

*Hannah Debelius:* All right, excellent. Thank you all so much for joining. Welcome to the Better Buildings, Better Plants Summit, which is now a virtual leadership symposium. Next slide please. You're in the right place if you are attending the Commercial Real Estate Meet-Up. We are very fortunate to have a large audience today and I'm so excited that this virtual format was able to bring so many new voices. As we just learned in the closing plenary, we think about half of our attendees are new to the Better Buildings Summit, so it's an awesome opportunity for us but we are also so thankful to have our ongoing partners here to join us as well, and we're going to hope to really recreate that engagement that the meet-up usually is and lean into that and make this just a space where we can still have wonderful conversations and hear from other partners.

We're going to do our best to keep it as engaging and exciting as possible, although I don't own a cat so I don't think you can expect any background visitors for me. *[Laughs]* Just a couple of housekeeping items before we get started here. The first is that this meeting is going to be recorded and archived on the Better Buildings Solution Center, so after this we'll reach back out to you all in case you'd like to see it or share with colleagues or that sort of thing after the fact. Secondly, as this is an interactive meet-up you do have the option to share your video or unmute yourself; however, we do ask, of course, that you are courteous and stay muted while you're not speaking just so we can minimize that background noise.

And finally, if you do have any audio or visual issues or tech issues we have someone that is here to help you. If you utilize the Zoom chat function, which is the little speech bubble at the bottom of your screen, you can select to reach out to tech support. So you'll choose tech support from that dropdown and just let them know your issue and we should be able to address it from there. Great. Next slide please.

So I'll be your moderator for today. I'm Hannah Debelius with Department of Energy, and later in the session I'm also going to be turning it over to Deb Cloutier from RE Tech Advisors who will be taking up the moderation from there. Next slide. We have a great agenda for you all today. Of course being a meet-up we're going to start with some program updates and we're going to hear from some of the Better Buildings partners who are going to share a little bit about what they're doing this year. Then we also have a wonderful panel lined up for you all.

That's Audi Banny from the Institute for Market Transportation, we've got Emma Elgqvist from the National Renewable Energy Lab, and then Drew Torbin for Black Bear Energy. So that'll be our panel and then we'll also have some time for Q&A and a couple of closing concluding things. So the first thing I want to do – next slide please – is go ahead and just introduce a little bit of who's on the Better Buildings Commercial Real Estate team. As I mentioned, I'm your moderator, Hannah Debelius, and I also serve as the sector lead for the commercial real estate sector for the Better Buildings Program. And Deb, could you introduce yourself please?

*Deb Cloutier:*

Sure. Thanks, Hannah. Welcome, everybody. As Hannah said I'm Deborah Cloutier. I'm the president and founder of RE Tech Advisors and I'm joining you today from outside of Washington, D.C. As the prime contractor supporting DOE we are coordinating today's summit, so let me add to Hannah's warm, heartfelt welcome. Very excited to be here today.

I serve as a subject matter expert for the commercial real estate sector and have had the pleasure of working with hundreds of the practitioners, many of which are with us today, from all aspects of commercial real estate. It's my eighth CRE meet-up and I am just so pleased to have so many folks with us today in this virtual format. Back to you, Hannah.

*Hannah Debelius:*

Great. Thank you so much, Deb. We're pleased to have you, and we can't see everyone's faces but we know there are a lot of familiar ones out there and it's great to build on the knowledge you have with them. Andrea, could you introduce yourself please?

*Andrea Doukakis:*

Absolutely. Hi. Good morning and good afternoon. My name is Andrea Doukakis and I am part of the Better Buildings Team. I help to manage the CRE sector, so that's why I'm here today. On top of that I also help to manage the healthcare sector as well as being part of the waste pilot team that we're going to mention briefly in a few moments. I'm looking forward to today's session. Enjoy.

*Hannah Debelius:*

Great. Thank you so much, Andrea. And Mike, you're also our tech support today, which is why that's on your screen, but if you could introduce yourself that'd be great.

*Michael Powers:*

Yeah, sure. Thanks, Hannah. Hi, everybody. My name is Mike Powers. I also work for RE Tech Advisors and I also help support the CRE sector and also our market solutions work. So I'm really

excited to be here. This is my first CRE meet-up and, yeah, looking forward to our presentation today. Thanks for being here.

*Hannah Debelius:* Great. Thank you so much, Mike. Next slide. So for those of you that might've attended the opening plenary before this, this is a tool you could be familiar with, but basically we're using this tool today called Slido in order to really increase that virtual engagement. So this will be the same platform where you can submit questions for our panelists and also we'll be doing a couple of polls throughout this to get feedback from you all and also just to learn about who's on the line. So what you want to do is right now you can open up another browser window or you can use your mobile device to go to Slido.com.

You're going to enter the code #bbsummit and then from a dropdown list you'll choose CRE meet-up. So again, you open up another browser or your mobile device, go to Slido.com, the event code is #bbsummit, and then you select CRE meet-up from the dropdown. And you'll be able to actually toggle in between the polls that we put up when we launch them and also submitting those questions for all of our panelists today. So those questions are live now and, yeah, if you could take a moment to just open that up it'll make everything run very smoothly. And if you have any problems, again, you can Zoom chat to tech support.

Great. So another way that you can engage with us throughout the entire summit this week – you can go to the next slide please – is on social media. Of course on Twitter we are @BetterBldgsDOE and also @BetterPlantsDOE, and we'll be continuing the conversation there and, you know, sharing some of the resources that we're talking about in all these different sessions, so a great place to check out for the whole week that we're doing this. Wonderful. So we're going to go ahead and get into one of these Slido polls.

So if you could go ahead and launch that poll that'd be wonderful. This is our first poll where we're just going to learn a little bit more about you all and what's on your mind, and it is something that we're going to leave open for a couple of minutes so that you have time to really answer this. So this poll's going to be a word cloud, and if you could just tell us in one to three words your most interesting ESG project that you're working on right now. So I know that there are a lot of competing priorities right now with buildings and the workplace, and if that's what's on your mind please share that, but we're also just interested in hearing about the projects that you have looking at the whole next year or two years,

what's on your mind, and we're going to use this information to help guide and dictate what we do in the next year as well.

So we're going to go ahead and leave that open and I'm going to jump to just a couple of other slides so that we really get time to build that knowledge. Excellent. So I would love to welcome some of our new partners this year, American Family Insurance and Hudson Pacific both joined us for the Better Buildings Alliance, and Hawaiian Airlines, Highwoods Properties and Kilroy Realty have all joined the challenge levels. They've made a tangible commitment to energy efficiency.

Hawaiian Airlines, in fact, is our first airline onboard, so we're pleased to have them, and Highwoods and Kilroy are really building on, you know, longstanding commitments to corporate sustainability and responsibility through this efficiency commitment. So we are thrilled to have them all on board and to continue the conversation. And if you're new to the program you also can go to Better Buildings Initiative online and that's where you can find out more about these or reach out to myself and Andrea and Mike as well, because we would love to have you on board and in the group.

To continue on with some of the things that we've been up to this year, in addition to welcoming these new partners – can I get the next slide please? – I also had the very fortunate opportunity to visit one of our – do a site visit with one of our showcase projects. Jim Landau of MetLife Investment Management welcomed myself and also the director of the Building Technologies Office, David Nemtsov, to their district center, which is a commercial real estate building actually here in downtown D.C., and it's also the first of its kind for a smart commercial office building with lots of really awesome tools for tenants to utilize the building well and prove their experience and also improve energy efficiency. So this showcase project in particular was actually able to cut costs in energy by about one-third, and you can learn more about that visit and also that showcase project on the Better Buildings Solution Center.

So thanks again, Jim, for having us this year. It was a real highlight for me. So really though I'm very excited to congratulate two of our partners this year in achieving those energy commitments. Both of these partners, Nuveen and USAA, have been in this commitment for an entire decade and have reached this goal, so it's a huge deal. We've been so glad to have them on board.

With Nuveen, we've had the opportunity to work with Jessica Long and Brittany Ryan, and over at USAA we've worked with Jason McIntyre and Damon Skelly, so it's been such a wonderful buildup to these commitments over the last 10 years and, you know, such an institutional commitment for these organizations that we're so glad to see to fruition. So Andrea, if you could go ahead and launch, we're going to show a little video that highlights some of their milestones along the way and just a little bit more about what a great achievement this is.

*[Video plays from 0:10:30 to 0:11:56]*

Excellent. Thank you so much and congratulations again to those two partners and goal-achievers. It's really exciting. And if you want to know more about their energy journeys you can pop over to the Solutions Center and you can see their data on their profile as well as all of the many solutions that they've contributed over their 10-year commitment with us. So, congratulations to you both.

So next I do want to talk a little bit just about the priorities we've tackled for this year. So for those of you that are new, every year we set a couple of priorities for the sector and we work with our steering committee and also with partners to set these and really try to understand what goals for the industry might be for the year and react to those. So our first priority this year was to really continue and evolve the work in resilience that you all have been doing and we've been doing at DOE and make a little bit more connections and, you know, provide some guidance and analysis in the resilience space. So I'm really excited to say that we're actively working on a *[audio cuts out]*, but additionally we are actually actively looking for more examples for how, you know, commercial real estate has really worked with the public sector as well.

So if you're an example of having this public-private partnership, we really want to hear from you and learn a little bit more, so you can reach out to myself, as I mentioned, or Andrea or Mike with that information. Our next priority was something that was suggested to us by our steering committee, and it was to create a sort of resource that could speak to those organizations beginning their energy efficiency journey. So with that we've created a new tool that really distills some of the solutions that we had in the solution center down to these kind of fundamentals and foundations of energy efficiency, so that's up right now and I'm also pleased to say that we'll also be highlighting a resource from ULI in the next couple of weeks that they're working in this same

space, so keep an eye on that resource as we continue to build it out.

As someone on our steering committee said to me – actually, I think it was Sarah Neff from Kilroy – but she mentioned that basically it's always a good time to go back to those fundamentals, so it's always a good thing to check out whether you're at the beginning or you're a leader in your energy journey. Finally, for a third priority it was really to make closer connections with all of the technology the Department of Energy leads with our laboratories and with our tech teams. So hopefully you've noticed we've been making more of these connections particularly over email, but in addition to that we've worked closely with the Energy Management Information Systems tech team, and they are concluding the fourth and final year of the Smart Energy Analytics Campaign, so you can expect to see more results coming from that as well as closer integration with our integrated lighting campaign.

So we're always looking for feedback about what to concentrate on though in the next coming year, so if you have that you can reach out any time to us and we'd love to hear about it. Great. Next slide please. And actually, for our next slide we're going to be going back to that word cloud that we started just a couple of minutes ago to see some of your responses. And again, this question was what is the most interesting ESG project that you're working on right now? All right, great. I'm seeing a lot of solar, *[laughs]* which is wonderful.

I know we're exploring renewable energy today during our panel, so that's great to hear. Of course, energy efficiency, climate risk and resilience. That's wonderful since that's already one of our priorities. Sustainable landscaping. That's very interesting. Yeah, and green autonomous buildings. A lot of smart building work.

All right. Wonderful. Well thank you so much for all of your input on that, and I think we can go ahead and launch our second poll as well. Great. We're going to have one second, but for the second poll what we're interested in assessing is that if DOE were to put together a Better Building Resource – or sorry, excuse me – what Better Building resource do you find most valuable that we create? Okay, great. I'm seeing a lot for webinars, a lot of in-person networking sessions, which hopefully we'll get back to soon.

Case studies, tool kits. Wonderful. All of these things we can find on the Solution Center, but I know that direct links are also helpful. Wonderful. And a great showing for webinars, which I know what

we're all getting very used to and I think that that's great because it means that we're evolving and adapting to making the most valuable resources we can. Excellent. I think that looks pretty good. And I believe there is a second part to this poll, Andrea, if you could launch that.

*Andrea Doukakis:* No, this is the whole thing, Hannah.

*Hannah Debelius:* Oh, great. I must be thinking of the poll that Deb was going to talk about, so stay on the edge of your seats for that one. *[Laughs]* And as a reminder, at any time you also can toggle back over to that Q&A tab where you can submit questions for all of the panelists as well. Great. Well, the last thing I want to talk about before I turn it over to Deb is also the waste reduction pilot, so if you could pop back over to those slides, Andrea, that'd be great.

For the waste reduction pilot, you all might remember that we actually announced this at last year's summit. So we're a full year into this pilot program which engages 30 partners across many sectors in their waste reduction efforts and also *[audio cuts out]* and they're already contributing so much to this body of knowledge. In fact, Shorenstein has gone ahead and they have been our first commercial real estate partner to produce a solution at a glance in our Solution Center about their engagement around waste efforts. Bill Whitfield, in fact, is actually going to be speaking on a session that we have on Thursday.

It's Thursday at 11:00 AM, where we're going to be debuting these early results from the waste pilot. We are recording these sessions so you can always access that after the fact as well. Although Tower Companies may or may not be talking about their waste in the closing plenary, I'll also just plug that Jonathan Bauer of Tower Companies is joining for our closing plenary, where they'll be speaking about a variety of energy efficiency efforts and health as well. So I hope that you tune into that. And yeah, with that, Deb, I'm going to turn it over to you so you can talk about some of our partners.

*Deb Cloutier:* Great. Thanks so much, Hannah. I really appreciate it. So let's turn now to a few of our commercial real estate members to share updates on projects they've been working on. Many are related to those three priorities that Hannah just talked about. First off, I'd like to ask Zach Brown and Rielle Green from DWS to share a little bit more about your recent projects on climate risk and resiliency. Zach, are you there?

*Zach Brown:* I'm here. I'm going to turn it over to Rielle.

*Rielle Green:* Hi, everyone. I'm Rielle Green, sustainability manager with CBRE. However, I'm fully dedicated to the DWS portfolio in the Americas, and DWS is a real estate investment business that includes \$55.6 billion in assets under management across the globe. Our team works on everything under the ESG and sustainability umbrella in the US from GRESB for our funds to project strategy implementation across 300 buildings. And as you guys said, we're going to give you an update on our climate risk and resiliency program, which last year we presented on our pilot at this meet-up as well as one of the sessions under the resiliency track.

And our pilot, it focused on climate risk from hurricane and flood at an asset in Boston on the Fan Pier, and since then we've increased our program to more sites along the East Coast and begun to expand risk beyond sea level rise, hurricane and flood to assets on the West Coast that are prone to wildfire and air quality risks. So no longer a pilot; we have really established a DWS-wide portfolio procedure through our site-level risk and resiliency checklist, and this looks at assets from all types of risks from climate change and identifies strategies and improvements that would protect occupants as well as interior systems, equipment and the physical asset. From there we do want to highlight that we work with a dedicated consultant to further review individual assets in our sites, and our consultant really works to help us procure and analyze predictive models and together we devise long-term considerations into a climate plan which looks at the whole life cycle of that asset.

And this plan identifies that climate risk through emergency procedures for tenants and residents at our assets throughout the states as well as the protection of critical equipment and asset infrastructure. So we wanted to share a couple challenges, one that I think you know has come up and that predates COVID, which is working with cities, including the city of Fort Lauderdale has really been a challenge for us. Getting responses back from the city and working on kind of collaborative solutions is something that we're hoping to strive to break some barriers there but are still waiting on some responses. And then another challenge that we wanted to highlight as well as been finding vendors to do the work at the site level. So this has been a huge obstacle during the past couple months when we've been facing COVID-19, and one thing, you know, our site teams, so our property managers and engineers at the sites have been seeking a lot of bids with our vendors.



So seeking bids when vendors can't come to the site has definitely been a challenge as they've been really estimated at high prices, so one thing we're keeping in mind that it is hurricane season and we need to be protecting our assets, but of course we are in the middle of a pandemic so there's some challenges there. We are really happy to share that we are working with the BBC team on an implementation model around our site-level climate risk and resiliency checklists where we outline our process, our challenges, our solutions and our outcomes so far, and we are hoping this will be a helpful resource for those of you who have not started on this process yet or a nod to those who have already begun to develop these for their clients or for their companies. So we're hoping this will be published in the next couple of weeks, so stay tuned. And that's my update. Thank you.

*Deb Cloutier:*

Thanks so much, Rielle. Really appreciate your willingness to share not only about the process you've been undergoing but also the challenges. Many other real estate owners and operators are wrestling with climate risk assessments and how to define the materiality of those risks, so we're really looking forward to the development of the implementation model. Next up is our dear friend Marta Schantz with the Urban Land Institute. Welcome, Marta. It's so nice to have you back from maternity leave, and we are delighted you can join us today. Can you share with us some of the new resources ULI has been working on?

*Marta Schantz:*

Absolutely. So thanks, Deb. Thanks, everyone. For those who aren't familiar with ULI, just real quickly so it's not too confusing, we are not a real estate owner but we are very much involved in the real estate community as an industry group across the globe for real estate members looking with the mission and vision of developing and sustaining thriving communities with regards to the responsible use of land. So our Greenprint Center looks at everything related to the business case for green buildings, looking at reducing carbon emissions and tying that to increased asset value. We have a number of real estate members who engage at a very deep level, and then we go more broadly with all of the real estate community and all of our members across the globe to make that business case.

And so over the past few months, partly while I was on maternity leave and partly before and after, we've put out a number of resources that we're very excited to share with you all, hopefully that are useful to your own efforts. The first one for me to mention is one on embodied carbon in building materials. So a lot of times

and for the longest time we've been focusing on the operational carbon emissions of a building. Once the building is created that's the emissions that we have control over, but on the development side when we think about the building materials all of the carbon that was put into the creation and the construction and the transportation of those materials before it even was constructed on site is significant.

As buildings become more efficient in their operations, embodied carbon can be 50 percent or more of total carbon tied to that asset. So we put together a resource looking at how the real estate community can reduce embodied carbon in their developments with a nice flowchart and some examples of real estate leaders who are doing good work on that. So please take a look. There's information, everything ranging from how to calculate embodied carbon emissions to different materials to use, like across laminated timber, and how folks are making the business case when there isn't really a price on carbon yet in the market. The next one on the list here is about class B and C office energy efficiency.

We've partnered with BOMA in the Rocky Mountain Institute to look at specifically the class B and C market because those buildings are pretty constrained when it comes to staff time, funding, and just overall knowledge of opportunities in the market. So we wanted to have a resource specifically targeting that sector and we ended up with a handful of great recommendations and case studies looking at no and low cost opportunities that are very much approachable and reasonable for that class B and C office market on energy efficiency technology and operations and also on the green leasing side. Because as we all know you can't really make as much progress as you want on sustainability and energy efficiency without having tenants on board. So we're very excited about that report and it's got some strong resources in there for folks to leverage.

And then the last one on the slide here, and I've got a few more that I'm going to mention to you because I'm excited, but the last one on the slide here is about a net zero tenant case study. So the Rocky Mountain Institute is a company based out in Boulder, Colorado and the office there at least is net zero. The awesome thing in my mind is that it's in a net zero building. It's a multitenant net zero building and that's just unheard of until now, and so we were able to put together a case study about how that process that the Rocky Mountain Institute as the tenant in this multitenant building was able to work with the landlord developer to reach that

net zero goal both on the construction side and kind of planning for their own tenant space and then also looking at operations and ongoing efficiency with plug load thresholds, data transparency communication, renewable energy considerations, the whole gamut.

So we have a very multi case study on that and it goes deep into the weeds in terms of energy conservation measures, calculations on savings and costs compared to code and really full details on how that all came together. So we see that as a good benchmark for future multitenant office buildings to go after net zero and achieve those savings. And then even more recently we put out a report called *Decarbonizing the Built Environment: 10 Principles for Climate Mitigation Policies*, and this is the culmination of three different workshops that pulled together city and real estate leaders, looking at how local climate policy is being made and developed and how it impacts the real estate market. And ultimately we're recommending these 10 different principles as drivers for resulting in positive climate policy that's beneficial both for the real estate market and for the city that has set such generally aggressive climate goals, all about having partnerships and collaboration, ongoing communications and involvement between the local city and real estate leaders to achieve that success.

So any of those resources, if you want to learn more we've got links here, and if you just want to talk more about how to incorporate them within your own portfolio just reach out to myself or other folks at ULI and we'd be happy to talk more. A quick teaser for two upcoming documents, if you'll let me, Deb.

*Deb Cloutier:*

Just quickly.

*Marta Schantz:*

Very quickly. The first is a blueprint for green real estate. We're working to put together a very almost, like, book on how real estate leaders can incorporate energy efficiency and sustainability writ large as a strategy for their organization, and so that's coming together really well. It'll be published in the fall and we'll be referencing a lot of Better Buildings resources as well, like the financial navigator and a number of implementation models. And then we're also putting together a resource on health and social equity in real estate that'll be coming out this fall as well, looking at the business case for drivers and the value behind health and social equity as part of your ESG strategy with dozens of examples of companies who have done this and are trying to look at metrics

and ways to measure their success. So a lot going on and we're excited to share it all.

*Deb Cloutier:*

Thank you so much, Marta. These are the kind of cutting-edge resources that are really helping the practitioners, so thank you and ULI for making them available in the market. Next up is Matt Praske with WashREIT, a hometown ESG leader. Matt, can you share with us a little bit about your recent efforts to tackle energy projects with a portfolio-wide approach?

*Matthew Praske:*

Sure. Afternoon, everyone. So first of all I'm feeling even more inspired to meet our Better Buildings challenge goal knowing that I'm looking forward to getting a slick video like Nuveen and USAA when we reach our goal. So I'll just highlight one of our recent efforts. We've been looking for opportunities to spur more action across our portfolio all at one time. So a little over a year ago we knew we were planning to do a full energy audit at one of our buildings that was undergoing some more substantial base building HVAC renovations, and so in doing that we tacked on about two additional days of work to our consultant who was doing that work, and we said, "Look, we don't need a full audit but will you do an energy assessment or a quick walkthrough across 11 other properties?"

So for sort of incremental additional time and money we were able to get a good result of a full report for one property, and we said we don't need a full report for these other properties, we just need some ideas, some energy savings opportunities. So that was really successful. We got the result we needed where we got the attention of our property teams in a short turnaround and we got a great list of potential opportunities to go tackle. What we're finding is that implementing those measures across the portfolio is presenting a little bit more of a challenge. We're having a mixed bag of results. So we've tried to break down the measures that were identified into the different lifecycle events.

We said, "Okay, here are the bucket of measures that can be implemented immediately during routine maintenance throughout the building, here are others that can be done when units turn over, here are others then that are more substantial and need to wait till these units are undergoing major retrofit or other capex planning is going on." So we've had some success across some of these, but the ability to tackle – I think we found it successful that we were able to identify opportunities across a portfolio, but getting the implementation portfolio-wide is something that we still have to work out and figure out what those barriers are for us, so that's one

of the things that's on my mind this week, looking to learn from other partners during the summit if some others have sort of already solved those challenges and we can learn from them. So that's what's going on with us.

*Deb Cloutier:*

Thanks so much, Matt. Really appreciate your willingness to share. I know many of the folks in our session today face similar challenges when trying to do a portfolio-wide approach or focusing on the big loss with the highest return on investment for an organization, so really appreciate that. Thank you. Okay, so next up we're going to do another poll. We're running just about 5 to 10 minutes behind our schedule, so just a verbal cue for our upcoming presenters to try and work through things quickly.

As a reminder, utilize Slido for all of the poll responses and to submit questions. So many partners have shared with us a growing focus on clean energy, carbon reduction and net zero. You've heard that throughout some of the comments already today. If DOE was to develop a roadmap on these topics what should we include in it? Help us to understand what would be most helpful to you and your organization. So if you can, let's go ahead and start to submit answers to that poll please and we will see our results coming in.

Scope 3 emissions. Boy, that is a real hairy one for commercial real estate, isn't it? And cost of implementation, attributes of good candidate buildings vetting. Right? That prioritization segmentation of analysis is an issue for many of us as well as options for relatively low cost RECs and offsets. Timelines, so how are others doing this, how aggressively are they moving. These are all really great responses here. We'll give it another minute or two.

Universal definition. Well that would be nice. We're not quite there yet. The economics and the business case, always trying to help to clarify that or define it based on what the partners are doing. Electrification, a confusing topic for many. I think many of us are still trying to learn about this and what it might mean for commercial real estate and the cost effectiveness of electrification strategies. So these are all really helpful.

The co-benefits like Joe Allen talked about. Agreed. I took notes during this presentation a little while ago and thought we need to be running that kind of analysis for many of the portfolios we work with. Okay, great. So this is helpful. We will take all of these answers after the summit and start to work these into the rules and materials that we're developing.

So let's go next – I would like to introduce our three panelists that we have, Audi Banny, with the Institute for Market Transformation, Emma Elgqvist from the National Renewable Energy Laboratory, and Drew Torbin with Black Bear Energy. So just a reminder to continue to use the Slido platform to submit speaker questions. While they're talking I'll be curating your questions and teeing them up for our Q&A that's going to happen at the end of the presentations. So with that, it is my sincere pleasure to introduce our first presenter, Audi Banny.

Audi joins us from Washington, D.C. She is with our friends at the Institute for Market Transformation as an associate director for private sector engagement. She leads IMT's work with the real estate decision-makers to drive adoption of innovative solutions that bolster landlord-tenant relationships including green leasing, which Maria talked about earlier in the plenary this morning. So with that, Audi, take it away and let's hear about what IMT has been up to.

*Audi Banny:*

Great. Thank you so much, and I'll do my best to stay within the timeframe. Next slide please. So as you heard from Deb I work for the Institute for Market Transformation and, you know, today and well into the future there are considerable uncertainties around the extent of future climate change and how the expected path of GHG emissions will impact our physical, biological and economic stability. Over the next eight to ten minutes or so I'm going to share with you some challenges and some changes in policy that will impact your assets, what IMT is doing to support your needs, share some strategies that can drive a widespread demand for high-performing buildings and how your feedback will inform this work. Next slide.

As cities seek to reduce carbon emissions they're doing so by passing policies that guide building owners toward enacting efficient improvements in buildings, policies like benchmarking, auditing, building labeling, and the most recent building performance standards, also referred to as BPS, have been passed by four jurisdictions and are being closely viewed by other cities following down the same path. Why is this really a big deal? It's a big deal to you because building performance standards are mandates that require building energy performance to improve over time. These policies are enforced by fines or penalties for noncompliance, and for BPS to succeed in driving down carbon communities across the United States, not only do cities and states need to invest in more financial and political resources but

landlords and tenants will ultimately have to work better together to comply with these new mandates, avoid hefty penalties, reap the reward the energy savings and address climate issues we face today. Next slide.

At IMT we believe that the future versions of BPS can optimize not only for energy and carbon but for affordability, inclusiveness and equity, grid flexibility, reliability and resiliency. Many of these goals are shared by cities, building owners and even some tenants. It's now important than ever for these parties to come together, find innovative solutions that are equitable and meaningful to the communities where they reside. Next slide. And so for example, last year New York City passed local law 97, which requires the building owners to reduce carbon emissions 80 percent by 2050.

As I mentioned earlier, BPS is really a disruption to how landlords and tenants must work together in order to comply with these new mandates, and in New York City IMT collaborated with the mayor's office of sustainability and other to host a workshop which invited sectors involved in the leasing transaction and operations of those buildings. Those included tenants, owners, operators, trade associations and nonprofits to explore the current hurdles inhibiting owners and tenants from complying in New York City. Next slide. Generally the hurdles fell into seven different types, starting with the lease negotiations, with which the speed they're executed paid really little attention to large-scale carbon savings opportunities, the misconception that one side or the other is unwilling to discuss energy efficiency before the lease is signed, dealing with conversations that must expand beyond the leasing folks and include sustainability, energy managers, engineers and anyone else that could provide guidance up front before the lease is signed to ensure that not only the tenant space is efficient but it contributes to the whole building performance.

There was much conversation about density and tenants that incorporated that into their space. Unfortunately, I think for now and into the foreseeable future I think density may go away when it comes to designing tenant spaces. And then the last one we talked about was alternative financing, which generally is overlooked. Next slide. So BPS has been passed by four jurisdictions. We've got New York City, Washington, D.C., Washington State and St. Louis. I'm not going to go into that much detail on this slide, but generally the policies vary by city; most notably by how performance is measured.

New York City measures by carbon while D.C. has chosen Energy Star score and St. Louis evaluates building performance by site EUI. D.C. will set their Energy Star score by January of next year and St. Louis will follow with their site EUI by May of next year. To learn more about all of these policies and download resources geared for the whole government, building owners and tenants, I highly recommend you visit [IMT.org/BPS](http://IMT.org/BPS). Next slide. So the question is can building performance standards positively disrupt leasing transactions? It really should.

What we're finding is that IMT speaking with building owners that have started to address how they get tenants on board with efficiency are really better positioned to address these building performance standards. Awareness really is key, and when this information is shared before lease negotiations begin tenants can make informed decisions that contribute to improving building energy performance, but it can really also lay down the groundwork for productive ongoing communications with tenants on efficiency and other priorities through the duration of the lease. Next slide. On the ground, in D.C. the Institute for Market Transformation, under the leadership of Mayor Muriel Bowser, is leading a development of what's called a hub, which will launch later on this year, hopefully in the fall.

The hub will provide the right type of technical solutions, a place to foster collaboration, innovation, and the capacity to provide training to help D.C. owners and tenants integrate sustained efficiency solutions in buildings to cut the district's greenhouse gas emissions by almost 1 million tons a year. Next slide. And because of many factors, including COVID, the leasing transaction between landlord and tenant really must change, but with so many different types of owners and tenants and their needs, and then you fold in new building performance policies this really can be challenging. That is why IMT is here for you and we'll continue to explore solutions that enable owners and tenants to work better together, and we'll be doing that by developing training resources and empowering those that guide you and your tenants, consultants and architects the knowledge and the tools they need to ensure these solutions are implemented throughout the lifecycle of the lease.

This work is going to encompass leasing practices, lease language, how they integrate into lease negotiations, resources and customized training for training consultants and that influence decision-makers, and not just develop resources but we really hope that our work could be implemented on various levels, so we're going to be working with local and national trade associations to



integrate training that meet their member needs and are easy to employ. And with this work we really hope to provide guidance for all of those involved in the leasing transaction. Next slide. Okay, so before I get to the polling question, IMT really is an advocate for transformative change, and sometimes change can be uncomfortable. Part of our work is to help cities, owners and tenants through the changes by working with policymakers and others to provide the support needed for widescale change.

The question below – can you pull up the question for me please? – will help inform how IMT can best support you and how cities can approach the development of building performance policies. Okay. This is great. Okay, this is very, very helpful. Thank you. Just give it one more minute or so. All right. Thank you.

You can go to the next slide. So this is just really to represent that 2030 is right around the corner and building performance policies are looking at the next 10 years as a time to make real impact in driving down carbon in cities, and depending on how well your asset is performing you will likely only have maybe one to two leasing cycles to integrate efficiency with your tenants. And I'm definitely not excluding mid-lease opportunities, but that's not necessarily the time for big investments in efficiency. Last slide.

Great news is that there are many, many resources which were also mentioned earlier, and IMT is here for you and here to help. So we can certainly provide assistance in helping greening your lease, guide you through recognition under the Green Lease Leaders program and with strategies that engage tenants on efficiency through our landlord-tenant energy partnership program. I strongly recommend you visit our library at [IMT.org](http://IMT.org), or you can contact me directly. And if you missed the announcement today recognizing 2020's Green Lease Leaders, you can visit [GreenLeaseLeaders.com](http://GreenLeaseLeaders.com) to learn more. And with that I thank you.

*Deb Cloutier:*

Thanks, Audi. Really appreciate it. It's terrific to see the adoption and the early successes of green leasing. Many of those leaders are in our session today, so we say thank you and a huge shout out to all of the Green Lease Leaders that were recognized earlier today. There is still so much work to be done though to improve the efficiency, the health and the wellness of our commercial real estate buildings and we highly encourage everyone to check out the high performance building hub that Audi talked about that IMT is developing. They continue to collaborate and to implement these strategies that will not only help modernize and advance our

building stuff but really help all of us to be more efficient, resilient, and avoid building obsolescence.

So now we welcome Emma Elqvist from the National Renewable Energy Laboratory. Emma is an engineer at NREL in Golden, Colorado. Welcome, Emma. Emma's work includes providing technical assistance and deployment guidance on distributed energy technologies, conducting renewable energy screenings, evaluating renewable energy and storage deployment potential and resiliency benefits of integrating renewables into microgrids. So Emma, let's hear about the latest advancements from our National Lab on EV deployment and distributed energy resources.

*Emma Elqvist:*

Thanks, Deb. You can go to the next slide. So as Deb mentioned a lot of the work that I do at the lab and the group that I work in focus on technoeconomic optimization and modeling of distributed energy resources like solar PV and storage, but what I'm going to talk about today – you can go to the next slide – is considerations for EV deployment as it relates to other distributed energy technologies as well as technoeconomic considerations of those. I'll start with just a little bit of the background of the tool we use to inform this modeling effort and specifically how we adopted it to account for EVs and then share the results from a key study we did at a workplace in Minnesota.

If I have time at the end I also have a couple of additional slides on related efforts, and I'll start my time here to make sure I stay on track. You can go to the next slide please. So in considering distributed energy technologies for a given location there's a lot of different factors to consider, including the renewable energy resources that are available, the technology costs and incentives that may be available locally to help reduce those, any resilience goals that the site has, your utility cost and consumption, kind of what these technologies are competing with, and financial parameters. And all these factors need to be considered kind of within one problem statement rather than just be considered on an individual basis.

So if you go to the next slide please the way we do this at the lab and the group I work in is through a model, an energy planning model called REopt that considers all of these inputs concurrently. I'll speak just a little bit about how the tool works. So at the bottom, the starting point of this tool is oftentimes the load or the energy requirements at a given site. So on an hourly basis typically we'll look at what the electric loads are broken down by vehicles as well as building loads, any thermal loads that are there, and then

we can also look at water demand. And then so that load must be met in the model by some combination of technologies that are listed on the left here.

That includes the electric grid or conventional backup generation, renewable energy resources like solar PV, wind and biomass, energy storage and then dispatchable loads. And so electric vehicles kind of fits into both of those. It can be just a static demand at a site that has to be met or you can think of it as a dispatchable technology that has some kind of energy requirement over a time period, but that can be managed in how and when it's being drawn from the grid or other technologies. And so then what impacts this set of technologies that's most optimal at a given site is the energy costs and potential revenue to an existing location.

So kind of the rate structure that a given site subscribes to, any market participation, kind of additional revenues, and then we look at how those change over an analysis period, typically 20 or 25 years. Like I mentioned, technology costs, incentive and other financing parameters, and then the goals at a given site. And what the tool provides is then a solution that includes mixes and sizes of various technologies, how those should be operated, and then the economics associated. You can go to the next slide please. So this slide here shows an example of a week where the models meeting the load at this particular site – it's the thin black line across the top here – by combination of the utility green and gray, PV serving that load in blue, and energy storage charging and discharging throughout the day.

So the PV alone is able to reduce here or offset a lot of the energy consumption at the site as shown by the area under this curve, but the peak demand, the kind of maximum draw from the utility at any given time is not significantly reduced by the contribution of the PV system, and so here's where the energy storage comes in. It's being charged in the early morning hours and then discharged late in the afternoon when the solar generation is starting to decrease but there's still a significant demand at the site, and so by doing so and discharging the battery for just a couple of hours throughout the afternoon the site here is able to reduce demand from about 27 megawatts down to about 22 megawatts. You can then see later in the day on a Thursday here the demand at the site isn't quite as high as earlier in the week but the battery storage system here is being used to do some energy arbitrage, so charging at a cheaper time of use electricity rate and discharging at a higher rate.

And so REopt considers the tradeoff between the investment costs of these technologies and the sizes to determine the optimal size and dispatch of various technologies. You can go to the next slide please. So probably two years ago now we started thinking about how we can incorporate electric vehicles into this framework, and so we've done that in two different ways, and the big thing that we're concerned with here – the rest of the framework is in place basically, but the addition here is just considering the load of an electric vehicle in addition to the load from, say, a commercial building. So we approached it two different ways.

In the first way here we are modeling what we call a static load. So we're utilizing a database at NREL called EVI-Pro to sample into events of vehicles arriving at a workplace, and so the information we're using here is the arrival time and then there is an energy requirement associated with each vehicle, so that changes kind of by vehicle and by day. And we assume that the EVs arrive at a workplace, they plug in and they charge at the maximum rate of capacity until the battery is full or until that energy requirement is met. And so the chart on the left here shows the stacked load profile or energy requirement from six chargers during a week in January, so you can see there's some kind of very peaky event which is just several vehicles arriving around the same time and plugging in and charging.

The chart on the right, it's a little bit hard to tell but we just overlaid that with a typical commercial building – I believe that's a medium office – and so while it's not contributing a lot to the total load, if you kind of zoom in and look at the spikes it's adding to the demand, the kind of maximum demand at this building profile. So even this small amount of additional energy can add significant kind of peak demand here. You can go to the next slide please. So the second way we approached it in this modeling environment was to think of it a little bit more as a dispatchable or a flexible load with some parameters, and so here what we're passing along to the model is the vehicle's arrival time and departure time and then the total energy requirement that needs to be met within that timeframe.

So oftentimes there's a lot more hours throughout the day where the vehicle could be charged, but if you just plug in as soon as you arrive you're not really taking advantage of that, and so we wanted to explore what some of the benefits were associated with shifting some of that energy consumption around. You can go to the next slide please. So I'll go through our results from an analysis we did through the – for an EV workplace charging in Minnesota. The full

kind of set of slides and analysis can be found using this link here. You can go to the next slide please.

So again, we're using the REopt modeling platform here to evaluate the economics of workplace EV charging in Minneapolis, Minnesota. We're utilizing the EVI-Pro database to generate these flexible and static loads and we're evaluating the savings from adding PV and storage with the added EV loads at a commercial building. So you can go to the next slide please. All right. So here we're looking at the results from our first scenario, which is just allowing the model to add solar PV and battery storage – stationary storage, I should say – to help offset the costs of the EV charging electricity consumption.

So in the first column here of the results is kind of the base case, so here we're looking at the utility costs over a 25-year analysis period of adding the EV chargers. I see a question in the chat here, if it's level two – it is, yes. And so you can see here on an annual basis this adds about 17,000 kilowatt hours in electricity purchases, and so what that means under this rate structure we're looking at here is about \$1,000 a year in energy charges but over \$4,000 a year in demand charges. So over the 25-year analysis period that's \$140,000 in electricity costs.

Next we're letting the model size a PV and stationary storage system to help offset these costs. So the model is choosing to install here a 9-kilowatt PV system and a 17-kilowatt, 28-kilowatt hour battery, stationary storage battery system. And so you can see that in the column here the energy costs are reduced by about \$500.00 a year and then the demand charges are reduced by about \$2,500 a year, and so over the lifecycle here of the system, considering the capital cost, the demand cost, et cetera, and then these savings, this site's able to save about \$21,000 by deploying these technologies. You can go to the next slide please.

Next we wanted to look at the savings that could be found from allowing the model to charge the vehicles again using these flexible parameters of an arrival time and a departure time. So same total electricity consumption but kind of letting the model choose when that's consumed. And so here again the demand charges are lowered from \$4,500 a year to \$1,400 a year, and there's no kind of impact on the energy charges here. So you can see just in this one week where before the peak demand was about 23 kilowatts it's now down to about 8 kilowatts. You can go to the next slide please.

Finally, we looked at putting all these things together, so solar PV, battery storage and these optimal charging and discharging. So what we found here was the model wanted to build PV, but being able to provide this flexible charging infrastructure negated the need for the stationary storage from the techno-economic sense, and so you can think of this capability to do flexible charging almost as a stationary battery. I have two more slides of unrelated additional work. I'm going to skip those here for the sake of time, but if the slides are distributed there are links to additional work in the slide deck. Thank you.

*Deb Cloutier:*

Thanks, Emma. So appreciate it. You know, members of the Better Buildings community have been clamoring for more information on EV charging stations over the last year, both from a hardware and a software perspective and the business case over, you know, how and where to get the greatest return. So there's a number of case studies and additional information on the REopt site and the Better Buildings Solution Center. So with that let's go ahead and move to our last presenter, Drew Torbin of Black Bear Energy, who is the founder and CEO of Black Bear Energy.

Black Bear is focused on accelerating the adoption of clean energy, and in just the past five years his team has helped clients bid out over 1,000 clean energy technology projects in more than 20 states. Many of us remember Drew from his prior role while he was at Prologis, where he founded the Renewable Energy Group and deployed over 120 megawatts of distributed solar projects. So I would say Drew has a lot to share with us about clean energy and solar projects, but Drew will you please tell us about the state of the clean energy markets across the US and what your firm is seeing as the hotbeds of activity and opportunity?

*Drew Torbin:*

Absolutely, Deb. Thanks so much for having me. I'm also starting my timer. I know you run a tight ship here, so we're on it. So I'll tell you very briefly about Black Bear just by way of background some people know, and then we'll talk about some of the markets. If you go to the next slide please. So we are a buyer's representative specific to clean tech and renewables. That sets us apart from a lot of the others in the market.

We're not a developer, we're not a financier; we work just for our clients to help them deploy these projects, and the most importantly we are data driven, and we'll talk about that here in the next slide. So some of our key metrics, we represent over 65 clients. These are all institutional property owners or nearly all institutional property owners and managers, and pretty much every

asset type out there is part of that group so industrial, multifamily, office, entertainment, retail, all that is included and we work throughout North America. We do focus really on three technologies; solar, stationary storage and LED lighting, and solar or solar plus storage is definitely the bulk of our work.

We do about 85 percent of our volume there. We average 1.5 RFPs per week. The average RFP is a handful of sites and that works out at least year-to-date for 2020. That's us RFPing about one site per day. So a lot of the data that I'm going to share with you guys comes from that set of RFPs and we just have a great set of data in terms of market PPA rates, market rental rates, lease terms, timelines, a lot of different places to compare things to. Next slide please. Thank you.

Just a few logos. We're very proud to work with all of our clients. These are some of the ones that we share on our website, and a few of you all are listening in, so thank you very much. Okay. So let's talk about some of the markets. The first thing to understand before you talk about the specific states are the different ways that these solar projects can be set up, and there's really just two things that – to keep it basic two questions you can answer that will help your solar project get structured. First is who's going to own the solar project itself.

That's the purple-red square in the middle there. That can be the landlord, it can certainly be your tenants, or it could be a third party. Most of our clients typically opt for third-party ownership. They come to that decision because perhaps they're not able to monetize the tax benefits, perhaps they want to use their capital somewhere else. There's a variety of reasons for why they may want to do it. We do have a few clients that will own these projects and monetize the tax benefits.

We have one client – we can't talk about it yet because they've not made the announcement – they're doing some great projects and they're not monetizing the tax benefit and they're still hitting their target return, which is super exciting to see. The second question after you decide who would own the solar project is who's going to purchase the energy that it produces, who's the off-taker, and that's that green circle. And depending on what market you're in there's a few different choices, but certainly the landlord if there's a common area load would be your first stop.

Your tenants could certainly purchase that electricity, although they don't always have the lease term to match the solar lifetime.

There's a number of states now that have community solar, which is a really cool structure where you can sell energy offsite to a variety of subscribers that are usually households. Sometimes there's extra incentives that the state provides for low and moderate income households, which is fantastic, sometimes there's small businesses, and then in a few markets you're actually able to even sell directly to the utility, but once you figure out those two pieces of your structure the rest of it starts to fall into place. Next slide please.

All right. So first poll question here. We're going to test your solar acumen. We can go to that question. So I'm curious which states you all think is the most active for commercial and industrial C&I solar. Okay, everybody's pretty on it. Yeah, so the three top answers are on the page there. California, you are correct, is the top market for C&I solar. Last year actually New York was number two.

Somebody put New York. And New Jersey was number three. The difficult thing when you look at some of this data now, and if you look at the places that track that – Wood Mackenzie puts out a really good set of reports every year along with Greentech Media, but if you're looking at that data it includes both onsite commercial and industrial solar that's using the energy onsite, but it also usually lumps in community solar into that same piece. So New York really took off with community solar. Some of the other places like Colorado use community solar as well. Next slide please.

Great. So there's the top 10. I was just asking you all what you thought number one was. But these are the top C&I solar markets and they're all very different. California, there's a lot of net metered projects that take place there. If you're lucky enough to have a building in Los Angeles you can sell the energy back to LADWP and that's a great market. Hawaii, for economic reasons, electricity is so expensive that projects make sense there.

But when you start to look at places like Minnesota and Illinois and New York, now New Jersey and certainly Massachusetts, a lot of that volume is being driven by community solar. Not all of it, but a substantial amount of that volume is being driven by community solar. That's an opportunity for those of you that have assets that have larger rooftops or potentially parking lots that can host solar, to not only have energy that's used onsite that lowers your own carbon footprint for that site but to host solar that can then go into the grid and provide renewables to others that may not



actually have places on their homes or on their businesses for solar. Next slide please.

So this is – we get asked all the time about sort of the most exciting thing in solar, and I think a lot of people expect a technology answer to that. In my mind this slide right here is the most exciting thing about solar today. Almost the entire map was active in 2019 with C&I solar. So I'm including any state that had active megawatts installed in the calendar year 2019 for commercial and industrial solar. If you were to look at this map not that long ago it was all about California, it was all about Jersey.

There was really only a few places. And now no matter what state you're in, or almost no matter what state you're in, there's a possibility of installing solar. Certainly these markets are very different from one another, and anybody that's spent any time exploring projects within your own portfolio knows that, but the fact that it's possible and starting to even become more lucrative in some of these markets is truly exciting. Okay. So next poll question here. All right.

The answer is the most lucrative solar market, which in the US it's Washington, D.C., and I'm curious – some of you may know the answer to this – but if not you can guess, how much can a landlord receive for renting a roof in D.C.? And this is by square foot by year. So \$1.50, \$1.00, \$0.50, over \$2.00. It's like a live bidding platform here. This is great. You guys are right on it again. Over \$2.00; in fact, the projects that were currently bidding out in D.C. are seeing rents in and around \$3.50 per square foot per year, which for solar is very, very high.

The average throughout the US, if you included every other C&I market, is about one-tenth of that. So if you have a building inside the beltway – it's important that it's inside the beltway – I'm just checking the time to make sure I'm doing okay – those are really strong assets for solar. I highly encourage you to explore them. Next slide please. So I showed you where the Wood Mackenzie report data is coming from to give you an idea of where we're working with our institutional clients. These are the markets that we are most active in.

Not the only markets we're active in but the ones we're most active in. And the part that leads I think our clients to be active in these markets, the economics are strong, the programs have a large amount of capacity, and they typically overlap where our clients have a lot of assets. So if they get to know a certain market, like

Illinois, they know they can transact multiple sites, say, with California, New York, Massachusetts and certainly D.C., as we just showed. What's not shown on this slide is a lot of these have near-term milestones, so that's something that I would strongly encourage everybody to look into.

If one of these markets is of interest, some of these programs have windows that are starting to close. Next slide please. So this is my last slide. We're happy to share the unredacted version of this with any property owners. Just email us directly. We're happy to share it with you, but this is the type of data that we have from RFPs.

So there you can see the D.C. answer, \$2.00 to \$3.50 per square foot. We also track that on a per-megawatt basis, which is important. The more lucrative the market the less square footage you need to have that make sense, so D.C. of about 15,000 square foot of usable, deployable solar area and you'll have a lot of interest from vendors. The other columns that you see here – are carports viable? Carports are more expensive than a rooftop solar project or a ground-mounted solar project, so a more lucrative market is needed to be able to deploy carports, and that's where you see if they're viable or not.

Midterm roof replacements. If the roof is going to need to be replaced throughout – during the solar term, again, you need to include that in the underwriting and you need a more lucrative market for it. And then on the far right column you see some of the notes about where these programs are, if they've got a decreasing block, a current block. In the case of LADWP, how many megawatts are remaining in that program. That number's as of Friday. But again, happy to share this if anybody wants to reach out on the markets that they're in that may not be shown here. Great. Thank you so much, Deb.

*Deb Cloutier:*

Thanks, Drew. Really appreciate it. I know there is a lot of active interest from our CRE community related to solar, so that was some really good information. Now we are going to transition over to the final segment of today's session. It's our live Q&A. If you have questions and you haven't already submitted them, go to the Slido.com and enter the event code, #bbsummit, and select CRE meet-up from the dropdown menu. So now I'm going to go ahead and queue up a few questions for our presenters today.

The first one is, is someone at DOE looking for energy efficiency topics that have been missed and might be a major or huge opportunity for energy savings emissions reductions? I'll go ahead

and take that one as an individual who has had the pleasure of working on the Better Buildings Initiative for many years now. Yes, we evaluate this on an ongoing basis each year in the development of our sector strategies. The National Labs help us in identifying where those opportunities are, particularly from up-and-coming R&D and new innovations and when those technologies or approaches are becoming commercial ready. We also have a group called Market Solutions which looks at nontechnical barriers.

Primarily those are financial in nature and/or policy organizational impediments that may exist. The next one is asking a question about is anyone working with commercial lenders on allowing investors to include the cost of energy efficiency retrofits as part of normal allowances given for capital improvements? So I would direct folks to the Better Buildings Solutions Center. We have a number of case studies and implementation models, particularly in the collaboration with the financial allies, which is a member segment of the Better Buildings Initiative, and there's also been some really interesting research coming out of another lab, Lawrence Berkeley National Labs, that has been looking at the connectivity of energy efficiency and financial performance, particularly in reduced default rates associated with mortgages.

The third thing is there is a tool on the Better Buildings Solutions Center called the Financing Navigator, and you can use that to identify and get connected with different lenders. So increasingly it is becoming more commonplace for lenders to allow for energy efficiency financing, and groups like Fannie Mae and Freddie Mac, who are the GES – the lenders primarily of the multifamily space, obviously they have additional programs focused on higher loan proceeds for energy efficiency and water efficiency measures. Okay, next up, this one is for Audi. I actually have two questions for you.

One question was in existing BPSs aren't time differentiated EUI or fixed emission – where did my question go? Sorry. Okay, emissions factor. So how can BPSs consider that when energy is used matters for Co2? So okay, I think if I'm going to reword this they're asking is there like a time of use that's also important in trying to differentiate and determine these fixed emission factors? Audi, are you there? Can you try and talk about one for us?

*Audi Banny:*

Yeah. I would say that the answer is – it is important, and I actually – I'm unable to answer this question at this time. I do think *[laughs]* –

*Deb Cloutier:* Yeah, it's kind of a tricky one.

*Audi Banny:* Yeah, but I would say I actually did flag it internally because, you know, from our utilities work and looking at the grid and how we're measuring this is part of that conversation, but there certainly isn't clear information on this particular question as of yet, but I have noted it and will certainly want to follow up if the individual that had asked the question would like to do so.

*Deb Cloutier:* The devil is really in the details in most of the specifics of how these different legislations are being enacted. Audi, one more question for you. Are any of the cities shown on one of your slides earlier going to use normalization factors in their standards, like weather and occupancy?

*Audi Banny:* Yes. So Washington, D.C. and St. Louis will be doing that.

*Deb Cloutier:* Okay, great, great. Let's see. Okay. Drew, next up for you. Can you share the Mackenzie report mentioned re: solar market rankings? Perhaps we can agree that we can email that around to folks. Is that like a freely-available report?

*Drew Torbin:* It's a paid-for report and a free version, so we'll send you the free version and absolutely that can be shared.

*Deb Cloutier:* Okay, great. And then the individual asking that question can choose to pay for it or not. Let's see. Next up...oh, there was a question about is anyone working with banks to get them to accept energy efficiency – or no, sorry, we did that one. There was one other one though that was asking about banks and whether or not work is being done on sort of banks as a property type. Yes, we have several very active both Better Buildings Alliance and Better Buildings challenge partners. Bank of America is one that comes to mind quickly, but I know there are several others that we have both implementation models and solutions at a glance for what they've been doing in their bank branches, and they're also very active Energy Star partners and on the Energy Star website they have some resources related to bank branches and things that are common, efficiency improvements that you can make there.

So just check out the Solutions Center again, a recurring theme on what's available. What is – okay, so Drew, this one is back to you. What is the timeline for a less-than-a-dollar-a-watt panel? Do you have a perspective on that?

*Drew Torbin:* Yes. It's about four years ago. *[Laughs]* The panels today are somewhere in the neighborhood of 40 cents. So rooftop projects all in turnkey in most markets is \$1.50 per watt, and the first project I ever did with my prior employer, which was in Europe, was \$8.00, so we've come a long way.

*Deb Cloutier:* I would say we have come a very long way in solar. Okay. This question is actually for Rielle. I'm not sure if you're still on the line or able to unmute your phone, but if you are there was a very specific question about one of the challenges that a fellow partner is having calculating financial value at risk for assets when quantifying the resilience capacity or investment at the municipal level. They were wondering, Rielle from DWS, if you guys have actually been integrating that into your approach so far?

*Rielle Green:* Yeah, great question. I think you can hear me. I think I'm unmuted.

*Deb Cloutier:* You're unmuted. You're great.

*Rielle Green:* Awesome. *[Laughs]* So I would say it is something that we do consider for our internal checklist. We do include a transitional risk component, so we check on, you know, local emergency plans as far as what cities have released and what is in the pipeline there, but when we actually focus on our asset level assessments we don't tend to rely on local government considerations there, just as it's been hard to kind of plan around those. When we're looking at our specific assets and what protections we're putting in place that's largely been as a result directly from what our consultant has advised, but it is considered. Hopefully that helps.

*Deb Cloutier:* Great. No, thanks, Rielle, that was wonderful. Just given the time we're going to go ahead and move to our last polling question of the day. So if I could have that one brought up for us. So for many folks that have joined us before for the CRE meet-up it is an in-person event with lots of camaraderie and lots of networking. As we continue throughout the rest of this year, when we will likely be challenged for getting together in person beyond this CRE meet-up, do you have an interest in any additional virtual networking that the Better Buildings team might be able to facilitate? So the responses have come in and it sounds like we'll be doing more of this in the very near future.

Okay. So let's move on now. We'd like to show a super quick video that promotes the Better Buildings Solutions Center. As we said before, it has over 2,800 solutions to help you find proven and

cost-effective energy and water efficiency solutions. So let's go ahead and learn a little bit more about it.

*[Video plays from 1:25:00 to 1:25:51]*

Thanks, Andrea. So coming back to our slides now we would like to highlight a few additional resources that are available on the solutions center. We will make the slides for this session and all sessions in the summit this week available on the Solutions Center, and when they are available you'll be able to click on the links that are embedded into them. So these are some of the resources that we think are most related to the topics we covered today or that we've been getting a lot of interest and requests for, so we're highlighting those. And then moving onto our next slide, this brings us to a close for our session.

I would like to personally thank you for attending today and really hope you enjoyed the session as much as I have. For those that will be attending additional sessions this week, we'd like to draw your attention to several ones that we'll feature, commercial real estate partners. The first one is Early Best Practices from the Waste Reduction Pilot, linking up with what Hannah was talking about earlier today. You can hear from Shorenstein Properties and Volvo to learn best practices for waste management, early results from the pilot, and the connection between energy and waste. Next up is the Secrets of Better Buildings Goal Achievers.

So this will be an interactive discussion with a group of our partners from all sectors and they'll share their personal experiences and insights into the tools that led to their success and find out how to apply those similar strategies to advance your portfolio program. And then I think the last must-see is the closing plenary, a Path Forward: Perspectives on Efficiency and Operations. This plenary will examine actions from improving energy efficiency and public health outcomes through operations in maintenance in the times ahead, really kind of coming full circle from this morning's plenary where Dr. Joe Allen shared with us a lot of his strategies.

So we'd also like to invite you, moving to the next slide, to attend the Better Buildings Summer Webinar Series that we mentioned earlier. This is where we're going to put much of the content that we weren't able to cover this week. We'll sort of be rolling it out throughout the summer, and you can register for any of these sessions on the Better Buildings Solutions Center by clicking the 2019/2020 webinar series. And with that, I would like to thank all

of our panelists very much for taking time to be with us today from all of your locations. And if you'd like to learn more about the resources discussed today please check out the Better Buildings Solutions Center or feel free to contact me or any of the panelists at the emails shown. Thank you, and I look forward to seeing you in additional Better Buildings Summit Sessions this week. Cheers.

*[End of Audio]*