

Maddy Salzman: All right. So we will get started. Thank you, everyone. Hello and welcome to the 2020 Better Buildings, Better Plants Summit, a Virtual Leadership Symposium. We're really excited to be able to be with people at least virtually this year and I think we have a great presentation going on for all of you today. We can go to the next slide.

So as I said, thank you for being here. We have a wonderful session today prepared on building a clean energy workforce. Before we dive in I do have a few housekeeping points I just would like to cover. First off, 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.

Next, attendees are in listen-only mode, meaning your microphones are automatically muted. If you experience any audio or visual issues any time throughout today's session please send a message in the chat window located in the bottom of your Zoom panel. That panel we'll use for technical support and so that will be the appropriate place to do that. Next slide. So there's a picture of me. Hi.

I will be moderating today's session. My name is Madeleine Salzman. Just some quick information about myself. I am a management and program analyst at the Department of Energy in the building technologies office. I've been with DOE in the building technologies office since 2015 on the residential buildings integration team primarily. In my work I focus on residential energy labeling as well as workforce development activities, which is why we're putting on today's session.

Next slide. So I don't – we've already done number one, the introduction and housekeeping. I'm going to do a little bit of an intro, just very quickly. We'll also want to ask you guys some questions through Slido, so we'll discuss that, but as quickly as possible we'll turn it over to our guest speakers who I'll introduce in just a moment, and there will be plenty of time for Q&A at the end. So we'll frame up how to submit questions so that they can be answered later on.

Really quick, we also hope that you'll join the conversation on social media. We're using the hash tag #bbsummit2020, and you can see our Twitter and LinkedIn handles right here. All right. So we're excited that today we're using an interactive platform called Slido for Q&A and polling. So if you go to www.Slido.com either

on your phone or computer you can enter today's event code, which is #bbsummit. Once you enter the code you just select today's session which is Building a Clean Energy Workforce, and in that session you'll be able to submit questions that we can then all see as the moderator and panelists and help answer questions, and there will also be polls which we'll actually start on the next slide.

And we do want to better understand who's here with us today, so that will be a great tool for us. Also, if you had the chance to download Slido on your phone as an app that for me is the easiest way to use it. So I'll give everybody a moment to open up Slido and we will go to our first poll question. Oh, and people are already answering. Awesome.

So, poll number one. What area best describes your role or your organization's role supporting the building energy workforce? So it makes sense we have a bunch of other. We used the same question in our workforce meetup yesterday, so I think more folks were centered on workforce. For me, I'll do policy and program management, which appears to be a solid chunk of folks.

But we do have quite a range, which is great. And I'm curious who's in the other category. Maybe folks that are mostly interested in these topics but don't necessarily work on them themselves. And we'll just – it looks like results are still coming in so we'll just give it another 10 seconds or so. All right.

Awesome. We will move onto the second poll question. And this one is open response, so whatever you write in will appear here. What workforce topics and challenges are you most interested in? And it can be in general or for topics today, and we will try to tailor presentations accordingly. We have two votes for equity right now. Awesome. Very important one.

Rural workforce development, working from home, safety, diversity, professional development, advanced air sealing, new entrance into the field. Lots of good stuff. I know I'm not able to read all of them right away, but we will store these and I will use these to help ensure we ask questions of our panelists that will help address these issues. So again, we'll leave this for a couple more seconds. Livable wages, sustainability training, COVID-19, new solutions.

Lots of really good ideas and lots of big questions for sure.
[Laughs] Awesome. All right. Let's do this. I like that. [Laughs]

So next we will – thank you so much for answering those poll questions, and as I said, it's just really helpful for us to get a better understanding of who's in the audience here. We can see, you know, 275 people but *[laughs]* just to understand the issues that matter to you guys. So, great. So really quick I did want to provide a little bit of an introduction.

As I said I work in the building technologies office at DOE which is a one of about 11 program offices within the Office of Energy Efficiency and Renewable Energy, and I wanted to start big here. The mission of EERE – this is actually just pulled from our website – is to create and sustain American leadership and the transition to a global clean energy economy. Its vision is a strong and prosperous America powered by clean, affordable and secure energy. And, you know, I think it can go without saying but it's worth saying; workforce is vital to making any of this vision happen.

If we do not a strong and knowledgeable and diverse and productive workforce that is capable of designing and building and maintaining high-performance buildings this challenge – this challenge is already incredibly difficult and it just gets harder if we do not have a strong workforce to work with. I think we all recognize that in the Office of Energy Efficiency and Renewable Energy and it's been really exciting to be a part of figuring out what our strategy needs to look like here. All in all, the Building Technologies Office tends to focus on technology R&D.

You know, we work on improving the efficiency and performance of lots of – almost every technology that can be found inside homes and buildings, and not only have we worked on technologies today but technologies of the future. We have lots of current projects going on that may sound out of this world today, but in 10 years we will need a workforce that's capable of taking those technologies, installing them correctly and making sure they're doing the best they can for consumers. So I think our strategy is vitally informed by not only the work we do but also by our stakeholders.

So whatever you hear today or if you're excited to involved with us we want to hear from you, we want to better understand what things you'd like to see us working on. Yeah. I'll also mention, of course, the coronavirus pandemic has obviously had a dramatic impact on our workforce overall across the country and world, but in particular the efficiency and clean energy workforce as well and that is something we'll talk about a little bit later. Next slide. So

just to give a little bit of an understanding of the ways that the Buildings Technologies Office sees ourselves participating in this space, we have kind of three buckets of what I call mechanisms of how we work on these topics.

So the first one is analysis for strategy development. There's a picture of a report that Sarah has helped put together, who will speak in just a moment. So that'll be great for her to cover. And really this is us working on the framework of what does the workforce need and what are trends and challenges, what are ways that the government can be effective in helping address these challenges that currently exist? The second mechanism we have is research and development funding opportunities.

In yesterday's workforce meetup I talked about two funding opportunities that were recently announced. One was last year and then another one was a few months ago, so you'll be able to review the recording if you're interested to hear more about those awards, but yesterday we ended up kicking off our advanced building construction workforce awardees. So there were five projects that were awarded to focus on workforce development, so definitely recommend checking out the recording for yesterday's session if you missed it to hear about what those projects include.

And then our third category for how we kind of work on these topics is industry and stakeholder partnerships, and along with the advanced building construction workforce awards kickoff yesterday we also announced our new Better Buildings Workforce Accelerator, which again I'm really excited about. I think it'll be a great opportunity for us to continue working with folks in this space and better understand the issues facing industry and stakeholders across the country and working with folks on addressing these problems. So as I mentioned, first one Sarah will talk about in just a moment as part of the session.

The next few are ones that we discussed yesterday and will be in that recording. But with that I should be able to turn it over fairly soon. Next slide. So that's enough for me and the DOE side of things. We want to turn it over to some experts in this space. So I'm really excited about our panelists today. We have Sarah Truitt, who I've already mentioned, who I work closely with on our strategy development.

Sarah works for the National Renewable Energy Laboratory. After that we have Dean Stanberry from the International Facility Management Association or IFMA. And then last but certainly not

least we will have Phil Jordan from BW Research. Thank you from me to you so much for being with us today. It's really great to have the three of you here. And we can go to the next slide.

So up first, as I mentioned, we will have Sarah Truitt speak on the work she's been leading at NREL. Sarah joined the National Renewable Energy Laboratory in 2010 and supports the Building Technologies Office tech to market portfolio as well as, of course, our workforce development efforts. So Sarah, I will pass it off to you.

Sarah Truitt:

Thank you, Maddy. Hello, everybody. Thanks for being here today. First we need to talk about who are we talking about; who is this building energy efficiency workforce? And part of the difficulty is just defining what workers we're talking about. So for the purposes of our background research we are looking at the entire pipeline of workers who are involved with both energy efficient technologies as well as building high-performing buildings.

So that could be research, manufacturing, architecture, design, engineering, construction and facility management, and then all of those other support services that have to be somewhat knowledgeable about energy efficiency to make all of this happen, so that could be real estate, you know, mortgage lenders, those other types of professional services. So these all come together to make energy efficiency and high performance buildings possible. I mentioned it's difficult to measure. That's because most people don't identify as an energy efficient worker.

They identify in one of these other job sectors. So in 2016 the Department of Energy Building Technologies Office sponsored a report to start collecting data on this subset of each of these sectors, and that has been going on now for about four or five years and it's called the US Environment and Energy Report. So I rely very heavily on that report for a lot of this background research. You can go to the next slide.

So as I mentioned, we did a background research paper. It was a pretty extensive literature review and some interviews with subject matter experts and there are a number of challenges associated with this sector; low awareness and interest in the sector. There's a lot of different ways you can get into the sector and that can be confusing for folks. It's great to have a lot of options, but if it's not apparent which path to take then it can act as a barrier.

The construction sector in particular has lagged behind in productivity from other industries. The energy efficiency sector and the construction sector are not very diverse and it's difficult to hire in this sector, so folks – we're going to get into this a little bit later, but without proper training we're wasting a lot of energy in buildings. PNNL has found that up to 30 percent of energy is wasted just through improper maintenance and installation alone. So you can go to the next slide.

So Maddy, of course, addressed COVID-19. The Building Technologies program is looking at the next decades to come, and so we're still relying on the pre pandemic statistics to guide the strategy, and these are some stats from the end of last year. New housing starts in the US are expected to grow to be 40 percent higher in 2028 than they are today, and just to give you an idea, you know, we have a severe housing crisis, we still have that, and we are forming about 200,000 more households each year than we have housing to actually house, and so we're behind in that. The United Nations predicts the square footage of New York City would be constructed globally every month basically for the next 40 years, and sustainability is still a strong trend that we're seeing that people are interested in.

So you can go to the next slide. So buildings and consumers are changing. Technologies are enabling buildings to be more efficient in everything they do. Buildings are becoming more interconnected with distributed energy resources and electric vehicles and interacting with the electricity grid itself. Consumer preferences are shifting as well. A Gen Z, which is now our largest generation, the youngest is eight or nine right now, they are very, very climate conscious, and this quote on the bottom of this slide is from the Associated General Contractors of America.

If you can't read it, it says, "Gen Z is known for being mindful and health conscious. They'll actively seek opportunities to reduce their carbon footprint." So they're going to expect these types of features built into their homes and buildings. Next slide. So as I mentioned I relied quite heavily on the US EER report, which Phil Jordan, who's also on our panel, was very intimately involved with. As you can see the energy efficiency sector is almost 2.4 million people.

It ticked up a couple percentage points from 2018. On the right I've noted what is included in this sector. This is straight from the report here. As you can see, the large majority, I think is 56 percent, of the total works in the construction sector. So this means that these folks in construction are spending most of their time on

high-performing buildings or energy efficient technologies. You can go to the next slide.

So hiring is difficult across the energy efficiency sector. I wanted to compare that to the construction sector in general, and what's interesting here is that if you look at the construction sector within energy efficiency and these three different construction sector surveys on this table on the right you'll see it's more pronounced in the energy efficiency portion of the construction sector, which makes sense because people need higher skills for that job. So you can go to the next slide. So here are the reasons cited for hiring difficulty; lack of experiencing, training or technical skills, a small applicant pool and difficulty finding industry-specific knowledge and skillsets.

Now this is from the latest US EER report which came out, I believe, in March or April of this year. But the results of an untrained workforce are efficiency – installations that are slow and expensive and low performing and, you know, we just won't meet our potential that way, and it's damaging to the industry to have these efficient technologies not performing at their best. And the reason we need to address workforce is so that all of those benefits can be realized. So, next slide.

So how are we going to address these hiring challenges and what can the Building Technologies Office do about it? So we're looking at those top three reasons. The lack of technical skills, of course, the buildings program can help educate and improve skills and that's part of what our Workforce Accelerator is designed to do, and we'll talk a little bit more in detail about that in a few slides. Small applicant pool is a problem, and increasing the diversity and actively recruiting from a broader pool of people is really important.

We need the best talent in this industry and we can't do that by not casting a broad net. And lack of industry-specific knowledge. Now there are a lot of green certifications and different pathways into this industry, but as I said, it can be a bit confusing. So streamlining these or clarifying the pathways can help get more people the knowledge they need. So, next slide.

So we looked behind some of the contributing factors to these challenges and one was just low interest and awareness in general by students, and this starts very early on in our educational system. You know, technology is not strongly correlated with construction or the buildings industry. Neither is STEM. So folks might see

something like working in solar more exciting than energy efficiency or, you know, robotics more exciting than construction. So we really need to do a better job making those connections to both STEM and technology, especially as our buildings become more interconnected and more automated there will be more high tech jobs in this sector.

The other issue is that school counselors have traditionally focused on preparing kids for four-year colleges and not as much on vocational pathways, but that does seem to be changing. And this on the right here is an example of a survey that shows that students – a lot of students, most students – are not interested in HVAC careers. That's just an example for you. And next slide please. I'm trying to check my timer just when my phone went off.

All right. So as I mentioned, a lot of pathways. It's difficult sometimes to figure out which one is appropriate for you, which one is high quality, and which one is going to best serve your career aspirations. Next slide. And lack of diversity. So we took a look at the US EER report on the left here. I just circled black Americans and women as two groups that are quite underrepresented compared to the national averages.

So that right-hand column that doesn't have a circle, that's the national averages. So you see for women in energy efficiency there's 24 percent of the workforce measured as women and nationally it's about, you know, 47 percent. On the right here we took a look at construction jobs specifically, and the red lines that go across are the national averages and the bars, the different-colored bars are percentages of folks in those demographic areas. One really interesting thing here is that in energy efficiency it looks like women are much better represented than in the construction sector as a whole, and some of the reason I think that's happening here is that in the US EER they are looking at all of the jobs, including the office jobs and the administrative job, and on the right-hand side the Bureau of Labor Statistics is not.

They're only looking at those specific job sectors. So if that jumps out at you I think that's part of that difference there. Next slide. So we have the opportunity to overcome these challenges together, as I said, in the Better Buildings Workforce Accelerator, and this is a program designed to bring cohorts of organizations together that are working toward the same goals. So you can learn from your peers, you can learn from some of the experts that DOE has access to, and we can sort of lift all boats in this area.

And – so next slide – if you want to get involved there is an email there, BBWorkforceAccelerator@NREL.gov, that you can email and we can get you involved. We are accepting Accelerator partners. I think we already have 12 or so signed up, so you will be in good company. And, next slide please. So here is my poll question for you. I think, Allison, this should go in Slido.

So how can DOE best support the development of this workforce? If y'all don't mind giving us your opinion, this will help shape our activities and where we focus our efforts.

[No conversation from 0:26:17 to 0:26:59]

So it looks like the educational resources are most needed. Peer learning is next and then support from experts at DOE can bring to your projects. Update some of the latest technologies. The email to partner on the Accelerator is BB, like boy, boy, workforce written out and then accelerator written out. So BB Workforce Accelerator at NREL for NREL, National Renewable Energy Lab, dot gov. And is our website up yet, Maddy?

Maddy Salzman: Yes. The website for the Accelerator is up.

Sarah Truitt: Okay. So you could also go to the Better Buildings Solution Center to find the website as well. You should be able to Google that. Okay. This is my last question. I can't tell if the answers are still coming in, but it looks like they've settled.

So everyone can see sort of the rankings. Thank you very much. This is really important for making sure we're maximizing the impact of taxpayer dollars to do this work. Thank you. And next slide.

Maddy Salzman: Awesome. Thank you so much, Sarah. We did have a couple of, I think, clarifying questions that if you're able to answer that would be great, and ones I might be able to help with as well. One question that came in, people were curious about the productivity measurement and how exactly that's being accounted for, what exactly does it mean. So I know you're not doing that calculation, but if you could explain what some other people who are doing that calculation mean by it.

Sarah Truitt: This could be a very long conversation. Okay. Productivity is measured in different ways, and for the past, I don't know, 50 years it's been thought that the construction sector is lagging way behind, they're less productive than they were, you know, years ago. And it

really does depend on how you measure it. So construction sector, until very recently, like 2018, had been lumped altogether, and the Bureau of Labor Statistics has now divided it up into subsectors that are a little bit more representative of how productive they really are.

And so there's actually a really good paper on the Bureau of Labor Statistics' website. It's one of their monthly reports and it's an article about how the older way of measuring productivity wasn't as accurate. So if you look at that it breaks it into single family, new builds, highway bridge, you know, industrial, commercial, and it is not as bad as it has been in the past but it's still not quite up to other industries and could still be better. And of course, when we have a severe housing crisis we need our productivity to increase to be able to help that. So I hope that helps, but there's a really good article on the Bureau of Labor Statistics Department of Labor website exactly about this.

Maddy Salzman:

Awesome. Yeah. Thanks, Sarah. I know part of that question also asked if we were just building fewer buildings, and I do know that the way that this statistic is calculated that would not be a factor. It has to do with the labor hours going in and then the useful product coming out, and there's lots of reasoning and things, and I think one thing that's probably important for us to emphasize is this is not to say that people have gotten worse at doing their jobs or anything. It's that oftentimes these jobs have gotten harder to do and there's a need for digitization and full leveraging of other tools that may be available to kind of keep up as best as possible.

And then one other clarifying question for you before we turn it over to Dean, people wanted to know if the report is available and how they might be able to access it at some point.

Sarah Truitt:

The report is coming. It is sort of an internal document that is going to be made a public-facing document I'm hoping within the next month. And so it'll be on NREL's website in the next month and maybe we can get this registration list and send it out.

Maddy Salzman:

Great. Thanks, Sarah. We have more questions coming in, but I think a little bit less of the clarification variety, so we will move on to Dean Stanberry. Dean is a solutions-oriented facility professional with broad-based experience in facility management, real estate, process and quality improvement, procurement, workplace strategy, program and project management sustainability and climate change. He's an active industry advocate serving in a number of volunteer leadership roles as a member of

IFMA, the International Facilities Management Association, the IFMA Foundation and the US Green Building Council.

He's also the second vice chair elect of IFMA's global board of directors and chairs the Environmental Stewardship Utilities and Sustainability Community and Government Affairs Committee. So with that I will turn it over to Dean.

Dean Stanberry:

Good morning, and thank you Maddy for the introduction. Thank you for getting the first slide up there. So IFMA is a professional association. It's a 501(c)(6), so we exist to benefit members, so that's a distinction that – the while reason for IFMA's existence is to promote the facility management profession and IFMA celebrates its 40th anniversary this year. So we've been working on this for a long time. Next slide.

So we have just over 23,000 members globally in 108 countries. We have regional chapters, 142 of them around the globe. We have industry councils, so these are groups that are organized around industry-vertical segments. It could be banking, manufacturing, you know, government is one. And then we have communities of interest and that's like my environment stewardship community, IT or information technology. These are things that kind of cut across all industries.

So environmental stewardship is something that you see pretty much everywhere. Next slide. So IFMA has a suite of credentials. We have three – two certificates and one credential, so the FMP and the SFP are certificates and the CFM are credentials. And go to the next slide, we'll start working through those. The FMP or Facility Management Professional is sort of our entry level credential – certificate, I should say.

Over 10,000 people hold this worldwide. There's no prerequisites and no renewal costs. You know, it's a tool to learn about the facility management profession. Many of our associate members, so these are people that are vendors or they provide services to the facility management and building professors, will get this credential so that they have a better understanding of the role of facility management. It's something that once you have it you have it for life. We now have digital badging available so that that recognition can be made online, and we've tried to – started updating our program so that you can either purchase as a bundle or individual modules can be purchased so that it can be incrementally earned over time.

Next slide please. The CFM or certified facility manager is a credential. It's competency based. That means that if you've not been working as a facility manager for some time chances are you're not going to be able to go sit for that test and be able to pass it, whereas the other certificates are knowledge based. This is sort of the highest industry standard that we have – I hold the CFM myself – and it requires sort of ongoing professional development, so you do have to renew the certification every three years.

So it is a validation that the person holding this has experience with FM and demonstrated industry expertise. Next slide. And most relevant to today's discussion is IFMA has a sustainability facility professional or SFP certificate. We put this together several years ago in recognition that operating a building sustainably was not a competency that many people had. We're producing all these LEED-certified buildings, but if you don't operate it sustainably, you know, it's not going to stay that way for very long.

There's kind of a famous little pie chart that shows the lifecycle cost of a building that only 3 to 6 percent of that cost is in its initial design and construction and the rest of that cost is in its lifecycle operations, so if you don't have somebody that understand how to operate the building sustainably you're not really going to get the full benefit of having a LEED-certified or sustainably-designed building. So the SFP, again, you have it for life once you get it once you've taken the test. You also get 30 to 70 general CE hours towards LEED maintenance if you do have a LEED certification as well.

I also hold the LEED AP in operations and maintenance, but what I'll tell you is it doesn't teach you anything about operations. It teaches you how to certify a building. So that's another reason why IFMA focused on the SFP, is that it is focused on the individual and teaching them the skills they need to operate a building no matter where they go in their professional career. Next slide.

So we think that professional development matters, that you've got to really learn at every stage of your professional career. Facility management has been called the accidental profession, and if we had more time I could tell you exactly when my accident happened, but it's something that people did not know about. Certainly you didn't hear about it in high school or in college. IFMA does have accredited degree programs at universities, colleges and universities around the world in bachelors and master's degrees in facility management, but that's relatively new.

We also are starting to work at lower levels. We're teaching a course we'll describe as essentials of FM down at the high school level and trying to use that as an entry to the profession, getting people interested and tell them what it is. So we need to stay informed because there's a lot of industry trends. I notice some of the questions we're talking about technology and can we get more monitoring and sensors into buildings, and commercial real estate is virtually the last industry to go digital, and so in many ways we're kind of behind the times in trying to get a lot of this technology deployed in buildings.

But more importantly, the people that have to understand and operate that technology are also behind the times. We need to increase the level of knowledge within the entire FM profession. The other thing that we know is that over the next 5 to 10 years 50 to 55 percent of the existing FM professionals will be retiring. I'm in that category. So we know that there's a lot of opportunity there but also we're going to see this large turnover, so we just need to get people who can prove the solutions and anticipate and manage these FM challenges as we move forward. Next slide.

So these are the courses that we have. It kind of talks a little bit more about the number of hours. Essentials of FM is really sort of entry level. It's just a certificate of completion. We are using that in a variety of venues. Here in the Denver, our local IFMA chapter partnered with the city and county of Denver and we put together a youth program where we just graduated six of eight students, so six people completed the source in essentials of FM.

We're happy to say that it was 50/50 male and female and they were all representing minorities. And the city is also paying for paid work experience for these individuals, so they're going to give them 120 hours of paid work experience. We've lined up work opportunities for them. So they're now going to get experience and they will be able to compete in the job market. One thing worth mentioning is that a fully-qualified facility manager typically makes around \$100,000 a year.

So the city was very interested when we started talking about this as a career path because, you know, in construction many jobs are still at the entry level and at the minimum wage level, so even our starting level positions as a facility coordinator is a \$40,000 to \$45,000-a-year job, so it can even start out as a living wage. Next slide. So a little bit on what does this mean. So the average return on investment for individuals with credentials is about a 15-to-1

over five years and it can equate up to a \$6,000 salary increase in the first year, and that's for individuals.

And we look at what's the benefit to the employer. About 74 percent of the organizations reported that their credentialed employees have higher performance appraisal rating, so they're seeing the benefits as well. So we have a couple of papers produced by the association on benefits to the individual as well as benefits to the employers. Those are available on the IFMA Denver – or excuse me, IFMA.org website. You can go to the knowledge library and look those up. Next slide.

So why do facility managers need to care? We're talking about, you know, clean energy workforce. Next slide. So this is another kind of famous pie chart here; buildings contribution to climate change. About 37 to 39 percent of energy consumption that leads to carbon emissions goes – or comes from commercial buildings. So this is in the energy development as well as the energy use. These are all the different greenhouse gases, you know, carbon dioxide being the most prevalent one.

Methane. People don't think of methane natural gas as being a huge issue, but it doesn't last as long in the environment but it actually punches about 20 times above its weight, so it has 20 times higher heat retention properties than carbon dioxide. And then we have some other things like nitrous oxide, which my dentist no longer uses much to my disappointment, and F gases which are fluoridated gases. These are manmade gases. It seems to make a relatively small percentage, but that is a growing percentage because there are a lot more manmade gases today.

These gases unfortunately last for thousands of years in the atmosphere. Next slide please. So IFMA, and particularly my environmental stewardship community, we've put out a couple of reports recently. These are free, available online. This one came out last year about October. It's *Climate Change Fundamentals for Facility Management Professionals*. We took two scientific reports, the IPCC climate report and the government's NCA4, which is National Climate Assessment Report from 2018.

These totaled over 3,000 pages of scientific data. We got it down to about 30 pages of content so it's good, useful information to give you a good background on what climate change is and why we need to care. Next slide. Now once we've kind of scared everybody on the affects of climate change now we can talk about how do we adapt to it? So this report just came out in April, the day before

Earth Day, the 50th anniversary of Earth Day, and it's *Adapting to Climate Change for Facility Management Professionals*.

So this is ways to do climate change – or climate risk assessments for your company for your buildings, and then depending on what risks you have, what are the resources available to either mitigate, work around those risks; you know, what are the possibilities to make a change? Again, this is about a 30-page report, free to download. And, next slide. I like this slide. I use this on my climate change presentations, you know, because we talk about start where you are, use what you have and do what you can.

We don't expect everybody to become climate change experts, and in fact, most of the climate change experts will say they don't even really care whether we convince individuals to recycle because that's not where all of the big changes need to occur. The big changes need to occur in fossil fuels and other areas like that. So your world does depend on it. Another statistic that's out there, I think Sarah had one about the number of people working in clean energy. I have one that says there's approximately 11 million people globally working in the renewable energy sector.

Now that sounds like a lot, but what do we have? Something like 9 billion people on the planet? So proportionately speaking 11 million is not a lot of people working in renewable energy to help us save the planet for us, so we need a lot more people working in these areas, whether it's in renewable energy directly or working in facilities in how you're going to manage your buildings and make them more efficient going forward or in the sciences where you're going to be coming up with these new technologies which are also going to help us reduce footprint over time. And that's it for me.

Maddy Salzman: Awesome. Thank you so much, Dean. Great presentation and awesome to always hear more about your programs at IFMA. Just a couple of clarifying questions that came in from folks. One person asked what is the role of efficiency or sustainability in the standard CFM course, if any?

Dean Stanberry: So IFMA has 11 core competencies, and one of them is sustainability. So we do think of it as a core competency. It's a strategic theme for the association, so we put a lot of investment into that. It's definitely taught as one of our competencies and a lot of emphasis.

Maddy Salzman: Great. And one person was curious what the difference or similarities are between the IFMA management professional or

potentially different credential and then building operator certifications or how those are connected.

Dean Stanberry: Yes. So we actually work with the building operator certification group. The subtle difference there is that building operator certification is more for what you would consider the maintenance technicians, the people who are out doing the work on HVAC systems, plumbing systems, electrical systems. Facility management we considered to be more of a business profession. It's not a wrench-turning profession. We have another slide that's available where we actually kind of map out all of the pathways from all of the different trades and skills that lead up into facility management and other professions.

So a facility manager may come up through the HVAC pathway, if you will, but once you become a facility manager you have to develop knowledge across all of those trades and skills because you touch every one of those areas because you're managing all of that, from cleaning to workplace wellness, design and construction, renovation. Facility management I describe as a – it's really project management but it's a project that never ends.

Maddy Salzman: Yeah, yeah. Absolutely. I think that helps deliver clarity for people for sure. And then clarifying question; are IFMA courses available for states to provide for facility managers?

Dean Stanberry: Yes. IFMA courses are available to anyone. You do not need to be a member of IFMA to take the courses or become certified. In fact, the FMP and the SFP are ANSI-certified certificates – you have to say that real fast.

Maddy Salzman: *[Laughs]*

Dean Stanberry: And so in order to provide those kinds of ANSI certifications, you know, you cannot put constraints on it. So they are available; however, if you are an IFMA member discounts are available there as well, so there's other advantages to being a participant in the organization.

Maddy Salzman: Awesome.

Dean Stanberry: Another – just a quick point around that, we did get our own Bureau of Labor Statistics standard occupational classification in 2018 that one did not exist for facility management before that. And also in 2018 we released our ISO standard. There is now ISO 41000, which is the international standard in facility management.

Maddy Salzman: Awesome, awesome. Thanks so much, Dean. Other questions flowing in quickly but I'm going to make sure we turn it over to Phil because I want to make sure we have time for all questions at the end. So really quickly, Phil Jordan is the vice president of BW Research partnership, leading the firm's Massachusetts's office. His work focuses on the impact of talent on economic prosperity and sustainable communities and his personal passion is developing solutions that provide expanded opportunities for the most difficult-to-serve populations.

He has extensive experience studying the innovation economy, in particular clean energy and ICT, has authored dozens of reports including for NRDC, NREL, Solar Foundation and statewide clean energy studies. So I will turn it over to Phil for his presentation.

Philip Jordan: Thank you, Maddy. Thanks to the other presenters for your really interesting talks, and I'm seeing a lot of great questions and comments coming in and looking forward to the conversation that will unfold after this. I'm going to be fairly brief I think in these remarks because what I hope to do is to put a little bit of context around sort of the numbers that we've seen in a lot of the reports, some of which, you know, the ones that we've worked on that Sarah mentioned in particular, the US Energy and Employment report, which did come out this year in March, and to think about those numbers in the context of the moment that we are living in currently with COVID-19.

I also hope that we can have a good and healthy and lengthy discussion following the remarks on some of the very important issues of equity that were raised by the previous two speakers and by many of the panelists today because I think we should be cognizant of that moment that we are in as well. Before I get into the COVID-specific data, I did want to just throw out a couple of datapoints for you. So according to the US Energy and Employment report, which we worked on initially starting in going back to 2015 with the US Department of Energy and Bureau of Labor Statistics and now with NASEO and the Energy Futures Initiative but with support from DOE, so thank you, there are 3.3 million jobs in the clean energy sectors, as Sarah referenced, about 2.4 million of those in energy efficiency.

For clean energy jobs overall that was an increase in 2019 of about 70,000 new jobs, which is about 2 percent growth. The growth rate is 6 percent over two years, which is far exceeding the national average. You know, as I mentioned, energy efficiency is the

biggest sector and actually is the one that's had the most consistent and least amount of volatility over the years. I will just note that on the diversity question, as Sarah referenced some of the differences between energy efficiency overall and energy efficiency in construction, when we look at the other segments outside of construction and energy efficiency we find better representation, particularly of women and also of African Americans in the energy efficiency sector with utilities being a notable bright spot particularly for women and black Americans, which is encouraging because the pay and job quality in those segments are quite high.

So there are some interesting perhaps lessons that can be learned from the utility experience and sector. So we had this fast-growing, large industry, lots of excitement, high levels of optimism from employers who were surveyed and interviewed in the fourth quarter of 2019, and then COVID strikes. So if we go to the next slide here we can see that the unemployment rate has skyrocketed. 40 million unemployment claims since March. I know that Friday we had a better-than-expected jobs report.

I would just remind everyone that the day before the number of new unemployment claims was three times higher than the highest month we'd ever had before March. So the damage from COVID-19 on our economy is only starting to be realized now, and while the 40 million unemployment claims certainly represent a significant number of jobs where the people are out of work because of a forced closure, right, for safety reasons where there was no place to go to work so a person could not go to work, the idea that we are going to V-shape recover from a jobs perspective back to where we were in February is extremely unlikely. And the numbers that we've looked at we think generally for the economy pretty unlikely that we would see single-digit unemployment levels throughout the balance of 2020.

To put that into a little bit of perspective, there have been 11 months cumulatively since 1948 where the unemployment rate in America has exceeded 10 percent – or exceeded 9.9 percent, and it's very likely that we will have 11 consecutive months at that rate, so this is the worst – I mean unless you're 90 years old plus this is the most significant economic downturn of most Americans' lifetime. If we're lucky, I think, and if things go well, it'll be only about as bad as the great recession, and pretty much everything has to go right for that. So, that's a lot. *[Laughs]*

Why don't we go to the next slide since that's pretty terrible overall for the economy, and of course what we've seen is that a lot of

those jobs are in leisure and hospitality, so when we think about jobs at restaurants and bars and other dining establishments that was nearly 60 percent of all the jobs that have been lost over March and April and you can add another 13 percent when you put in accommodation and travel. So nearly three quarters of all the jobs lost were in these sort of very discreet sectors. But what we're seeing over time is that actually the energy job situation is – the energy impacts is significant and growing over time.

So we see elimination of five years of industry growth of all the new jobs created over five years. We know that there's a lot that is not included in the data, right? So in addition to the job losses that we're referencing, you know, we have reduced hours that are not captured in the data, reduced wages which are not captured in the data, and then by the Bureau of Labor Statistics own admission there are a lot of unemployment claims that aren't actually included in the report because of the difficulty in collecting data during this time. We're seeing a decline in energy demand. That decline has continued.

And even in places like Wuhan the demand for energy is only up to about 92 percent of what it was pre crisis and there's several months ahead of us, and have a lot of tools in their arsenal to get things moving again. In the oil sector, I mean we all know about storage nearing capacity, we know about the negative oil prices that occurred, and we see that perhaps this was a little bit aggressive to be on track for energy wide to lose 1.75 million jobs; however, we still think that given sort of how this virus seems to be moving and the shocks that are happening to the economy we certainly think that this is still a possibility to lose that number of jobs in the energy sector.

So if we go to the next slide...you know, this is where we see some specific clean energy impacts projecting about a quarter of all jobs to be lost. Again, these jobs will come back to some extent. It will take some time. And some sectors will come back much more quickly than others even without a significant policy intervention. You know, on the renewable side we know that distributed generation, so wind and many of the offshore wind projects, a lot of the utility scale and larger solar projects have continued to pace.

Even rooftop solar seems to be improving prospects as we look further out as many of those jobs can be done with minimal customer interaction or needing to enter into a home. Clean vehicles, on the other hand, this is not a good time for clean

vehicles. Transportation demand is very low. The automotive sector is getting crushed. Inventories are extremely high.

People are holding back on these types of purchases, and with very low energy prices and gasoline prices that always puts pressure on sort of clean vehicles. And then for this crowd, you know, in the energy efficiency space, particularly around the residential retrofits, that's an area where we see continued uncertainty and concern given that regardless of how governments act to open up, residents are still quite hesitant to have people come into their homes. Next slide. So all right, this is the last depressing slide, I promise.

These are the largest – these are the biggest losses. So again, 413,000 energy efficiency jobs lost, you know, to a cumulative of 13.7 percent. We're looking at losses all across the United States. You see that there's really no rhyme or reason to the states that have lost significant numbers of jobs. You can see for Georgia and Hawaii and Kentucky as well, right? Big job losses across all of these – across the entire country.

No place is doing well. They're all significant double digit job losses in energy efficiency, so it's widespread and obviously creating some significant challenges, because as indicated in Sarah's comments earlier these are good jobs, these are good-paying jobs, and so losing these types of jobs in the construction trades, in engineering, in manufacturing, are a real challenge to our economy. Next slide. And I think maybe this has some bullets that will drop in, but I want to leave us on some good, positive notes here and think through sort of how can we deal with this crisis?

Well, the way that I think about this is that we have this period of time pre vaccine, and whether that's the end of the year or the first quarter of 2021 or the end of 2021 you'd have to talk to an epidemiologist or virologist to figure that out, but what I can tell you is that there is some positive steps that we can take to deal with this crisis. So one is that we can start thinking about moving out of or shifting away the resources from disaster recovery, which is really helping to provide cash to individuals to sort of make it through, whether that's enhanced unemployment benefits or PPP in particular and start thinking about how we can make targeted investments to safely get people back to work. So one of the things that we know about clean energy and energy efficiency is that it responds very well to stimulus, right?

And while stimulus is certainly a hot topic right now of how much we need and when we need it I think there are some – there's a lot of good evidence to show that stimulus creates lots of jobs in the clean energy sector. So if we go to the next slide I have some ideas for how – that we can think about in terms of stimulus focused around energy efficiency. So first is K-12. In my opinion at least there's no better opportunity that we have for stimulus that could create jobs immediately than focusing on retrofitting and upgrading our public schools in America. They're all closed across the entire country until at least September, maybe longer, and then when they open they're all closed in the afternoon.

Every superintendent in the United States has a long list of projects that are ready to go that have already been specked out that need to be – whether it's new boilers, new windows and doors, insulation and air sealing or other types of energy efficiency upgrades, they've got the list, they've got it specked out, but they just don't have the cash to do it. They also are all facing unprecedented budget crises where state funding for education and in many cases town budgets or city budgets are constrained, and therefore schools know that they're in for a rocky couple of years if there's no additional relief. Saving money on electricity bills can really help those budgets, and the work can be performed by people who are currently being paid to stay at home with PPP.

So the K-12 program is one that I think could be done relatively quickly and efficiently through a state energy plan, SEP formula funding if we plus that up. So I think there's an exciting opportunity for a K-12 plan, and more to come on that from us soon. Commercial office spaces likewise are often vacant or significantly reduced right now in their capacity as are retail buildings. So those three areas in terms of building efficiency I think are really prime for upgrades. When it comes to grid infrastructure, again a lot of the different electrification projects and energy efficiency work requires some new grid modernization, whether it's new switches and sensors or relays, smart meters, et cetera.

These are all things that are, I think, critical upgrades. And again, much of the work can be done outside, much of the work can be done at distance, much of the work can be done while wearing PPE. And then finally, public universities in particular, which are struggling – really all universities, but public universities in particular which are struggling with decisions on whether to open in the fall, especially if there's a delayed opening, but even over this summer we could be getting to work on those public

universities doing similar types of upgrades. So I think the takeaway here is that what stimulus and what policy can do is to help to order and prioritize the work that gets done, recognizing that we have a large group of people who are home, who are out of work and who have significant skills already.

Maybe there are some – obviously in some instances there's some training that needs to happen, there's some management and oversight to make sure that they're sort of cross training across different programs, but the nuts and bolts of the occupation and the skills that exist underlying it are present in a workforce that can't go back out for some time into people's homes, for example, but could be repurposed to be doing that same or very similar work in some of these other buildings. So, you know, I think there is an opportunity here to really make great strides in implementing energy efficiency measures across the US that can also help during this sort of pre vaccine period where there's going to be some level of physical distancing that is going to prevent sort of a full employment in many of these sectors.

So I think, you know, again I know there's a lot of depressing data there about the state of affairs and where we are in terms of economic growth and opportunity, but I would just like to leave us with this hopeful idea that stimulus can work, it's been proven to work, and that rather than just saying we need a massive amount of stimulus to create lots of stuff right now it can be really targeted around getting people back to work safely and doing so smartly. So hopefully that's some food for thought for this group.

Maddy Salzman:

Awesome. Thank you, Phil. Really appreciate the way you've conveyed kind of the important issues that are happening right now and, you know, for this audience as well as just the work that you guys have been doing to make sure that we have this data to begin with and are looking at it carefully. You know, I know you said – you're apologizing for the depressing data, but I think if we're not willing to look at the realities of this situation then we're not going to do a good job of addressing them. So it's important that – the least we can do is at least pay attention.

One thing I'm curious if you have put on, but perhaps others on the panel will also have thoughts. I know you mentioned some ideas around how efficiency workers can get back to work in spaces where maybe there's more opportunity for development and efficiency installations. I'm curious what thoughts you have around – you know, also we brought up – lots of the attendees brought up issues around recruitment and small applicant pools. What are

good ways to be handling that right now? How do we bring people into an industry that's also hurting in this economy and is now a good opportunity for training or does training now need to be online? I'll start with Phil but then if anyone wants to chime in as well.

Philip Jordan:

Yeah, that's a great question. So I think that there are a couple of things for us to think about. So one is that, you know, now certainly would be a good time to think through incumbent worker training, and we have through the Workforce Innovation Opportunities Act mechanisms for doing that and I think there are ways to sort of plus that up and make it more attractive and helpful for employers to be able to administer training to their incumbent workers to upscale those workers and get some of those certifications that have a cost that go along with them.

In terms of new workers, what I hope we will do this time is – and when I say this time I mean somewhat in contrast to what happened with ARRA – is that we emphasize and really think through any investments that get made particularly around infrastructure from the federal government or large state government investments in creating that infrastructure and then recognize sort of when those jobs will be created and coordinate the training a little bit more closely with those deployment projects. You know, so it just sort of depends on what we're talking about funding, but thinking – you know, I don't want to repeat some of the mistakes of the past where we created a lot of sort of, say, short-term solar, photovoltaic installation training and then we sent out those graduates to compete with master electricians who had lost their jobs and had 25 years of experience and could, you know, learn the solar installation techniques fairly quickly given their base.

So I think it's important to think through very carefully about how we emphasize that – you know, who's being trained where, and I would also say that it's a great way for us to think more closely about pathways and ongoing pathways and continuing pathways for people, and I think one that we could really see a lot of improvement currently is recognizing the links of going from many, many different onramps and offramps throughout clean energy careers to really think about how we can help folks at very different levels of their careers on pathways to get into this industry and sort of think through what some of those transitions look like for different groups of people.

Maddy Salzman: Absolutely. Dean or Sarah, I don't know if you have thoughts to add on the training for – you know, in today's economic climate.

Dean Stanberry: You know, there's – this is Dean – so we did some research, you know, reaching out to local government and looking at other options. There is actually a government program we're just now starting to get involved with that is around apprenticeships. You know, people think of apprenticeships mostly around related to union jobs, but what they're talking about is really trying to develop apprenticeship programs that help people get into some of these positions that do not require a four-year degree and, you know, help them get a head start and then they can decide whether or not they want to go on for a formal education or if they can get employed they may have an opportunity to move forward.

So if you just do a little bit of research there are lots of workforce development programs at the city and state level, but it just takes a little bit of digging to try to find out who's running those and what their requirements are. That's what we did in Denver. We literally spent about a year and a half working with them to put a program together around our FM training, but now that we've got it they really want to expand on it. So a little slow to get started, you have to have a little patience, but once you do I think you have a very rewarding opportunity to bring people into professions.

Maddy Salzman: Awesome. Yeah. Great. One of the – we have a ton of questions coming in, so I'm trying to group some together and things *[laughs]* that can maybe be answered all at once, but one of the most popular ones is about what are ways we can connect with community groups working on environmental and climate justice and help attract enthusiastic black, indigenous and people of color into these workforces? I don't know if those are thoughts any of you guys could jump in on. It looks like Phil, you're ready to go.

Philip Jordan: I'm ready to go. So there's been a couple of different interesting research studies done. We did one actually for a totally different industry and we included climate sustainability and energy in that for a future of work series with Natixis Investment Managers, but we've seen this research replicated by a number of groups, which is that when you sample the population in terms of interest and action for climate change what you find is that black and Latino, but particularly black Americans and particularly black women have the highest interest in sustainability issues and view it most favorably, sort of environmental issues and sustainability, which isn't terribly surprising given the fact that for many African Americans in the US climate change, environmental and

sustainability issues are really public health issues where the impacts of air pollution in particular are much more heavily borne by black Americans than white Americans.

So it's not at all surprising to me in that regard, and I think part of the challenge and part of the opportunity that we have is that we can connect many of the jobs that exist in clean energy and energy efficiency back to the sustainability question, but we tend not to. We tend to think of them in the workforce training community as being construction jobs or manufacturing jobs or engineering jobs. So that's one element that I think we should think about. The second thing is I don't think we do a very good job of really exploring the pathways and helping young people in particular learn about these different careers. So I think there's a big opportunity for us to talk about all of the opportunities that exist, and not just in construction jobs but in all different types of jobs, professional business services, engineering, architecture, design, manufacturing.

All of these different – finance, right? – all of these different opportunities that exist if your passion is in sustainability or climate change. So I think that there is a lot of work that can be done and it starts with awareness and it starts with also a recognition that once we develop these pathways and we know what they are, being able to communicate those clearly to demonstrate that these are good jobs that pay well that have bright futures attached to them, and I think that's a big step that we need to take, which is better communication of the opportunities that exist.

Maddy Salzman: Absolutely. Thanks so much, Phil. Now if others – yep. Go for it, Sarah.

Sarah Truitt: You know, I think a big opportunity we have with energy efficiency is to really explicitly tie it to climate change and change in your own local community so that these jobs are seen as incredibly meaningful and not menial, right, and they have impact and they have real impact on your community and your own home, and I think just making that link will help draw people to the industry itself, and it's also the link that it's very accessible. There are a lot of different ways that you can come in and a lot of different ways that you can grow, and I think showing people that there is a pathway and just that it can be a very impactful and personally rewarding pathway will help.

Maddy Salzman: Absolutely. Thanks, Sarah. I know some things that we've been thinking about on the DOE side that I think relate to what Phil and Sarah have just mentioned here, so one of the advanced building construction workforce awards went towards development of a building energy efficiency career map. So these awards, like I said, were kicked off yesterday so they're just getting started, but I think that the intention of that resource is to be something that people looking for work, and in particular younger people, can use to identify career pathways and understand what they need in order to enter these careers. So we're really excited to at some point soon have that as a resource that we can share.

And another thing that I'll just add that's a little bit my own kind of personal thought processes on these issues, but I find it particularly helpful to try to understand when maybe other industries or other – those other examples that we can learn from, we don't need to kind of reinvent wheels if we can avoid it and learn lessons from others. So one sector that I've been particularly inspired by in this space is just better understanding the kind of renewed interest in young people among agriculture, and in particular sustainable agriculture and urban agriculture. It's not that all of a sudden every young person wants to be a farmer, but I think there are far more young people right now that are interested in those options than we could've guessed before.

And those are not desk jobs; they're dirty jobs. You know, you're working with your hands and all the things that people think young people hate, but I think if we're able to emphasize the connectedness to your community, the ability to serve others, the real kind of mixture of art and science in these activities where you're figuring out what the best options are I think is really meaningful to people, and then ways we can kind of connect the dots where, you know, our clean energy future is something that must be built and we need people to build it I think is inspiring to young people. We continuously find that people are willing to do the work but they want to understand how it's connected.

So that's something that I try to draw inspiration from at least, but I know there's been a lot of questions coming in about, you know, how do we change the perception of the construction industry, how do we do all these things, and I do think it requires some good thought because it's not – working against years and years of vocational programs I think being undervalued and misunderstood in a lot of ways. Unless the panelists have noticed any questions in particular that they would like to answer or things they'd like to address, I know one thing that's come up a bunch is how to make

sure people in the efficiency workforce are sufficiently valued and rewarded for their increased knowledge when they have it. Dean, I don't know if you have thoughts or ideas there. Yeah.

Dean Stanberry:

Yeah, you know, the facility management has – like I said, is the accidental profession. I was just answering a question in the chat box around that and that HR organizations or the Society of Human Resource Management, if I go look at their data they describe facility management as an hourly rate-type job and the salaries that they publish are significantly lower than the reality of what, you know, a fully-qualified facility manager gets. So we've been trying to work with some of the associations to update their perspectives on what FM is and what they get paid. One of the things that is not helping us is that in many cases you'll find like apartment managers, they list them as facility managers but they are actually a minimum-wage maintenance technician.

They do not practice facility management in any way, shape or form, but because they are listed as such they take those and they group all of those salaries in with the higher paid salaries, so it tends to skew the overall salary levels lower than reality. So those are just a couple of things that we've discovered and, you know, slowly but surely trying to work through those and get those perceptions changed.

Maddy Salzman:

Absolutely. Well, great. I don't want to ignore the other questions that are coming in. I think it's possible for the panelists on Slido to even just click reply to some of these questions, but I do want to acknowledge we only have four minutes left and a couple more things to run through. Go to the next slide. So I do want to highlight these additional resources. The Better Buildings Workforce Accelerator that I mentioned at the top of the hour was announced yesterday.

We are still looking for partners, so folks that are interested in trying to address and tackle some of these big questions and issues we're excited to work with you. We also have resources for dealing with COVID-19 from Better Buildings Partners affiliates and other organizations. It's not really stuff that we've created but just aggregating information together because we do recognize the massive impacts it's having across the country. Next slide. I do want to highlight the summer webinar series that will be taking place, as it says, throughout the summer.

A lot of the great speakers that we had planned when the summit was going to be in person and in concurrent sessions have been

pushed to the summer, but they still have great things to offer. Next slide. And here's emails for all of us presenting today, and I know there was a question that came in. It looks like at least one person was having issues with the Better Buildings Workforce Accelerator email. If you just email either Sarah or I to get in touch, our emails at the very least should work.

So, yeah, happy to talk and hear from you guys. Alison, do you still have the video that you wanted to share at the end of the session?

Dean Stanberry: You're on mute, Alison.

[Video plays from 1:27:12 to 1:28:02]

Maddy Salzman: Awesome. Thanks so much, and thanks everybody for attending today. We really appreciate the active participation. I know I'm going to spend some time after this going through and trying to reply myself on some of these questions where I at least know the answer, *[laughs]* and it's great getting to talk about these issues. We know they're super important and I appreciate all of your interest as well. So, thanks everybody.

Dean Stanberry: Thank you.

[End of Audio]