Maddy Salzman: All right. Thanks, everybody, to everyone who has joined on time. It's fantastic to have you all here and thank you so much for joining us for the Better Buildings Summit. This year of course it's now a virtual leadership symposium and we hope that that means that more of you are now able to participate than ever before. And we're excited to get started. So Alison, you can jump to the next slide. Great. So hopefully this is the virtual room you intend to be in today and we're excited to have you here.

Right now we have a wonderful meet-up prepared with some fantastic speakers on workforce development activities. That's a picture of me there. Oh, back one. Great. I'll be moderating and probably more accurately am seeing today's session. We'll be hearing from lots of speakers though and I don't want to take up too much time introducing myself. Just saying I've been at the Department of Energy since 2015 in the building technologies office supporting home energy score as well as workforce development activities. So thank you all for joining.

You can go to the next slide. So we have a full agenda today. As I mentioned, we're gonna hear from lots of speakers who are working with the Better Buildings Program and the Building Technologies office on a variety of work force development initiatives that we're really excited about. We will have – we will be using Slido. We'll have a slide on that in just a moment. So please be prepared to both ask questions throughout that we'll address at the end as well as answer our poll questions that we have set up.

Next slide. So a few housekeeping points that I'd like to make note of. Please note that today's session will be recorded and archived on the Better Buildings Solution Center. We will follow-up when today's recording and slides are made available. All attendees have joined as a muted format, but if you are having any issues with unmuting or anything else as you are needed to speak, please just let us know. We do ask that you keep yourself muted as much as possible though to avoid background noise. If you're experiencing any audio or visual issues at any time throughout today's session please send a message in the chat window located in the bottom of the Zoom panel.

We are excited that we are also wanting to promote this conversation on social media. So you can see the hashtag BB Summit 2020 and Twitter and LinkedIn accounts where you can follow the conversation. Next slide. I already mentioned we will be using Slido. So please go to Slido.com or you can download the

app on your mobile device. It's an interactive platform for Q&A polling. If you go to the website you need to enter the code BB Summit and then select today's session title in the drop down, which is the Workforce Development Meet-Up. If you'd like to ask our speakers any questions please submit them any time throughout the presentation. We'll be answering your questions near the end of the session.

I will give everyone a few moments to open up Slido and select our session. All right. Now I'm in it too. So to ensure that we are all using Slido correctly and to better understand today's participants, we'll go to the next slide, which will open up our first poll question. So Alison, are you able to activate that poll? All right. So you should see poll number one come up. What area best describes your role or your organization's role supporting building energy efficient workforce? So we have a few options here and we're excited to see who's on the line.

A bunch of others, but right now mostly policy advising and program management. Also a lot of research and education providers. We'll definitely have to figure out who fits into the other category after this. We're excited to have you on board as well. We've heard from a little bit over half of folks. So I'll give another 10, 15 seconds or so. Very least it's just helpful for us to have a better sense of who's on the line and get to tailor our talking points appropriately. A lot of researcher, education providers, which is great and also makes sense.

We can open up the second poll question. Poll number two. Great. So this one there's no multiple choice. We'd just like for you to enter what workforce topics or challenges are you most interested in? You can also up vote other people's responses and just let us know. We see how to recruit as one thing, increasing diversity has also come up. Again, just to better understand who is here and what are the major issues that you care about. Career growth and continuing education. Great one. Now we're getting a bunch. People needed a moment to think. This is great.

Even if we don't touch on every single one of these throughout today's session it'll be great to just better understand folks attending today and what things interest you the most. Getting lots of things about curriculum development, workforce training gaps, green building concepts, funding for initiatives, real estate industry, value of credentialing, light versions of credentialing, using controls, marketing services. Awesome. I love all the brainstorming happening here. This is great. Well, I'm sure many

of these things will come up throughout the session and if not, we'll have plenty of time for questions afterward as well.

Like I said, we'll be using Slido throughout. So if you were not able to get in it just yet, please join at Slido.com and use BB Summit. All right. With that I wanna introduce today's presenters. I've already given a brief introduction of myself there, but we are also joined today by David Nemtzow, the director of the Building Technologies Office at the U.S. Department of Energy as well as Sarah Truitt who works with the National Renewable Energy Laboratory or NREL.

And aside from just these speakers we also will be featuring about a dozen other speakers today. I think if you click next there might be an animation featuring the many speakers from the Advance Building Construction awardees as well as our founding partners of the Better Buildings Workforce Accelerator, which you maybe have heard mentioned this morning. There it is. So we're excited to have so many speakers joining us today and looking forward to hearing what everybody has to say.

We can go to the next slide. So first I will introduce David Nemtzow. David, like I mentioned, is the director of Building Technologies office. He brings more than three decades of experience in energy efficiency industries to his role and we're excited to have David here to provide some opening remarks on BTO's workforce development efforts. So with that, I will turn it over to David.

David Nemtzow: Thanks very much, Maddy. Glad to be here and glad you're having this session today. Very important topic. It's been an important topic in our field for many years, but I don't think evermore so during this unfortunately, particularly appropriate period when 40 million of our fellow Americans are currently out of work, period. So we know it's not just a matter of workforce issues within energy efficiency, but the broader issue of Americans being able to work. So let's talk about our role there. I have to say, are the slides up? For some reason I hit a button or I don't see the slides. Are they being presented right now?

Maddy Salzman: Yes. They are being presented. We currently have the EERE mission slide up if that helps orient where you're at.

David Nemtzow: Yeah. Sorry. I have – they have disappeared for me. I see your image very well, Maddy, but I see nothing else. So okay. I'm gonna look at – luckily I have two computers going right now. So

I'm gonna look at the other one. So the mission – so I'm the director of the Building Technologies office. We are, as our name clearly says, responsible within DOE for the energy efficiency and energy performance of our nation's 125 million buildings, 119 residential buildings. I'm sorry. I have a cat chasing a bird in my house. Forgive me for one second.'

Maddy Salzman: So really quick I can just jump in here.

David Nemtzow: He was just chasing some critter. Sorry about that. The critter has been liberated. The cat has been trapped in the bathroom. Sorry for the unprofessionalism. So welcome to the new era. So our nation's 125 million buildings, they consume just under 40 percent of U.S. energy consumption. So that's more than energy, more than transportation. Thirty-six percent of U.S. CO2 emissions come from buildings, a total annual bill to heat cool and light buildings are $410 billion plus, over $400 billion annually, and a quarter of that is wasted or maybe more. Maybe 33 percent or 40 percent is wasted.

So obviously we need many things to tackle the problem of efficiencies everybody on this call knows. And as much as we believe in technology and at BTO, at the buildings office where we have technology in our DNA, but technology alone doesn't do the trick unless there's a workforce that knows when to use the technology, which technologies are appropriate, how to install the technology properly, how to operate it, and how to make sure that those technologies and practices and other techy things are behaving the way they are without any reduction to comfort or productivity that leads somebody to say this stuff doesn't work.

So without a strong workforce our field doesn't stand a chance. So we're a part of the energy efficiency renewal office at DOE and you can see the mission of EERE. I think it's obvious to focus on energy efficiency renewable energy. Again, our office, BTO that Maddy is in, is focused on energy efficiency and demand flexibility in the building sector.

Next slide, please. So what is the energy efficiency workforce? This is a tough question. We could spend all day, all week discussing it. It's relevant because like many energy efficiency decisions, they're not really energy efficiency decisions. The energy efficiency workforce, many workers in our field and it's been calculated to be about 2.3 million or even a little more, 2.4 million workers who are in the field. The whole range from research to manufacturing, professional services like architect and

engineering, as well as related fields such as real estate and first – and the state officials and local officials to construction and operations, all the way to those who provide services via utilities or otherwise provide programs through small businesses.

There's enormous diversity there. Very few of them and very – so important to our work – very few of them self-identify with an energy efficiency worker. Maddy Salzman and I do. We know this is what we do for a living. I don't think that worker who goes to work in the morning at Tesla or building a Toyota Prius or whatever, a Chevy Bolt, they probably don't think of themselves as an energy efficiency worker. They probably think of themselves as an auto worker or whatever the case may be and similar in other fields, architecture or technology.

So it's very important that as we think about this we think about how to reach people who don't self-identify and may or may not be going to the energy and energy efficiency workforce site or say, "I really wanna become an energy efficiency worker. How do I get trained and certified?" Some do and we wanna get that number up, but many are in one of these other fields that increasingly overlap with efficiency. There's probably no – well, many great examples, but let's think about that third one.

Construction and facility management as more and more buildings have to meet more stringent building codes, we need construction workers who can understand what are the challenges and how to build buildings tighter and better and still high performing and on and on. So this is a perineal challenge to our field, but one that we have to address. Next slide, please. The work that we're doing at the Building Technologies office and more broadly at DUE and through the Better Buildings Accelerator and the other Better Buildings activities, we have a lot of activities to support workforce development.

I don't think I'm revealing the state secret to say that we don't come as a whole or department doesn't come from a workforce background. We're very active. I said earlier, we have technology in our DNA across the department and certainly in efficiency and renewables, but we do a lot of activity around workforce issues and training and education and quality installation and that's not just at our buildings office or colleagues in the solar office, certainly our colleagues in the weatherization assistance program, federal energy management program, as well as other offices such as the office of electricity and the fossil and nuclear offices understand that a

skilled workforce is essential to meet our energy climate and economic goals.

So as you can see here, there's a brief summary of how we tackle it at the buildings office. We do analysis. You're gonna hear from Sarah Truitt at NREL. NREL is a key partner with us as are many others on the issue of how do we analyze, how do we strategize, how do we think about the focuses. Look, 2.3 million workers in America who owe their livelihood in whole or in part to energy efficiency. We don't have enough resources ideally to help all of them. So being strategic, figuring out what our priorities are, what we can do best is essential to making our resources be impactful rather than overreaching or underreaching.

We also are working – you can see from the middle one – on looking at RND and related practices around where the workforce is going in the future. We have a major new initiative at BTO called Advance Building Construction, ABC conveniently for short. What ABC is looking at is the damning question. I will depress you. There's no other word for it. I will depress you by pointing out that the labor productivity of the U.S. new construction industry today is lower than it was when World War II ended. Lower. The average productivity per worker in new construction is less today than it was in the late '40s and early '50s.

There are a lot of reasons for that. One of them is that our industry, construction, has not adapted the same measures of productivity that other industries notably manufacturing and assembly manufacturing have done, enabling digitalization, robotics, using advanced new materials that can improve labor productivity, et cetera, et cetera. That's what our ABC, Advanced Building Construction initiative aims to do. It's to bring in digitalization and robotics and modular construction off site to help supplement the work that's done on site in the energy efficiency field through people on site with hammers and nails and work gloves. And we need to bring in that technology.

Construction is the second least digitalized part of our economy after agriculture. So we need to change that as a whole. And finally, of course we can only do it in partnership. In partnership means working with the Building Trades Unions. It means working with the employers. It means working with that 30x percent of you who clicked on being involved in education or research. So we're very anxious to do that and get your help and also provide what assistance we can. So that's where we're coming from. We understand this is a priority. We've heard that if you were on the

opening plenary today you heard a discussion of this from our undersecretary of energy and our assistant secretary, Daniel Simmons. Our undersecretary, Mark Menezes, that we understand the role of – the leadership, political leadership at DOE understands not only how important energy efficiency is going forward, but why we need a qualified skilled and plentiful and diverse workforce that can find opportunities and successful careers.

I'll say this, Maddy, implied. You can see the color of my hair. I've been doing this for a while. I've been doing it since I was in college. It's a great field and it's an exciting field. Not enough people know that. They don't know what energy efficiency is. So they don't think it's exciting. They might find solar panels more exciting. They're mistaken. Energy efficiency is more exciting than solar panels or electric vehicles because it accomplishes so much in terms of improving the national economy, environment, and our belief in moving to the future. So thank you again, Maddy and team, for organizing our session today.

Maddy Salzman: Absolutely. Thank you so much, David. Really appreciate you taking the time out. We can move on to the next slide where we will begin diving into these areas that David mentioned into a little bit more detail. To start off, as David mentioned, we have strategic analysis activities to assess the challenges and determine potential strategies to address challenges in the energy efficiency workforce. And we're excited – I'll start off with the next slide and then turn it over to Sarah Truitt. But David brought up a few of these already.

So there's a number of challenges that we're dealing with in the Building Energy efficient workforce. I know one David brought up was productivity issues related to constructions overall, but there's a lot of other bits and pieces that we're looking to better understand and also better understand how to address. So starting with low interest and awareness, many students and young people are unaware of the career opportunities that are available to them in the Building Energy Efficiency sector and they might have preconceived notions about these careers that are maybe outdated or inaccurate.

We wanna make sure that young people have access to good information about the opportunities available. Even if they are interested we know that there's confusing pathways. Building science credentials are fragmented and often nontransparent. We'll talk a little bit more about that later. We also know that the efficiency workforce is lacking in diversity, that women and

African Americans are underrepresented in the current workforce. This means that we're not pulling all the talent we could be and making sure that every person that can bring new skills to this work feels welcomed and rewarded for doing so.

We also know that we need to have better access to efficiency education overall both at the onset and throughout. Again, we'll talk more about that later. Finally, improve quality installation practices, which can often result in energy efficiency losses as compared to if these technologies were installed as well as possible. If you click next there should be another one that pops up, which is another one that David mentioned that an overarching issue of a lacking work, energy efficiency workforce identity.

Most people who work on Building Energy efficiency primarily identify as being part of a different sector, whether it construction, manufacturing, business services, something else. What's important here is that of course we're not going to change architects identifying as architects, but understanding the ways that we're connected across these fields and can accomplish great things together. So with that, on the next slide I will turn it over to Sarah Truitt, who I mentioned from the National Renewable Energy Laboratory to go over some of the strategic analysis she's been working on in her role. Sarah, take it away.

Sarah Truitt: Thanks, Maddy. Hi, everybody. I'm Sarah Truitt from the National Renewable Energy Lab. As Maddy said, we've been working together to do some background research to help inform where BTO should focus their efforts. We obviously all know there's been historic job loss, especially in the construction sector, over the past few months, but the Buildings Technology office is taking the long view of course to prepare the workforce for decades to come.

So we do think that these long term forecasts will still come to bear once we can get through all of this. So it's notable. So before the coronavirus, 22 percent of new construction workforce was set to retire over the next decade. That's leaving 1.6 million jobs open and the Department of Labors, Bureau of Labors statistics had forecasted it by 2028 there would be 800,000 more new construction jobs in addition. So we've got quite a void to fill.

Sustainability and energy efficiency shows no signs of slowing down either, especially as the next generation or Generation Z comes into home ownership age. So the youngest Gen Z right now is eight years old. So in the next decade they'll be entering the

workforce and then the next couple decades entering probably home ownership and they are very climate conscious and expect that their homes will be high performing. So I really think that this is something that will continue to be embedded into the build environment and that companies will have to provide that.

So we see a lot of new skills that are going to be needed over the next decades in this area and that is what this effort is all about. Even with – after the coronavirus all shakes out, we do think that there will be globally a big drive for construction as well. So there's some statistics here from before COVID-19 that UN predicted that the square footage of New York City would be built every 34 days for the 40 years. Now that's globally. And this graph on the bottom here shows that new housing starts in the U.S. are expected to be about 40 percent higher in 2028 than in 2020.

So right now we have a housing deficit and we were forming about 200,000 more households per year than new housing starts. So that housing crisis is getting worse. Let's go to the next slide. So that's a backdrop that we have for our workforce and the skills that we need to address coming up. So the goal is to increase the quantity, the quality of skillsets, the diversity and productivity of the Building Energy Efficiency workforce. So some of the ways that BTO can address to do that is to build interest and combat some of the negative perception about being in construction and showcasing these careers as welcoming and impactful and rewarding.

We talked a little bit about there being many, many options to get energy efficiency credentials and working to clarify and streamline those pathways is also important. Then of course we talked about the poor quality insulation wasting up to something like 30 percent of energy of a building can be wasted just with poor quality installations. So we need to make sure that we can improve skills and have the right training for our workforce to do that. Next slide. And tomorrow you can hear a lot more about this. I'll hand it back over to Maddy to talk about the session she's moderating tomorrow.

Maddy Salzman: Yes. Awesome. Thanks, Sarah. And we just planned a couple slides for Sarah to give an overview of some of the work that she's been leading, researching market trends in this space, but I'd be remiss if I didn't give a plug for tomorrow mornings session on building a clean energy workforce that I'll be moderating. Sarah will be going into much greater depth about some of this work and some ideas for how these challenges can be addressed.

We'll also be hearing from Dean Stanberry of the International Facility Management Association and Philip Jordan from BW Research. So I think it'll be a really great session. It's at 11:00 AM Eastern tomorrow. Next slide. I also wanted to mention, you might recall from David Nemtzow's slide there were three buckets of areas that we work on. The first Sarah just went over our strategic analysis. The second is research and development funding opportunities. So I just wanted to highlight here an overview of one last year, one that's out this year before we dive into announcement of the awardees from last year's advance building construction project.

So as David mentioned, last year we launched the Advanced Building Construction Initiative which featured a subtopic on building assessments, technology installation, operations, and maintenance workforce activities. This funding opportunity has been awarded. In the next few slides we'll go over – or we'll give a chance for the awardees to discuss the activities they have planned and a few months ago we worked in collaboration with the solar technologies office and the vehicle technologies office. I know David was saying efficiency is more interesting than some of those, but we know that we can get the best work done if we're working collaboratively.

We launched a funding opportunity called Empowered. It's kind of a mouthful, but it stands for Educational Materials for Professional Organizations Working on Efficiency and Renewable Energy Developments. So there's a topic on emergency response for firefighters as well as safe distributed energy resource building integration with building, fire, and safety department officials. Right now we are in concept review stage for that funding opportunity. So these are just some examples of activities we've had going on as part of our workforce development areas.

Next slide. So as I mentioned, Advance Building Construction awards are now live, so to speak. So we are taking this opportunity to kick off our Advanced Building Construction workforce awardees. So over the next few slides I will give each of the leads for those projects a chance to introduce themselves and the exciting work that they're getting started on. So up first on the next slide we have Joe Sarubbi from the Interstate Renewable Energy Council, IREC. Joe, can you take it away?

Joe Sarubbi: I can. Can you hear me?

Maddy Salzman: We can.

Joe Sarubbi: Wonderful and I'm glad everybody who is on the call cause able to join us. I'm Joe Sarubbi, the principal investigator for this award and project manager for the Interstate Renewable Energy Council and excited to be a part of this great initiative. We are, yes, building a career map for the energy efficiency business – building, the sector, and of course David did a good job articulating the problem about what are energy efficiency jobs. Most people don't even associate with that and it's been already well-articulated by him and Maddy *[break in audio]*. I'm gonna talk more about what we're gonna do about it.

The neat part about a career map is it gives us an opportunity to help support the other programs that are a part of this initiative and all the other training programs that are currently out there across the country trying to build a skilled workforce for the energy and efficiency environment. So let me first tell you a little bit about our team members. We've got the Building Performance Association, the Building Performance Institute, Community Action Partnership, National Institute of Building Sciences, and the Home Builders Institute all partnering with us to help us push this out the door.

We've got a plethora of subject matter experts who's gonna help validate this career map and really move it to the next level. Our work was involved with developing two other career maps, this one being, that you see, the solar career map. If you recall years ago *[break in audio]* big green buzz and everybody wanted to get solar energy. People were like, "How do I get a solar job," when they didn't even know what a solar job was. So again, the idea of creating an awareness and recruitment tool for all the programs that are out there, but just also give people a chance to see that either what they're doing could lead instantly into a solar job or a particular career path that even if they started in more of an entry level where they might be down the road and all the different opportunities that they could have from a specific job.

Part of the hope too is to reduce the stigma around a lot of certainly the construction energy jobs and the building jobs and by making people aware of all the different opportunities and the really fun technology that's out there today around this I think becomes real important. So we're hoping that this career map will build off similar career maps that we've done in the past. *[Break in audio]* recently was for the California Community Colleges Chancellor's Office for the careers in climate technology that's around the

HVAC industry. So we're gonna be following this same kind of format that you see in this one slide a little bit.

Again, our focus is a viable awareness recruitment and retention tool. We see this covering a very broad audience. The career and guidance counselors, educators, learners, policy makers, and obviously the job seekers. We anticipate that this will be extremely informative, a one stop for resources, the opportunity to have a lot of different resources in this particular website where people can dive deep once they start to get excited about jobs will be a place for them to at least start to get that information. We're excited to really support and help all the other initiatives and really start to help build a talent pipeline for – with a skilled workforce for energy efficiency. Thanks, Maddy.

Maddy Salzman: Thank you so much, Joe. Up next we have Michael Bobker from City University of New York City College. Michael, are you able to unmute?

Michael Bobker: Hi, Maddy. Thank you. It's a pleasure to be here. My name is Michael Bobker. I direct the Building Performance Lab at the City University of New York. We've been involved in training operators, building operators in the New York City area for the last ten years. So our project, our target for our project is operators in the operational phase of building life cycles. Our specific goal is to create a remote learning platform. We train website to improve skills and fill knowledge and practice gaps in a lifelong learning framework.

So extending from students to starting out transitional workers into incumbent workers who are moving up the ladder in the building operations field. The platform will seek to engage people from the industry, other educators, vendors such as vendors of building automation systems, vendors, installers and so forth who can all collaborate through what would be an interactive website consisting primarily of curated materials identified and selected with an industry advisory board. We will be looking out to the industry, perhaps the members of this workshop, the participants in this workshop who might wanna be part of an industry advisory board.

The emphasis in the material is on control systems and control sequences, trouble shooting them, providing enhancements to them through interactive instruction and mentoring, for actionable procedures – and I'm running out of time – for actionable procedures, downloadable control module upgrades and the like,

and focusing on operational improvements where there is – we've seen that there's large opportunity.

We'll be joined in our project by Controls Integrator, Terry Herr from Intellimation and the website will be constructed by our partner on the west coast, Si Chen of Open Source Strategies and we, as I mentioned, will be seeking participation in an industry advisory board and in the second half of our project after the website is up on participants for piloting the training materials, testing them out, and providing feedback so that we can own the platform. Thank you very much. Pleasure to be here.

Maddy Salzman: Awesome. Thanks so much, Michael. Up next we have Stacy Hunt from Confluence Communications. Stacy, are you able to unmute?

Stacy Hunt: I am. Can you hear me?

Maddy Salzman: We can. Thanks so much.

Stacy Hunt: Great. Thank you, Maddy. So my name is Stacy Hunt and I'm a partner and program manager with Confluence Communications. I will say in advance, I hope my Internet holds up. We're having a wind storm right now. So through various roles and organizations I've been working with DOE's buildings related initiative with a focus on education outreach and stakeholder engagement for over 20 years, which is embarrassing to admit, I think.

We're excited to be an ABC awardee along with our program partners, Pacific Northwest National Laboratory, Building Media Inc., Colorado Homebuilding Academy, Energy and Environmental Building Alliance – I saw Erin online here – and Lane Community College. Our project is incredibly simple and at the same time incredibly complex. We're all well aware, and Sarah and others have noted, of the intense need for skilled construction workers. Because of this obvious need there are many existing training programs in the market targeted at graduating high school students, transitioning workers, two year degree students, and continuing education.

Many of these programs include some energy efficiency information and many include none. Students are unaware of career opportunities related to energy efficiency and unaware of specific approaches and practices that can radically improve energy performance. This isn't because educators don't care. We believe it's often because they don't consistently have access to quality targeted, well-organized materials. There's also a large

body of existing viewing content that could be utilized by these programs to educate and inspire students, but it's not particularly accessible or a level appropriate in many cases. Excuse me.

Our goal in this project is to evaluate these existing construction education programs to identify opportunities to utilize existing content primarily from DOE's building, American Solutions Center, and other public domain sources to educate and inspire students on energy efficiency and sustainability and housing. Our first focus is on high school certificate programs and bootcamps for transitioning workers and next two year construction management degree programs and continuing education programs.

The ultimate goal, 'cause this question is like what are we really trying to do here, is – in our project is to create national model curriculum – I'll put those in quotes because it's a little bit cliché – for each of those program types that will be housed in DOE's building science education solution center that allows educators simply to lift content for incorporation into existing degree programs.

In the first stage of our project we're working with Colorado Home Building Academy because they have a very robust and well-respected curriculum in several of these areas to map the content for high school certificate programs and bootcamps for transitioning workers to identify where this opportunity to teach and inspire about energy efficiency and building science. Currently we're mapping the content that exists within the solution center that could be used for educational materials.

Next we'll undertake a similar process with two year degree programs with CO HBA, Lane Community College, Aurora Community College, and with the energy environmental building alliance. I think I'm running out of time, but in the next phase of our project we'll work with our program partners to test energy efficiency content in their various curriculum, make sure it works, make sure it's well-received, and the final result will be creating these national model curriculum and content sets that can be utilized by any new or existing program of similar types throughout the country. So we have our work cut out for us.

Maddy Salzman: Awesome. Thanks so much, Stacy.

Stacy Hunt: Welcome.

Maddy Salzman: Appreciate you rushing through that. Up next we have Roger Ebbage from Lane Community College. Roger, are you able to unmute?

Roger Ebbage: I am unmuted.

Maddy Salzman: Perfect.

Roger Ebbage: Thank you, Maddy. I appreciate the opportunity to present about our program. It is called the Western States Building Energy and Controls Apprenticeship Program, BECA, and really this is a culmination of the 40 years that we have been involved, that Lane Community College has been involved with commercial building energy efficiency and if you count 40 years back you will see that it was a response to Jimmy Carter's war on energy initiative. So when we started the program there was a tremendous amount of interest of course back in 1980. Tremendous amount of interest and we ran very well for a while.

I took the program over in '92. Still had a good amount of students, but we have seen an ebb and flow of students and really it is dependent upon our national leadership in terms of whether we have a lot of interest in students coming through our program or by students coming through our program or not. We thought that it would be a good idea to step this up a little bit and take our program online. So in 2016 we received an award from the National Science Foundation to do exactly that.

So our program is fully online working with the University of Oregon's Energy Studies and Buildings Lab and their director, Kevin Van Den – this is awfully hard always – Kevin Van Den Wymelenberg. So my first objective is to learn how to pronounce his name without looking. Working with Kevin we decided to submit a proposal to this award opportunity and we won it, which was fantastic news for us.

Our objective is to bring energy efficiency out from behind what I call an employment curtain or a knowledge curtain and that is other career technical programs that are similar to ours, not necessarily energy efficiency, but you all know them and they are culinary and carpentry, nursing, airplane mechanics, all of those very traditional career technical programs are areas where our students interface with these career paths on a daily basis. Well, they don't interface with energy efficiency unless there is a need by an institution or city government to conduct energy efficiency within their own buildings and then we're well-known.

And for in terms of what Michael was talking about his program, if something goes wrong with system in a building then they'll call the building operator. Typically that's the only time students that are interested in career options will recognize that there is something else out there besides the very, very traditional ones. So very concurrently to the announcements of this award, the Department of Labor was introducing an Industry Recognized Apprenticeship Program and that is what our award is based upon.

We will be producing acronym IRAP for the Western United States and with the idea of once we successfully get this program underway we will be able to move it throughout the United States, not necessarily managed by us, but we'll be the model for other institutions to pick up the torch and offer this kind of a program throughout the balance of the country. Now the program is two years of commercial building energy efficiency training, a work place opportunity where students progressively earned wages working as an apprentice for an organization that will be 2,000 hours.

Once those two objectives are completed our students will be – our apprentice will be able to sit for the Association of Energy Engineer CEM exam or the Building Controls Professionals Exam, both are ANSI accredited 17024 exams, and that carries a lot of weight in the industry. We are really excited about this program. We think it will help energy efficient – the energy efficient workforce turn a corner if anyone is paying attention to the apprenticeship programs and traditional apprenticeship they are busting at the seams with students.

This has been going on for quite a few years now where apprenticeship programs are really, really full. So that's our program. We're excited. I have a number of colleagues who are also awardees for this and as you noted that we are working with Stacy on her award as well. So thank you very much, Maddy.

Maddy Salzman: Awesome. Thanks so much, Roger. And last, but certainly not least, up next we have Tyler Boyes from the Alaska Housing Finance Corporation. Tyler, are you able to unmute?

Tyler Boyes: Yes. Thank you. I'm Tyler Boyes and Michael Spencer is also here. We're both from Alaska Housing Finance Corporation. And our project seeks to magnify the impact of a tool that already exists through a workforce training and certification program centered around the open source software called BMON, which was created

by HFC through the DOE State Energy Program over six years ago. It's shown the potential to save organization's precious resources through monitoring. BMON collects building data from a variety of sources and aggregates it on a web app that anybody can access to view trend charts and investigate patterns of energy usage.

The data can often suggest retrofit options, but more often it illuminates operational changes that can save energy with virtually no upfront costs. So Alaska is huge and geographically diverse with many communities that are not on a road system. This geography creates huge differences in energy costs with some areas paying three to five times more for fuel and electricity than we pay in the urban center. Even in Anchorage, the urban metropolis that it is, we pay higher than the national averages for our energy, but it's nothing compared to what they pay in the rural areas.

So HFC will create a simple user manual and training curriculum to teach the set up and use of BMON through a scalable training program. And we are excited to partner with DOE and collaborate with some of the others on the call here to move this forward. Thank you.

Maddy Salzman: Awesome. Thanks so much, Tyler, and to all of the awardees who were able to run through in just a few minutes what they have planned for the next three years of workforce development activities. So like I mentioned before, these are all just getting started. So there's plenty of work to be done on all of these, but we're excited to not only make everybody on the call today aware of them now, but if there's ways to collaborate with one another and follow-up with us about what resources are available, we're happy to help facilitate that.

We can move on to the next slide where I want to go into a little bit of the Better Buildings Workforce Accelerator. This is something I'm really excited about. We've talked to some folks who are online today about this, but this is the first time we're going public with the Accelerator announcement, so to speak. You also may have heard Daniel Simmons, our undersecretary for energy efficiency and renewable energy speak about this this morning in the plenary session for the Better Buildings Summit. So this is something we're really excited about being able to launch today. We also have a website that's now live, but I will just go into it before we introduce some of our founding partners.

So next slide. So this came up earlier. You've seen some slides now from Sarah and David describing our major categories of activities based off of the challenges we're seeing in the Building Energy Efficiency Workforce. The major point of this slide is to really highlight the fact that none of this is possible without strong industry engagement and strategic partnerships. I don't – the solution to these problems doesn't become will DOE run all of the efficiency workforce and hires everybody ourselves.

And as much as we want to be able to put training out there, it is the responsibility of the industry to make this actually happen and make young people aware of the career opportunities, connect folks looking for jobs with the educational pathways they need to pursue in order to get those jobs, understand the competencies they need to have and improve their skills and get feedback over time. So really just important for us to acknowledge the key role all of our partners that we're announcing today and into the future are going to play in really making these things happen.

Next slide. So the goal of the Better Buildings Workforce Accelerator is to work with national stakeholders to set and meet their own goals to improve building science and energy efficiency in training in educational programs. We have been focusing on talking to various organizations across the industries that we've mentioned to establish a goal that will help either increase awareness, fill knowledge gaps, or streamline pathways for people working in the Building Energy Efficiency Workforce.

In doing so they will engage in a partner cohort group of folks also working on these issues and achieve recognition from DOE for setting goals and achieving their milestones. Ultimately we think this is a great opportunity to not only work with us, but really work with each other to enable tomorrow's energy efficiency workforce and we're excited to be able to give presentations at future Better Building Summits about the great work that's been accomplished through this effort.

So on this slide and on the upcoming slides you'll see that you can get involved. Like I said, this is our announcement and we have some founding partners, but we are still looking for folks and we'll talking about more of that in a moment. So next slide. So I just wanted to highlight some example work for Accelerator goals either from the organizations that have already agreed to participate or if you potentially represent an organization that maybe is interested in joining yourself.

So the first is really around increasing awareness and we're looking for folks that are interested to reach people, particularly those that are either young or early in their careers or folks that are looking for new work opportunities and find ways to engage these people with materials that are exciting and really showcase the career opportunities available to them as welcoming and rewarding and being key parts of our clean energy efficiency – clean energy workforce really enabling the clean energy future that we're all working toward. We're also looking for partners that will fill knowledge gaps.

So either update existing course materials or expand usage of maybe a really great curricula you already have, but hasn't been taken up by very many participants yet. Then finally streamline pathways and this one is more focused on ways that folks can work together, but really ensuring that we're training people for careers today and educating them for careers tomorrow. What I mean by that is setting students and trainees up for success so that when they graduate from a program or earn a credential they're able to get hired, they have the skills that industry professionals are looking for, are able to follow-up with those students and say yes, they've gotten the skills that they needed and update programs accordingly.

So again, these are just some examples, but the types of activities we're really excited about. Next slide. So as I mentioned, we have a new website. We have our Accelerator website on the Better Buildings website overall. So feel free to take a look at the other Accelerators that are active or have taken place, but this is live as of today. You can go to the site and right now it's somewhat bare bones. I'll say that. You can download our fact sheet and download our partnership agreement to get involved and see our current founding partner list and get updates to follow progress, but this will also be a place where we post more content in the future, talk about folks that have been able to meet their milestones, provide links to other resources, et cetera.

Next slide. Great. So I'm really happy to showcase that these are our founding partners that have committed to working toward some measurable goal in this workforce development space. I'm happy to say that these partners have goals in place that they worked with us on to reach a combination of over 20,000 professionals over the next three years with over a dozen new and improved efficiency trainings and curricula. So that's I think really exciting. We're excited to have more people, but even just realizing

that maybe any of us could only reach some small number, working together we can do a whole lot more.

I do wanna give an opportunity for some of these partners to introduce themselves. So hopefully they are prepared and ready to unmute as needed. Up first we have Maddie Koewler from NASEO. Maddie, are you able to unmute and say hello?

Maddie Koewler: Yes. Hello, everybody. We are very excited to be a part of this. From those of you who don't know, NASEO is the National Association of State Energy Officials and we are the membership organization for all of the governor appointed energy officials in the states, territories, and the District of Columbia. And NASEO has been working on workforce issues for quite some time. For the last couple of years we've co-produced the U.S. energy and employment reports, which hopefully you've all seen and took a look at, which covers demographics and technologies and different occupations across all aspects of the – many aspects of the energy sectors.

But for the purposes of this Accelerator we're gonna be focused on our membership with the energy offices. And they are very interested in understanding workforce development opportunities and ways to spark job creation, especially as we are all attempting to recover from COVID unemployment. So NASEO, we are committed for this Accelerator to document work that has been done, work that has been attempted from state energy offices on workforce development and then to understand what worked and what didn't and then to share the results of that an Accelerator platforms and NASEO's own platform.

And something I'm particularly excited about is I will be working with NASEO's equity task force to understand how these issues overlap. So yeah. Like I said, we're really excited to be a part of this, excited to be a founding partner, so to speak, and looking forward to hearing from everybody else. Thank you.

Maddy Salzman: Awesome. Thanks so much, Maddie. We're really excited to have NASEO on board. Up next we have Ilana Bowen from the DC Sustainable Energy Utility. Ilana, are you able to unmute and introduce yourself a little bit?

Ilana Bowen: Sure. Hello, everybody. I am from the DC Sustainable Energy Utility, which for those of you who do not know, we actually work with the local district Department of Energy and Environment to, amongst other things, ensure that there are green job career

pathways for local residents. So when we first met Maddy this was all an idea and I'm thrilled to be a part of it.

Our actual program for the Accelerator will actually be growing off an existing workforce development program that we have right now. We've been running the program for around five years. We not only focus on energy efficiency, but also renewable energy pathways as well as sustainability energy pathways. So what we'll be doing for this Accelerator is to really address the issue of career growth and streamlining pathways within the industry, but also for our alumni.

So when we looked at the program what we saw was there was a huge drop off in the alumni engagement piece. So what we're gonna be looking at is how can we engage with the fellow alumni, training providers, employers, industry leaders to make sure they have access to continuing education pathways. Excuse me. My Internet is going out a little bit. Then just to wrap that up, I'm excited to work with all of you. I took a lot of notes *[break in audio]*.

Maddy Salzman: Ilana, it looks like you've been muted.

Ilana Bowen: Oh, sorry. I keep going in and out. So I was talking and now I don't know where I left off. Anyways, we're gonna be working with a lot of you folks especially in the continuing education piece to ensure and identify what are the barriers, challenges, skill gaps, and other areas that we can actually help glow our program. So apologies for taking extra time, Maddy, that my thing was going in and out.

Maddy Salzman: No. That was great. Thanks so much, Ilana. Appreciate you being a part of what we're working on here and we're really excited to work with you guys as well. Up next it would be great to have Aaron Smith from EEBA. Aaron, are you able to unmute and introduce what EEBA will be working on?

Aaron Smith: Yes. Absolutely. Can you hear me, Madeline?

Maddy Salzman: I can.

Aaron Smith: Hi, everyone. Yeah. EEBA is a 39-year-old nonprofit that started in Minneapolis. We have a community of over 50,000 builders and their partners. Our goal is to help builders and their partners thrive and we do that through creating an environment where we can drive market transformation by allowing them to learn, share, and collaborate. We've had some great education sessions that we've

developed over the years that I think are pretty renown from HERS associate to houses that work, high performance HVAC.

We have a site supervisor to designation, a high performance home builder designation, and a zero energy performance home designation. Our goal with the program and through COVID is like many of you. We've had to pivot to online and digital. I would say in the old model we did regional training events. We did our national summit. Our summit in September was supposed to be in Denver, but we'll now be going virtual. What we've found is this is really allowed us to expand our outreach. So we're creating an interactive online platform for everywhere from high school students to trade school students to existing builders to come and learn and get educated. So we're excited to be a part of the Better Buildings Workforce Accelerator.

And then I think the other part that we wanna make sure and cover and that's so important is that diversity in minority inclusion and outreach with these programs as well. And by going online that's allowed us to create – we've always had an EEBA next gen scholarship committee. We've partnered with Solar Decathlon in the past to bring their folks in, but we want to broaden that massively and really live our mission of driving market transformation at scale. So thank you, Madeline.

Maddy Salzman: Awesome. Thanks so much, Aaron. It's great to have you on board. Yeah. It's been – I'll just mention it's been really awesome talking to great leaders across the country in this space and better understanding not only what projects they already have going on, but also finding all the ways that our interest are aligned and that we can work together and hopefully DOE will be able to provide technical assistance and ways that we can facilitate achieving these goals even faster. So thanks so much.

Aaron Smith: Thanks for having me.

Maddy Salzman: And last, certainly but not least, we have Holly Carr, one of my colleagues here at the U.S. Department of Energy who manages the Solar Decathlon program. Holly, are you able to unmute and talk a little bit about Solar Decathlon schools?

Holly Carr: I am. Hi, there. Can you hear me okay?

Maddy Salzman: We can hear you.

Holly Carr: So I'm Holly Carr with the Solar Decathlon and one of the major reasons that we have the Solar Decathlon here at DOE is to build up a workforce of building professionals who are able to design and build and go out there and advocate for with clients their zero energy designs, their highly efficient buildings with integrated renewables.

So a part of our program has always been a building science education component where our collegiate participants, our collegiate teams in the Solar Decathlon complete building science modules that support the architecture engineering curriculum that they are already pursuing with their university programs. If they're already – if they already have a solid foundation in building science they don't need to double up on our program, but generally our student teams tend to take advantage of this curriculum.

So what we are working on with Maddy and her team is updating and improving the curriculum that we've offered to our students and really putting a nice platform together that is useful not only for our Solar Decathlon teams, but is also open and available to the public. So we're expanding who can take advantage of those materials.

Maddy Salzman: Awesome. Thanks so much, Holly. It's great to have you on board as well. One thing I'll mention here that relates to one of the questions that came in and I'll mention again that if you are on Slido you can submit questions in the workforce meet-up room. One question was about how the Accelerator relates to the Better Buildings Workforce guidelines and I think broadly how it relates to a lot of the activities DOE has had going on in this space, we absolutely want to leverage the existing programs and resources that are available.

So the Better Buildings Workforce guidelines are resources that DOE has worked on over the last couple of years and I think any organization that has goals to better leverage those resources or ensure more students and trainees have access to programs that follow those guidelines and resources I think would be a great fit for this program. But similarity they're like Solar Decathlon and the Better – the Building America Solution Center and other resources that we've had that we wanna make sure people are able to connect the dots on and fully take advantage of.

I think a big component of this Accelerator is making sure people are fully aware of the resources that are available and if there's any ways we can help people leverage those things and improve upon

them, that's great. I also just wanted to mention those are the folks that we had prepped to give an introduction of their plans, but they are not the only people with impressive plans that have chosen to participate and work with us. Many of these groups are focused on expanding whatever green or sustainability focus curricula they already have both in terms of improving the content and increasing the uptake within their organizations. I think there will continue to be a ton of resources available that other folks will be able to leverage as well.

We can move on to the next slide. So in case you haven't felt recruited enough yet, we want to work with you if you are not yet involved, but would like to be. You can send an e-mail to BBWorkforceAccelerator@nrel.gov. You can also check out the website where you can see the fact sheet and partnership agreement and fill out the form. We do have a little bit of a back and forth to agree on making sure goals are well-aligned with the program, but there's a lot of different types of organizations that we're interested to work with.

So we've highlighted a few here, education providers and training organizations, accreditation bodies and trade associations, and awareness building organizations. So we are continued – we have continued interest to work with these types of folks or if you have something – if you don't represent an organization like this, but have things to bring to the table we're happy to talk to you as well.

Next slide. So I'm gonna turn it over a little bit to some questions that are going to appear in Slido and Sarah Truitt might help me out here as well, but we will open Slido. So if you don't have it up, I don't know why you wouldn't at this point, but hopefully you can bring it up on your phone or an Internet browser. But we will open up some poll questions. We wanna hear from participants what are the biggest challenges and barriers you think facing the Better Buildings Workforce today. This is open response. If you agree with one of the things that we've highlighted so far, that's great. If you think there's something we've missed we're interested to hear that as well.

So I will let people think for a few minutes about what to add. All right. Got a whole bunch at once. Awareness to those who do not know, consisted funding for broad training, diversity and minority outreach inclusion, recruiting young people, lack of curriculum universities. I am seeing quite a few things here that are things we've brought up. I'm trying to scan quickly if there's other ones. I might be getting background noise on somebody. If folks can

remember to mute, that would be great. Trying to see if there's any on here that we haven't totally brought up yet.

I think funding for the national programs is probably one that we don't highlight super specifically. University level programs, getting younger people interested in construction and STEM. Immigration to increase number of workers, important point. Making construction sexy, I know that comes up sometimes. Awesome. Yes. I think it's important for us to recognize here what are the things we can help impact especially when a lot of us put heads together. The goal here is to – I think there's a lot of problems or system wide issues where we see – a lot of people feel like they can make some small difference, but maybe not fix the whole thing.

I think one big goal of Accelerators in general, and especially this one, is that when we bring a lot of people to the table we can all move a little bit and that little bit can end up making things work a lot better overall. So yeah. This is all great to hear from folks. All right. So we will move on to the next poll. Poll number four. Who should we try to work with to solve these problems collaboratively? You've seen the folks that we've been working with so far and that we're launching as founding members of the Accelerator. Everyone, that's a good answer.

Sometimes I have a great team of people that we work with here, but there's probably no shortage of people we could have working on these issues. University campuses, ACTE, unions, employers, DOE's Weatherization Assistance, school counselors. Awesome. I hope if any attendees represent these organizations you are seeing this as a nudge to maybe get on board. We'll be happy to have you and I think there's a lot of organizations that have sincere potential to have a huge impact across the board here. We can make it happen. I'll leave this open for a couple more minutes in case people have other ones.

ASHRAE. Somebody mentioned ASHRAE. ASHRAE is also actually is a member, which is exciting of the Accelerator and they have plans to train I think up to 5,000 people on high performance buildings. So that's great. NAR, that's a great one to bring up as well, the National Association of Realtors. Corporate sustainability and marketing agencies, great. Community colleges and four year colleges. Yes. No shortage of people to work with on these things. So if you are interested or if you want to nudge somebody to participate, please feel free to put us in touch. All right.

We will go to the next poll. All right. So if you are potentially interested in joining the Better Buildings Workforce Accelerator, which aspects of joining are most compelling to you? For us this is just interesting because we have a lot of things we want to offer through this program whether it's meeting and hearing other people and organizations working on these issues, assistance reviewing and developing curricula from building science experts. Help articulating my goals and steps I can take to get there, we're happy to play that role. Gaining general awareness about the workforce and what – maybe what other folks have going on. Access to technical experts and something else.

I know for this other you can't enter what that is, but if you have other ideas about what types of support along these lines could be provided through the Accelerator, we're happy to hear that as well. It looks like the runaway winner right now is meeting and hearing from others working on these issues, which we agree. I know that's been a big exciting part of what we've been working on and yeah. It's been awesome from just my perspective to better understand what folks are already working on and talking to them about what's next and how can we help you get there.

Awesome. So thank you so much for participating in these polls. It's really helpful feedback for us to better understand how you guys are all seeing these issues. I do want to answer questions whether for me or for – if there for specific folks that presented today we can direct them as well. So some questions I'm seeing. I already answered I think the one about Better Buildings Workforce guidelines, but if that person has more follow-up questions or ideas about how we could better leverage that resource, I think that would be great to hear.

"What if your organization already has existing goals targeted at increasing awareness, building knowledge gaps, or streamlining pathways?" That's a great question. We are happy to work with you on those, frankly. Many of the organizations, I think especially more of the smaller nonprofits of things maybe already have these goals, but see a lot of benefit to working collaboratively with others in this space. So if you can see a benefit to doing that we are happy to have you on board. I think most of the time we've gotten goals from people. We've usually had a conversation about what other goals could help them or milestones could help them achieve those goals. So it has been a bit of a back and forth, but hopefully all in the spirit of achieving these things together.

"Is BTO collaborating with DOE's Weatherization Assistance Program?" Yeah. So we do talk to them with some frequency. Overall they are not members of the Accelerator as of yet, but they'd be welcome to join. I think if folks on the line had ways that they think that partnership would be best articulated or what goals would be well-aligned, we'd be interested to hear that. There are some questions about what organizations are not involved or why people are not involved. Because this is the founding members and we're actively recruiting still, there's no reason, so to speak, that anybody's not involved and they are more than welcome to join. We're interested in having the Weatherization Assistance Program BPA, HBCU participation as well. I think these are all gonna be fantastic potential partners.

One person asked if other folks are able to help pilot curricula developed by the ABC awardees. So maybe they are able to pipe in or chat if they feel strongly one way or the other, but in so far as their statement of work priorities and objectives allows for it. I think they are happy to work with folks on piloting their programs. I'm trying to see if there's others. If there's other questions people have, feel free to submit those. Another question came in about posting the poll answers on the website. I believe we will be able to do that since the whole webinar is recorded and will be posted on the website as well.

So at least the last screen should be available, but we might be able to give more information too. "How are EPA and DOE leveraging Energy Star to support workforce development?" It's a great question. I know at minimum it's a great way that the U.S. energy and employment reports distinguish workers on energy efficiency versus workers in the sectors overall. They talk about traditional HVAC installers versus Energy Star equipment HVAC installers. So at the very least it's a great way to help understand the scope of the workforce today. But I think there's probably more we can do there.

So that question was submitted anonymously, but if there's more we could or should be doing and partners we could be recruiting to do that work, I'm excited to hear more about it. Awesome. Well, it's great to hear from folks and thank you all for participating. I'll stay on the line if more questions come in or if folks have things to add, but I do wanna highlight a couple more things before we sign off. So up next slide we have a highlight of our Better Buildings Summer Webinar series and we'd like to invite you to attend these webinars that will be starting in July. We've had to consolidate many sessions into the virtual format for the Better Buildings

Summit this year, but we do wanna highlight some of the great work our partners have been doing.

Partners will discuss some of the most pressing topics they're facing and share best practices and innovative new ways to approach sustainability and energy performance. You'll just have to go to Better Buildings Solution Center and click on the 2019, 2020 webinar series. Then on the next slide I think we barely have time for a quick solution center video that Alison can share. I'll just say that the solution center has over 2800 solutions. I hope you find proven and cost-effective energy and water efficiency solutions.

Check out the video to learn more. And I'll just say with all of this, I'd like to thank our speakers, award winners, and Accelerator partners for taking the time to be with us today and if you'd like to learn more about the resources we've discussed, feel free to reach out to me via e-mail, reach out to the Accelerator e-mail, or look at our website to learn more. So Alison, you can queue up the video.

[Video playing, 1:26:32 to 1:27:21]

Awesome. Thanks, everybody and with that we will finish, I think, just right on time. Again, here are e-mails for folks you heard from today on the DOE side and we are happy to connect you guys to other folks who spoke as well if desired. So thanks, everybody.

[End of Audio]