an EMIS for their facility. It includes six high-level steps towards establishing a more intentional process for selecting, adopting and implementing an energy management information system, and it takes a look at the broad level cost and savings.

In addition to that starting point, the team put together a list of existing resources, and you can click on that link as well. Again, it's a comprehensive, sort of a clearinghouse for not just BBA or DOE resources, but others as well. Another highlight of this team was actually demonstrating various EMIS systems on team meetings with vendors. So back to that idea that the vendors are a great resource for information, the EMIS team embraced that, and invited those companies to demonstrate their products in an objective environment of those team calls.

The products were selected according to member interests, the ability to be demonstrated in that media and criteria for capabilities included. Last point here on this slide, I'll just point out that the team keeps good track of member participation. All the members of the EMIS tech team are pretty active, and actively looking for

ways to maximize value from the investment that they've made. Some all-stars from that team include the GSA, Whole Foods Markets, the county of Kaua'i in Hawaii, and Wendy's Restaurants.

So we'll go to the next slide, a change to promote an upcoming joint sector webinar with the EMIS team and retail and food services sector on December 9<sup>th</sup>. I would still encourage everyone to attend that. There is a lot of good crossover between sectors when it comes to energy information management, and I think there is gonna be some lessons for everyone to learn on that. In terms of plans for the future, we're gonna move to more specific resources.

Again, if 2014 was about setting a base level of understanding, 2015 is gonna be about driving down to some more nuances of EMIS and how to really advance that. The last featured point there is a product that we intend to produce. We'll focus on incorporating energy data in overall organizational integration. It's no small task, but it's certainly one that can have a profound effect on energy use when that data becomes important to everyone, not just the engineering department or account payable, but is included in the operations of the entire facility, organization, what have you.

Finally, upcoming opportunities. We've discussed at the outset, the opportunity to participate in the Building IQ study, applicable to large indoor spaces, malls, or others in higher education with over 100,000-square feet. Let's go forward to the renewables team. The renewables integration team is led by Jay Paidipati. He is one of our Navigant consultants based out of Boulder, Colorado. The big highlight for 2014 was publishing the commercial solar decision guide. This is a comprehensive guide on purchasing and installing solar on your facility.

In terms of current activities, what we want to do is take that guide and break it into sector specific, sort more useable, a little more punchy, quicker guides. Again, it's comprehensive. I think it's 50-60 pages long, and we want to basically shrink that down and make it a quick reference. Others that may be very interested, other activities of interest to higher education, a leasing guide that addresses split incentives.

And, again, we'll be working with the market solutions team on that. It's really a fascinating problem. It's certainly one that applies to higher education in buildings where you may not be individually metered. You may want to install solar, but your

funding is not based on your rooftop alone, but based on an entire university. It really is a fascinating problem to discuss, and one that we look forward to addressing.

Upcoming for the renewables integration team, we have a meeting on December 2<sup>nd</sup>, and this meeting will feature Andy Walker of National Renewable Energy Lab, and it will be focusing on operations and maintenance of existing solar installation. So that meeting on December 2<sup>nd</sup>, if you have any solar on your campus at your facility that would be most interesting for you to attend. Following that, a great way to get involved with this team, send us some case studies.

We know that higher education is always a leader when it comes to solar installations, and we would appreciate your sharing what you've learned with us, with your peers, and with the rest of the country. In terms of the future, the near term is focused on the solar installation guides, but we do have some flexibility coming up, and I encourage everyone to reach out to us if there is any other aspects of renewable integration that you would like us to cover.

We'll go forward to the next slide there, food service, slide 30. This is led by Dr. Rich Shandross with Navigant. He is based out of Boston. This services technology team, you can imagine primarily focuses on restaurants, quick-serve, full-serve, but also there is definitely a draw for institutional kitchens, such as those at hospitals and universities. I mean certainly some of your universities and higher education facilities have multiple food service operations, and those are great opportunities for energy efficiency.

So you could consider joining along those lines, or considering perhaps management of those individual facilities to joining. The biggest current activity from the food service tech team is the publishing of an EMIS guide. This is a full technical report, again very detailed. And, again, EMIS has a broad crossover. So the lessons learned in food service on EMIS certainly apply to certain aspects of higher ed. as well. It's got a great summary and key takeaways, certainly worth investigating and taking the action to download and read. The hyperlink will work, and you can reach it on the food service technology team website on the BBA website.

In terms of plans for the future, we are gonna break that EMIS guide out into smaller documents, and certainly could have one of those focus on food service in higher ed. if there was demand for that, so please reach out to us if that's the case. With that, I'm

gonna wrap it up. That wraps it up for tech team. So, again, just want to reiterate, there is a tremendous amount of material from these tech teams. It's all available on the website.

The organizers did a pretty admirable job organizing that and making it all findable and useable, so I encourage people to go through all the different accordion dropdowns for that. And with that, I guess I will hand it over to Miss Deb Cloutier to discuss the market teams. Deb, you on?

*Deborah Cloutier:* Thanks Andy. Much appreciated. Can you hear me okay?

*Andrew Mitchell:* Yeah, you sound great.

*Deborah Cloutier:* Okay. Great. So welcome again everybody. Again, let me add my welcomes to you. I would like to share with you some updates on the market solutions team. If we can please forward to the next slide. The ground setting, the goal of the market solutions team is really to help members identify non-technical barriers. So we're sort of the other side of what Andy just updated you on. So non-technical barriers to energy efficiency, and really to identify what are those solutions that then you can deploy across your campuses quickly and add scale.

So, currently, the markets solutions team is organized into four focus areas, and it is based on feedback from members. Some of these I think are more directly useful or related to the higher education sector, but I will go through all four of them for you quickly. The first one starting on the left there is leasing and the split incentives, and that is really seeking to leverage that tenant/landlord relationship to accelerate energy efficiency improvements and lease space.

The second focus group is the finance and appraisal group, and they are focused on building the business case for furthering investment in energy efficiency, as well as helping to ensure that energy performance is incorporated into the building valuation process. The third group is the workforce training, which Andy had mentioned earlier, and that group is helping to ensure that the market has a skilled and qualified workforce that's able to respond to your growing demand for an ability to maximize energy performance.

And, finally, the data access group is working with our members to develop resources and share best practices on how to engage with utilities in order to gain access to energy consumption on a

monthly basis for the purposes of benchmarking. So moving to the next slide, there has been increasing evidence showing the financial benefits of high performing buildings, right, and this is seen not just in these operating costs, but also improved indoor air quality, occupant comfort, extended life of equipment.

Yet, I think too often investments in energy efficiency that has high rates of return had short paybacks are passed over. And so this group is looking at why, what are the misconceptions or perceptions that exist regarding the value of investing energy efficiency, and how that may be preventing organizations from dedicating capital to upgrade. So we're looking to develop a research plan that will grow the body of evidence that demonstrates this linkage between the financial benefits of investments in energy efficiency and the returns or results from them.

DOE is also continuing to enhance the building asset score, so for those of you that may not have heard about this tool before, it uses a 10-point scale to evaluate energy efficiency of commercial, as well as residential buildings, so that would be applicable for dormitories, as well for physical characteristics, and major energy-related systems. So the user enters information about the building structure and energy uses, and generates a score, as well as recommendations for improvements.

And the alliance is looking for seeking out organizations interested in piloting the asset score. So if you would like more information on that, please contact John Jameson, your account manager, and his information will be available in those slides. We're also developing a training course for commercial appraisers, and this is looking to build upon trainings that exist in the market today, but really highlighting how these data tools can help appraisers identify the value in given buildings.

And that will be focused on the energy star portfolio manager tool, as well as the building asset score, and the building performance database. So moving onto the next slide, please. One focus area in particular that I think is maybe a little more applicable to the higher education sector is really this workforce initiative. And it, as I've mentioned before, is looking to develop a skilled, certified, clean energy workforce.

And as many of you may be familiar, there are numerous certifications that already exist in the market today, but they often have varied or disparate requirements associated with them, and

that is resulting in kind of a lack of clear indication of qualified professionals. And so this initiative is working with industry practitioners and the National Institute of Building Sciences, you may be familiar with them as NIBS, to address these barriers by developing voluntary national guidelines. And they will improve the quality and consistency of the commercial buildings workforce credentials for energy-related jobs.

And the program is currently working with stakeholders to develop skill standards, curricula, and training. So stay tuned for more information on that, and if you're interested in getting regular updates on it, we would be delighted to have you participate in the market solutions distribution or e-mail distribution list. So this initiative will likely turn back to the Better Buildings Alliance members, to help drive market demand for these new credentialing guidelines when they are available.

Moving into the next slide, please. The building retuning training was extremely successful as a pilot. It was offered over the past two years. I think over 130 building engineers across six cities. And then the attendees of this training really got hands-on experience in identifying and correcting those operational programs, really the no and low cost measures that can lead to energy waste across the buildings.

And although it was focused on office buildings initially, I think many of the building systems apply in your variety of building types within higher education. And that model was sort of a train-the-trainer approach. And the consortium for building energy innovation in conjunction with the building owners and managers association for those two groups are carrying forward the torch of the retuning training into next year, and they will continue to offer it across the country, and I believe the next one is taking place in San Diego in February of next year.

And the commercial buildings resource database, which is one of the links on the slide, also lists additional building retuning resources, as well as the PNNL, the Pacific Northwest National Labs offers online training at the link that is listed there. So we'd be delighted if you would check out those resources, and also give us feedback if they are being useful in your application. So with that, let's turn to the last slide in my section, please. And this is related to the data access group.

So as we all know the adage, you can't manage what you don't measure, the data access team is working to inform Better

Buildings Alliance members about the array of initiatives aimed at facilitating access to building performance data for the purposes of benchmarking. So this includes working with alliance members to better understand and articulate the critical role that data plays in your energy and management efforts, and helping to communicate these needs to entities such as utilities, cities, and other service providers that may be in a position to help facilitate access to energy data.

One venue in which it will be important for us to communicate these needs is the Energy Data Accelerator. So this is an effort, a partnership, if you will, between utilities, local governments, and the Department of Energy in which cities and utilities pair up together to commit to providing data access to building owners and operators for the purposes of energy benchmarking.

And while much of the accelerator is focused on the topic of whole building aggregated data, which is a challenge that many in the multi-tenant buildings face, the accelerator participants also need to be aware of the data access challenges and needs of the higher education sector, and what specific needs you have within your campuses for their jurisdictions. So as part of the accelerator effort, cities and utilities have agreed to convene stakeholder engagement meetings and discussions around these topics.

And this is an opportunity for the higher education members to participate in your local markets, and to help the cities and utilities understand what data access means in terms of the context of your campuses and your facilities. So the market solution team can also help higher education partners to identify and facilitate opportunities for engagement with the EMIS team, as well as the Wireless Meter Challenge, which are two of things that Andy spoke of earlier today. So with that, I thank you and I turn it back over to Kristen to help wrap us up.

*Kristen Taddonio:* All right. Well, thank you very much. If you could forward to the contact information slide, John, I'd appreciate it. So just to let everybody on the line to know once again, we are here and happy to answer any questions you might have at any time. Feel free to reach out to us at any time. And at this point, we have a couple minutes left for questions. So John, if you want to read up some questions, we'll try and answer these before we wrap up the forum.

*John Jameson:* Sure. And this is also kind of the last chance if you still have any questions lingering, please enter them into the questions pane on the webinar panel. We'll start out here. We've got a few for you,

Andy. First one: Will be interior light campaign be focused only troffer lighting, or will there be other types of indoor lighting included in that?

*Andrew Mitchell:* After some consideration, I should say some substantial consideration. We did decide to focus only on interior troffer lighting. And just by way of explanation, again, that one fixture, and whether that's 1x2, 2x2, 2x4, that's the bulb layout, that one fixture accounts for over 50 percent of commercial lighting. So we decided that that would give us the best bang for our buck in terms of where to focus our efforts. Because if you break out it out all the different options in interior lighting, we thought we would lose some specificity.

*John Jameson:* Okay. Thanks. The second question also related to lighting team: Does the LEEP Campaign, that's Lighting Energy Efficiency and Parking Campaign, focus only on parking lighting, or do they also address campus, road, or pathway lighting?

*Andrew Mitchell:* Yeah, most those things can be relevant. LEEP does focus on lighting in parking lots and parking structures, but I mean when I was in college, a lot of those parking lots were part of the walkway back to the dorm or something like that. So there is some crossover there. There are a couple of other initiatives from the Department of Energy, the high performance outdoor lighting accelerator, and several other in the solid state lighting program. And that's a quick Google search too, or you can link to that on the DOE website.

*John Jameson:* Thanks. And we got one about the renewable integration team: Does the solar decision guide include recommendations for states with both regulated and deregulated markets?

*Andrew Mitchell:* You know, I don't remember off the top of my head. I'd have to open it up. I can it's a very well organized report though. So when that link goes live, or if you want to – whoever asked, just pop on the website and click to it. You'll find that answer real quick in the context.

*John Jameson:* Okay. And then someone was wondering how the can sign up and learn more about the PV operations webinar on December 2<sup>nd</sup>, and was that link included on the slide? Do you know, Andy?

*Andrew Mitchell:* I don't know, but we'll certainly have it added to the BBA events calendar, and they can always reach out to myself or Jay, whose info is on top of that slide. My info is at the end here. Yeah,

definitely reach out to me. We would welcome anyone to join that call.

*John Jameson:* Great. Okay. And then we've got two questions here actually for the markets solutions team, Deb. So first one is what building types are you looking for when piloting the building asset score?

*Deborah Cloutier:* I will defer that one to Kristen, actually, but my understanding is it's all commercial and residential buildings. But Kristen, if I am mistaken on that, please help correct me for Andy if you know.

*John Jameson:* Could you repeat that question, please?

*John Jameson:* Sure. The question was what building types are you looking for when piloting the building asset score?

*Kristen Taddonio:* All right. Got it. We are looking for the traditional combination building type, so office, retail, the only kinds of buildings that we are currently not looking at with the assets score are specifically hospitals and laboratory spaces.

*John Jameson:* Great. Okay. And one more here for market solutions: Who should we contact moving forward about building retuning training opportunities? Would that be BOMA?

*Deborah Cloutier:* So, yes, I believe you can reach out directly to BOMA, and they will be able to provide you information. But should you run into any difficulties, you can feel free to contact me and I will make sure to also share that with you directly. But BOMA has it under their purview right now to be marketing and doing the logistical support for that course coming up in San Diego.

*John Jameson:* Great. That's all I see here in terms of questions, so I'll hand it back over to Kristen to wrap things up.

*Kristen Taddonio:* All right. Well, it is 4:00 exactly, so thank you very much joining us and we hope we hear from you soon. Thank you very much. Bye.

*[End of audio]*