Joe Indvik: Hey, everybody. We're just about ready to get started. Gonna let folks trickle in over the next minute or so and we'll start right at 11:00 AM Eastern.

[Silence from 0:00:13 to 0:00:38]

Okay, for those of you who have joined, just giving the other attendees a couple of minutes to join and then we'll get started in about a minute.

[Silence from 0:00:47 to 0:01:13]

Okay, it's 11:00 so let's get rolling. Hello and welcome to the Better Buildings Webinar Series dedicated to bringing you the latest actionable insights from leading industry experts. This annual series gives us a chance to explore the topics, technologies, and trends that affect your organization as well as efforts to accelerate energy efficiency adoption.

If you go to the next slide, we're talking about commercial and industrial solar energy today which I know for many of you is an increasingly critical topic as organizations look to decarbonize their operations and future proof against both climate impacts and the transition to a low carbon economy. We've got an amazing panel of experts and practitioners today to talk about this topic. They're going to walk us through all the need to know information about commercial and industrial or C&I solar as you'll hear us refer to it occasionally with a particular focus on the finance and ownership models that are available that may give you a variety of ways that you can get solar onto, in, and around your buildings. Our focus is going to be particularly on how your organization could take advantage of the solar opportunity, whether you're already a leader on ESG and solar or whether you're just getting started.

Before we dive in, a couple of housekeeping items I want to cover. So we are going to be recording this webinar today and it's going to be posted to the Better Buildings Solution Center. We'll also send around the recording as well as the slides, so no need to take furious notes if you like to follow the content. And then attendees are going to be on mute during the presentation. If you experience any audio or visual issues, go ahead and use the Q&A box in the Zoom chat and our elite team of webinar facilitators can get you taken care of. We're going to of course have time for Q&A at the end and we'll get to that in just a second.

Go to the next slide. I'm going to be your moderator today. My name is Joe Indvik. I lead the Carbon Solutions and Clean Energy Finance Practices at RE Tech Advisors. We're a consulting firm located here in the D.C. are focused on sustainability in the built environment. My team and I also support the Better Buildings or the Better Climate Challenge on behalf of DOE as well as the Better Buildings Financial Allies Network on behalf of DOE. So it's great to be with you today. I'm going to be speaking a little bit and then handing it over to our panelists for the bulk of the session.

Go to the next slide. Our agenda for today. We're going to do a couple of quick welcome polls to get a sense for where you're coming from and where you're at in your solar energy journey which will help us tailor the rest of the discussion. I'll give a quick overview of the state of the solar market including trends, costs, and financing and ownership models. We'll hear a buyer's representative perspective from a firm called Black Bear that's been looking across the whole C&I solar industry for many years. And then we'll hear some really excellent case studies from the retail and multifamily sectors as well, and then we'll have plenty of time for Q&A at the end.

If you go to the next slide, we're going to be using an interactive platform called Slido for Q&A and polling as well as feedback today, so please right now go to www.slido.com on your mobile device or by just opening a new window on your browser and enter the event code #DOE. If you'd like our panelists to – if you'd like to ask our panelists any questions, go ahead and do so in Slido. Please specify the person that that question is for if you would when you're asking the question if it's for a particular person. Then you'll see other people's questions in there as we do Q&A and you're able to upvote the questions that you like and we will try to answer the most upvoted ones.

So we want to learn a little bit more about our attendees. It looks like some of you are already started to fill this out. We got two poll questions. The first one is what sector best describes your organization? What sector are you representing today? We'll give you a couple of seconds to fill that out. Okay, well, the good news is we have a C&I session and our primary attendees are from C&I, so that's a good place to start. We've got a fair number of state and local government folks, higher education, contractors and consultants pretty well represented, nonprofits and a couple of other sectors like utilities as well. So a good mix of folks. Thank y'all for being with us today. Certainly the insights we're going to talk about, though we're focusing on commercial and industrial, are

going to be very applicable for public sector and really any owner or operator of a building that has the potential to do onsite solar. So welcome to those of you who are from non-C&I sectors as well.

I think we can go to the next question now, and this is a little more specific to solar. This question is where are you at in your solar journey? So where is your organization in its onsite solar? So we're specifically talking about onsite here. If you've been doing things like offsite green power procurement or other things, we're not as interested in that today although we will touch on that. So have you installed solar many times across many locations? Have you installed it a few locations? Are you in the process of doing your first project now? Are you sort of thinking about this as an option or just here to learn and discuss? We'll give people a couple seconds on that one as well. Okay, well, very good smattering again. The two biggest are having done solar at a few locations and just here to explore. So welcome to both of those groups. We've got some folks who are kind of in the process of considering it or developing a new project, and then an elite 10 percent who have done this many, many times across their portfolio. I think we'll have some good content for all these groups today. So again, thanks for being with us. And I think we can go back to the deck and on to the speaker introductions.

Great. So I am very happy to say that we've got three of my favorite people just in general, but particularly with respect to solar and sustainability on the call with us today from different perspectives across a wide range of solar implementation models and structures. So first we've got Aaron Olson who is the head of Business Development at Black Bear Energy which is a commercial buyer's representative. He's going to provide an overview of the solar trends in the market we're seeing and kind of considerations from a building owner or operator's perspective. Black Bear has worked with many, many commercial and industrial clients across the whole US market for many years so they've got great longitudinal perspective on everything that's happening right now in the market.

Next up is going to be Emily Paciolla who leads the sustainability program at Federal Realty Investment Trust which is a REIT that's mainly comprised of open air shopping centers in addition to some mixed-use properties as well. Federal has been investing in and owning solar for many years. They're really an early adopter when it comes to owning solar. Emily is going to speak to some of the lessons learned over the many years of doing those investments at Federal.

Then finally we've got Hannah Tillman who is the VP of Sustainability at Berkshire Residential Investments which is a multifamily real estate investment and property management firm. Hannah and her team have recently gone through the process of evaluating, selecting, and implementing solar leasing opportunities at a few of their properties. So Hannah is going to share some insights from that process, kind of what went well and some surprising things that she learned along the way. So excited for this conversation. Thanks to all these folks for being with us today.

We go on to the next slide. Before I hand it over to our panelists, I want to talk about three things you should now about solar going into this conversation, and this is important for anybody to know these. If you looked at solar maybe three, four, five years ago, certainly ten years ago, chances are a lot of these things have changed since the last time you looked at it. So you may want to reevaluate it. Both the economics and the financing models are all changing in a real time basically as this market matures. So the three trends I want to discuss are the fact that solar costs have come down dramatically and continue to do so, the fact that it's the fastest growing energy source in the US, and the fact that there are now more financing and ownership options available than ever before that can make solar possible at organizations where maybe previously it wasn't a good business decision.

So let's go to the next slide. First, on the topic of costs. So this is a really great chart from the National Renewable Energy Laboratory. The key takeaway is that there has been a massive decline in solar costs over the last decade. If you look 20 or 30 years prior to that, that trend really has continued for many, many decades. So this specifically is showing the dollars per watt, so the installed cost of solar for a 200 kilowatt commercial system. As you can see, the design has been pretty consistent over the last ten years.

Another interesting observation here is if you look at the colors in those bar charts, so the yellow, blue, and gray or light blue, I guess it is, are the sort of technology costs, right? The actual module, the inverter, the hardware associated with the solar system. Everything above that from the peach color on up is soft costs. These are things like labor, permitting, profit margin, sales tax, transmission interconnection, right? So the interesting takeaway here is that now, I think more than ever before, the bulk of the costs for any given commercial solar installation actually come from soft costs which is (a) an interesting observation and (b) really highlights the value of more innovative, lower costs, more efficient business models,

financing options, and other modes of delivery that are making solar more accessible and cheaper along the way.

If you go to the next slide, the second fact I want to discuss is that solar is the fastest growing energy source in the US. This is a pretty incredible graph from the Solar Energy Industry Association. So annual installations are increasing across all sectors which you can see here. The yellow section is the one that we're mainly interested in which is commercial and industrial. If you look across the whole solar market though, there's been a 42 percent annual growth rate over the last decade. That's 42 percent per year on average which is pretty incredible. When you look at the C&I market in particular, that growth has been consistent but fairly uneven year over year. It kind of goes up and down a little bit; but as SEIA said, it has really been boosted by this sustained adoption that we're seeing from major players that have big clean energy commitments, companies like Walmart, Apple, Target, and Amazon. So I would suspect you're going to continue to see quite a lot of growth in C&I and particularly as large portfolios get onboard with the decarbonization transition.

And if we go to my final slide here, I want to talk a bit about some of the financing and ownership models that are available for solar. So if you've looked at solar in the past and said, "Uh, you know, we don't quite have the tax appetite to own the system directly" or "You know, we looked at financing this but we're not comfortable with the balance sheet implications," I think everybody on this call would encourage you to take a step back and look at some other options as well. There's a lot of different ways to own, lease, buy from, and/or in other ways participate in the installation of a solar system onsite. And again, a lot of these have kind of grown in prevalence over the last few years.

So in terms of the options, owning it directly is obviously the classic simple option where you just buy the system and own it and possibly engage a third party to operate and maintain it. One advantage of this is that it lets you capture all of the benefits of the solar system directly. It does have some tax implications. On the one hand – and again none of this constitutes tax advice, so please consult your tax advisor appropriately. But it does have some tax implications in the sense that on the one hand, you can directly capture the investment tax credit that is available for C&I solar systems. On the other hand, you have to have the appetite to capture that tax credit; i.e., you have to, I think, on tax that's able to offset and be a taxable entity. So there's some pros and cons there. And ultimately, by owning the system directly, while you

capture more of the benefits, there's also more risk and effort because it's yours to maintain and manage.

Another option is a roof lease, and we're going to hear about this from Berkshire in particular, but this is a scenario where you can simply lease out your roof space for a third party to own, develop, and operate the system. So it's a really simple transaction. It's lower risk for you because you're really just leasing out your roof, and it's typically a fixed fee. So it's simple, a good way to make some revenue, but you don't get as many of the benefits.

Another option is third party ownership models where you're actually getting some of the benefits from the solar. So the classic example here is a power purchase agreement where a third party owns and operates the system on your roof or in your parking lot and then sells the power to you as the building occupant. These models typically come with little or no money down. So they can often produce savings from day one and/or price certainty in your electricity purchases from day one and of course also come with reduced risk for you because of the third party that's owning and operating the system.

If you're kind of keen to get a lot of the benefits of owning this system directly but don't have the capital on hand to do that, you can of course finance the system. Some options here are regular commercial loans, bonds, PACE financing or Property Assessed Clean Energy financing is available now in many jurisdictions and in the US as well. Again, that has similar benefits to ownership but simply with third party finance supporting it. And then a final option is community solar. So community solar is a term used to reflect a variety of different structures where a community, including both individuals and businesses can participate in the benefits of solar directly. Community solar typically needs enabling legislation at the state level to be possible. And some of the ways that you could participate in community solar are by hosting a system on your site, financing or investing directly in the system, and/or subscribing to or purchasing the energy from the system. So we can talk more about the details here, but community solar is an increasingly prevalent model for doing solar in a way that's equitable and brings benefits to the communities.

So to synthesize all of that, and again this does not constitute tax advice, but when you're looking at solar opportunities, a few of the things to consider and to kind of weight in your mind: One is the risk versus the benefit. As with a lot of transactions in business, there is often a direct tradeoff between how much of the benefit

you're able to capture from the system versus how much _____ that you are going to bear. So understanding kind of where you're at on that slider and how you want to optimize that for your organization is really important. There's tax and balance sheet implications as I was discussing, both in terms of your ability and appetite to capture the tax credit but also whether or not you are comfortable taking debt on to your balance sheet as some of these options, particularly in the finance category, come with that attached.

One other question is REC retention. So just because the solar is located at your site does not necessarily mean that you get to claim the green power benefits from that solar. That differs across these models and can also sometimes be negotiated depending on your desire to make renewable energy claims and reduce your carbon footprint through the system. So that's another thing to make sure you're considering.

And then finally, general management complexity, right? Some organizations are happy to own and operate the solar. Other organizations really just want to get the benefits without having to deal with the operational complexity, in which case third party ownership or in some cases roof leasing might be a better fit. So that's not an exhaustive list, but I think those are some of the key categories of pros and cons to consider as you're evaluating possible options. And with that, I'm going to hand it over to Aaron. So if you go to the next slide, Aaron, over to you. I'll let you introduce yourself a little bit more fully if you want and then provide the Black Bear perspective.

Aaron Olson: Right. Thank you, Joe. Could you go to the next slide? Next slide. Sorry. Right. Good morning, everyone. My name is Aaron Olson. I head Business Development for Black Bear Energy. So Black Bear Energy, we're an owner's rep specific to onsite renewables, so we primarily work on onsite solar and energy storage projects across the United States. So today, we represent over 100 clients of all asset types. The majority of our client base are institutional owners or REITs. We do have a couple public sector agencies that we work with, and we do have some corporate accounts as well. So we are a tech enabled services provider. So we have a proprietary bid platform and we work with our clients to identify opportunities available within their portfolios. We advise them on the options available. If they choose to move forward with those projects, we run the bid process. We have attorneys on staff to help with contract negotiations, and we have project managers to oversee construction. To date, we were founded in 2015 and today about

10 percent of the entire C&I solar market is coming through our bid platform. Next slide.

So just some quick high level bullet points as far as the state of the solar market goes within the United States. Fifty-four percent of all new generating capacity came from solar in the last year, followed by 35 percent wind, and 10 percent natural gas. So we can see there is a trend, a growing trend amongst renewables across the board. We've hit grid parity on both wind and solar. So it is the cheapest source of power to generate. It's still only about 4 percent of the total capacity within the United States. When I first started in the industry about ten years ago, it was less than 1 percent. So we are seeing growth, and it's projected to be up around 30 percent by 2030. And for the first time, solar is being installed in every single state across the country and there's 25 states or more that are installing 100 megawatts or more on an annual basis.

There are some updates coming. With the Build Back Better Initiative, there are climate provisions that could help further escalate growth within the industry. The goal was to get the Build Back Better bill passed ahead of the State of the Union. That obviously didn't happen, and there's been some – you know, just current state of affairs, there's been some delays. With all that said, the climate provisions are the least controversial parts of the bill and there is consensus across the board that the climate provisions need to pass in some form or the other. So if the total bill gets broken out into smaller bills, there is a high degree of confidence that these provisions will get passed.

So as it stands now, they are proposing to extend the 30 percent Investment Tax Credit for solar. They're also looking to introduce the Production Tax Credit option. There is a direct payment option in lieu of the ITC. So this would be extremely favorable for a nonprofit or a public sector agency or a REIT who may not be able to monetize those tax credits. You know, historically, you know public sector and nonprofit, they tend to finance their projects through a third party. If there is a direct pay option, they could look at ownership and that could be an attractive option for them. They're also looking to introduce a standalone storage ITC. Next slide.

All right, so here we have a map of where commercial solar projects are being installed. This is a map that I put together based on just data within our platform. So the darker maroon color, I've identified these as core markets. So core markets are defined in a couple ways. You know, California, just the sheer cost of power

makes solar work within the State of California. And then in the northeast, it's a combination of a high cost of power and incentives that are available. And there's also programs that allow for scalability within these markets as well on the commercial side.

So in the northeast primarily, they've introduced community solar programs which allow you to, rather than feeding power – consuming power onsite, you can feed the power back to the grid and a local pool of subscribers will opt in to essentially purchase the power. There's also carve outs for low to moderate income subscribers. So by hosting a solar array and allowing subscribers to procure that power, you are essentially subsidizing power for LMI offtakers. So that's primarily northeast. Minnesota also has a community solar program. Illinois has a community solar program. And then the State of Wisconsin and New Mexico are looking to introduce programs as well.

The lighter shades, I sort of identified these. You know, we are seeing projects being built in these markets. It's just a little more challenging. When you're looking in California, when you're looking in the northeast primarily, you can account for – you know you can do carports, for example. If you have a roof that's midlife, you can build in system removal and replacement costs to have a system installed to replace a roof midlife. There are just more unique structures you can do. These lighter shades, if you are pursuing a project there, you know, it's going to have to be a new roof or a ground mount. There's probably going to have to be some scale, and a multifamily building is going to be a little bit more challenging, but if you have a high energy load and a lot of square footage to work with, you can make projects work. Not to say Arizona, Texas, Florida, there's a lot of solar going into these markets. It's just all in front of the meter, a lot of utility scale solar but not so much on the commercial side.

So on the right here, I just have a couple of things. You know, when we're working with a new client or just trying to do an early assessment on the feasibility of a project, these are some of the things we're looking for. You know, we want to understand the age and condition of the roof. We want to understand whether the property is going to be held for a long period or is the property going to be redeveloped or is it going to be sold in the next year. Those are all important things to know. If you are looking to redevelop a property, I would strongly – probably strongly suggest not doing solar or limiting it to an area that is not going to be redeveloped. It's always important to look at the utility billing data regardless of whether you're using the power onsite or feeding it

back to the grid. Just it's always good to sort of check that box and understand which model is going to be more favorable economically. If you are using the power onsite, I think the main advantage there is that it just gives you more control of the project and your project is less likely to be held up for interconnection studies and things like that. You know, and understanding if you have a tax appetite is always important for the modeling.

And then later on for further due diligence, a lot of this is just formality. But if you are looking to finance the project, you're going to have to provide a credit rating or some form of audited financials so that they can underwrite the project. If you have a lender or if there's debt on the property, it's always good to notify the lender ahead of time. These projects, if they're financed, lender can send his required. Again, 99 percent of the time it's just a formality, but there are some. Like if it's a commercial mortgage backed security, for example, that could be a no go. You want to notify any joint venture partners. So if the property is co-owned, it's important to bring that other partner in and notify them and make them aware of what's going on. And then you want to notify the roofing manufacturer as well. Again, it's just a formality but the roofing manufacturer, you're going to want them to come in and do an inspection before, during, and after. And if you are making penetrations into the rooftop, they're going to have to sign off on the flashing method in order to maintain the warranty and sometimes they'll require that they self-perform that work. So again, just a formality but always good to bring them in early.

And then again, insurance, it's always good to notify your insurance provider. Again, if it's a third party owned system, the solar developer is going to carry adequate insurance; but again, they're going to want to have eyes on it; and some insurance providers will have stricter requirements than others. You know, they may have some input in some of the design and so forth. And then just make sure all the stakeholders are involved as well. Notify them early. If you have a construction manager onsite who is going to be sort of quarterbacking the onsite construction, make sure they're aware this is coming along.

All right, next slide. Okay, so here – sorry. I know this one is a little bit wordy. These are just some common provisions that we include in our solar lease contracts. So, you know, you want to make sure there's a decommissioning reserve. So at the end of the term, 20-year term, there's money set aside to remove this system if needed. And we like to include reserve areas with our contracts. So we'll set aside 10 percent of the roof area, so if a tenant or if

you need to add additional mechanical equipment, there's space to do so without terminating your roof lease.

Roof replacements are the responsibility of the landlord. So if the roof is midlife and there is going to be a planned roof replacement at some point during the term of the solar agreement, you're going to want to make sure that those costs are built into the contract ahead of time or just be aware that there will be an expense later on that he would have to incur. And then you want to make sure, you know, you are allowed a certain number of hours of downtime on an annual basis. So that tends to be heavily negotiated. So if you know your system is going to have to be offline, something to be aware of.

And I know we're coming up on time. I know. One last comment. When you're looking at a PPA or a solar roof lease or whatever it may be, you know, obviously have your internal legal team look at it. If they don't have any familiarity with these solar lease agreements, I would probably advise to seek external counsel. These things take quite a bit of time, and if you're using a firm that has more familiarity it's a little bit easier to get through that process. And personally, we like to do legal workshops. So once the contract has been turned a couple of times, we just set a five-hour, block a five-hour window and just get through a majority of the contract rather than passing it back and forth for six months. So we've been able to get our contracts executed – I'd say the industry average is probably six to eight months, but we've been able to get that down to one to three. I'd say that's it.

The next slide, I just have a couple projects. Don't need to dig into it too much but I kind of just want to show these really quickly. You know, this is a multifamily building. You can see there's tons of HVAC equipment up here, mechanical equipment. You can still get a fair amount of solar on these rooftops even with all the equipment. This one in the middle, this is a raised racking system. So this property was going to require a midterm reroof, but we actually installed an elevated racking system, so these panels are sitting about five feet above the roof deck. This allows you to go in and recoat the roof midlife, and it also allows you to get more solar on the roof. This is just a parking top, park top structure. That's it.

Joe Indvik: Awesome. Thank you, Aaron. We see some great questions already coming through, so keep the questions coming. Go to Slido.com #DOE. There's also a link on the Zoom chat if you'd like to just click on a link as well. So we go on to the next slide. I'd love to introduce Emily. As I mentioned Federal has a long history

of owning solar systems and can speak to some lessons learned from that history. So Emily, over to you.

Emily Paciolla: Great. Thanks, Joe, and, Aaron, great overview. So let's go on to the next slide and one more. Thank you. Okay, so as Joe mentioned, my name's Emily Paciolla. I am the Director of Sustainability here at Federal Realty Investment Trust. I've been with the company for just about almost four years now. So the solar program predates me, but I will still give an overview of our journey. So a little bit about who Federal Realty is first. So we area a publicly traded US REIT, a real estate investment trust. That will become a little bit more relevant as we go. And we are owners and operators and also developers of high quality retail real estate. So most of our properties are open air shopping centers with a handful of mixed-use assets in there as well. And our primary markets are shown here on the map. And we have about 104 properties covering around 25 million square feet just to give a sense of scale.

And one thing that's important to note, for us as we're long-term holders, I saw some government agencies maybe on here too which I believe that is consistent with you all as well; but our average hold time for a property is about 20 years. And so any time we're making any sort of investment decision or planning of capital investment into a property, we are taking a long-term lens. That obviously applies to solar as well since the systems are built to last around I think 25 to 30 years is usually what we model.

Next slide please. So just a quick touchpoint on some of our ESG highlights. Happy to talk through any of this later or feel free to look through our most recent sustainability report from last year. But two relevant points to the solar conversation are our 30 percent reduction target of Scope 1 and 2 greenhouse gas emissions which is landlord controlled greenhouse gas emissions. Our solar efforts directly help us achieve that goal and are kind of they're guiding how we're looking at solar projects now which is a little bit different than previously because this goal is rather new. We just announced it last year. So the change in the ESG landscape is changing a little bit how we look at onsite solar arrays.

Next slide please. Okay, so here's a little bit about our journey. So we first started thinking about solar back in 2010. Just a little bit about Federal's culture. We are very much empowered to think innovatively, very much an entrepreneurial spirit here at the company. And so that manifested itself in a property team looking into solar so that our solar program predated having anyone even fully dedicated to ESG or sustainability. The property team looked

at this as a way to ancillary revenue. So we started looking at it in 2010. Our first projects were installed in 2012 with four projects in New Jersey. So the reason we started in New Jersey was, first, that was where the property team was located who piloted this program but also because of this strong abstract market. So I mentioned originally these were financially – they're financial projects, right? Like we look at this to generate extra revenue.

And a little bit about why it took a couple of years to set up is it took us a while to figure out exactly what model made the most sense. Of course as Joe and Aaron just talked about, the landscape of solar was very different ten years ago, so our options were a little bit different. And to combat some of the REIT challenges, which I'm happy to talk about in more detail if there are questions about it, we had to set up some internal structures to be able to accommodate the solar revenue and to attempt to create a tax appetite to utilize the Investment Tax Credit. Just a quick note, REITs don't pay taxes so we set up a taxable REIT subsidiary; and I'll talk a little bit more about that in a moment. So another major point here is that the tenants at these four properties made the projects possible, and again I'll touch on that in just a moment.

And so we started with four projects up in New Jersey. We've now expanded to 25 of our properties out of about 104 have solar on their rooftops, and we have about 13 megawatts of capacity, and they're located basically in the major markets that Aaron highlighted where solar makes a lot of sense mostly because there's a strong financial incentive, either SRECs, an SREC market, a Feed in Tariff market where you can sell the power back to the utility, a SMART program which is similar to SRECs, and a variety of others. And so we've kind of taken what we learned from the first four projects. We now have the internal infrastructure and then have expanded it to all the places that made a lot of sense from a financial perspective and a property perspective.

Next slide please. So to dive into a little bit of the things we've learned along the way over the past decade of owning and operating – I actually didn't mention that. So we own all of our solar arrays. So we own them outright. We pay a third party to operate them, but there are no third party ownership structures currently in our portfolio. So I mentioned the REIT structure is still a challenge. So if we are able to take the ITC as a cash grant, that's going to be much easier for us. And we are also looking at other ways to creatively utilize the ITC with tax equity partnerships and other things like that, but historically we haven't been able to use the ITC. And I will mention that project is still penciled even

without it, but obviously a 30 percent either cash or tax incentive makes a huge difference on the return of a project.

But what I want to spend more time talking about is some of the practical implications. So Aaron mentioned this a little bit, but your electric load on the property kind of dictates how the project will go. So if you think about a solar array, obviously it's producing electricity. That power has to go somewhere. And so for us, we are a retail landlord, like I mentioned. Most of the electricity that we control is parking lot lights and that's about it. An open air shopping center doesn't often have internal common areas like a more traditional mall does. We don't usually have the tenant utility accounts in our name. And so the amount of electricity that we can supply solar to is relatively low in most cases, and so that's been a little bit of a struggle to overcome.

So we have really big nice wide roofs like the one you see here but nowhere to put the power; and so to answer that specific concern, we've come up with a couple of different strategies or utilized a few different strategies. Number one is partnering with tenants. So we can do our own PPA essentially where we partner with our tenants onsite, we own the panels, and then we sell the power directly to them. If it's a tenant that's going to be around for 20 years, great. Usually that's very simple. Well, simple once you get through the process. A great solution but tenants turn. Especially nowadays in the retail sector, things are a little bit less predictable than they used to be. So that's not usually our first choice. The other option would be if we can do some sort of Feed in Tariff programs. So Aaron mentioned that it is usually a little bit longer of a lead time to get the project approved and installed; but then from an operator's standpoint, once it is installed, generally speaking it's usually very simple, clean. It's really easy 'cause there's not very much variability. We own the system. So if there are production impacts, you know, we feel the hit of it but we're not getting a tenant asking questions about it.

Another challenge with tenants, because again we're a retail, is the roof and rooftop equipment. So again, looking at this picture here, you can see all of the HVAC equipment on the rooftops. The panels are built around it, which if the property didn't change, great, like that's not a problem. The issue comes when a tenant vacates or really when they occupy. If the tenant wants a different layout than the prior tenant had, oftentimes that requires movement of the rooftop units which can get really expensive no matter how you have the solar set up, to be honest, even if it's a third party owning it because you have to take the solar down which costs

money, you're losing revenue when it is down, and then you have to pay somebody to reengineer the system because it's going back in a different layout than it was in before, and then you have to pay somebody to put it back. So that's influencing a lot of our evaluation of future projects. We're trying to pick rooftops where there's less tenant turnover, less risk of that happening, or properties that were recently redeveloped so we know we're not going to touch them for a long time to reduce the destruction and the impact.

Okay, so let's move to the next slide. Okay, and this will be my last one. So how we're looking at projects moving forward. I mentioned a lot of this already, but we're really starting to look at things on a case-by-case basis. As you saw the list of states that we have projects in, we've already kind of captured a lot of the low hanging fruit. So we're really looking at projects that meet the criteria that I just described so stable rooftops, strong financials, also an easy way to offload the power, so somewhere simple that we can provide the power either onsite or to Feed in Tariff program.

And then we're also obviously we're a publicly traded company. We're a real estate company. The bottom line matters a lot; however, it's starting to be looked at a little bit differently with solar projects specifically because of what I mentioned earlier with the greenhouse gas emissions reduction targets. So now even if a project, let's say it's located in a strong SREC market, that's great for financials but as soon as we sell of the SREC, we can no longer claim zero emissions. So projects are being looked at in a very different context than they had been otherwise.

And then just to touch on that last middle point there, we are looking at structures with third party ownership; however, we haven't been able to work internally because we don't want to sacrifice roof control and because tenants are number one and it makes people nervous internally having a third party own a structure that's on top of the roof. And because we did all of that work a decade ago of getting the internal party and internal infrastructure set up to own the panels, it's really hard for us to say no to owning it ourselves because oftentimes again, the financial, the revenue collected is much stronger if you own the system directly. And yeah, that pretty much wraps it up. I'm happy to answer questions. I gave a lot of information very quickly, and we have a lot of experience with this and there's a ton of nuance. So happy to answer those questions as they come.

Joe Indvik: Awesome. Thank you, Emily. Great presentation and congrats on doing solar since before it was cool. I'm sure you're still doing it now that it's cool. Great. So if you go to the next slide. And keep the questions coming. I'm seeing some really good questions. Make sure you're adding more in Slido and upvoting the ones you want to see. We should have about ten minutes at the end for questions. And I'm going to now hand it over to Hannah for a totally different way of doing solar, not so much focused on ownership but rather leasing. So Hannah, take it away.

Hannah Tillmann: Thanks, Joe. Hi, everyone. My name is Hannah Tillmann. I'm a VP of Sustainability at Berkshire Residential Investments. And as Joe mentioned, we're just entering the world of onsite solar. So we're really excited to share our experiences so far and our lessons learned with you today. We're learning new lessons all the time, so it will change.

If we hop two slides ahead, that would be perfect. Thank you. So starting with an introduction to Berkshire, we are privately-held, vertically integrated, multifamily sector specialists. Our assets under management are divided between debt, value add, and core/core+ strategies representing about 339 units across the country. We have about 87 apartment communities and 8 senior housing communities in our equity investment strategies.

Hopping to the next slide. Berkshire's vertically integrated platform across our investment strategies does allow us to manage many aspects of our operations in-house from property and portfolio management to sustainability. So BerkshireTHRIVE is our sustainability program and consists of an integrated set of strategies to monitor, track, and really enhance our real estate performance. To guide our sustainability efforts we have developed environmental performance targets which we will likely be refreshing in the future, especially as it relates to carbon reductions.

And so when we are talking about emissions reductions, we are really looking at our multifamily equity portfolio. And to accomplish these goals, we have looked primarily to energy efficiency in the past but more recently to the procurement or installation of clean energy at our properties where it makes sense which brings us to the topic of onsite solar. So Berkshire is taking a measured and conscious approach to the installation of onsite solar within our multifamily portfolio, and we are really relying on industry experts and research to guide us in our decision making because this is a really new business area for us. So over the next

couple of slides, I'll walk you through our journey, share a few lessons learned. And then at the end, we can go through a quick overview of our current projects.

If we could go to the next slide please. So back in 2020 which feels like yesterday and two years ago at the same time. We initiated conversations with our sustainability consultant RE Tech Advisors to help us understand the state of the solar market because we really weren't super well versed in that area. They helped us look at opportunities and challenges when looking to install onsite solar, specifically in the multifamily setting as well as funding and financing options which were really important for us to consider. Like Emily, Berkshire operates as a – well, we're private but we still operate generally as a REIT as well. So we did need to consider strategies from this lens. So in terms of lessons learned from this step, doing our upfront research was totally critical. It allowed us to share the value proposition with key internal decision makers, assess our own team's capacity for implementing and overseeing solar projects. And long story short, we didn't have a ton of capacity. We understood the pros and cons of installing solar at apartment communities which has its own nuances and identifying the most appropriate solar business model to fit our needs which we'll hop to the next slide and discuss.

So based on this initial research, Berkshire decided to partner with Black Bear to help us procure, negotiate, and manage our solar projects and to go with a project structure of a solar rooftop lease and Power Purchase Agreement or PPA for short. This business model allows Berkshire to rent rooftop space to a solar developer who constructs, owns, and services the rooftop panels while providing the property and Berkshire with electricity as well as rental payments for the use of the rooftop area.

Big lessons learned here were that partnering with Black Bear allowed us to merge their team's project management, construction, and legal knowledge as Aaron mentioned so as really not to overburden our internal team which was already really busy with their current workloads. Their services also came at no upfront cost to us which made this consulting model really appetizing. Additionally, the PPA and rooftop lease solar model aligned with our REIT fund structure and reduces risk to Berkshire as it allows us to capture good income from the rooftop lease, does not require upfront capital expenditure, and really leaves the management of the panels to companies with expertise in this area.

Going to the next slide, so we worked with Black Bear to conduct

a solar assessment of our portfolio, bid out the projects, and identified the most competitive proposals. And I want to stop here and share a bit about how we selected properties for solar installations. So we sat down and identified properties that were in core funds with ESG objectives to participate in a further Black Bear solar assessment and this is really due to their long-term hold period. As Emily mentioned, solar is more of a long-term strategy for us and this aligned with the hold period in the core funds as well as alignment with investor interests. So those funds that had ESG objectives were obviously more interested in beginning this solar journey along with Berkshire.

So once we got that list, we then provided that to Black Bear and they really assisted us in whittling down our list to optimal solar candidates. As Aaron mentioned, this oftentimes includes identifying properties in geographic areas with high power costs and favorable regulatory environments, as well as properties with proper architecture for onsite solar installations. So in multifamily you're looking for a place with a lot of rooftop area. So not all of our high rise buildings, for example, are great candidates.

Lessons learned from this phase include the fact that our closed-end funds, those with shorter-term hold periods are super tough candidates for solar just due to the time it takes to complete a project as compared to that relatively short hold period. Also as Aaron mentioned earlier, we did find it helpful to consider park top and carport solar options when assessing our properties for solar opportunities as these are a very valuable amenity to our residents in the form of vehicle shelter and then obviously they offer that additional room for electricity generation to improve the economics of the deal. Finally, this likely goes without saying, but bids did vary substantially between potential development partners. So we were really happy to have undergone the competitive bid process and we selected the deals or I guess we were able to select the deals with the best economics.

Moving to the next slide, so we continued our solar journey by offering conditional awards to select development partners and initiated contract negotiations. We learned a lot through this part of the process. First, it was necessary for us to bring in outside counsel that was knowledgeable in onsite solar contracts to support our internal legal team which again didn’t have a ton of experience or really bandwidth to make these projects continue forward. Second, we found that we needed to involve relevant stakeholders early in the process, as Aaron mentioned, especially lenders because they are pretty hands on and they did want to approve of

final contract language and had a lot of questions upfront. Third, solar contract negotiations are a team effort. They required a lot of players in Berkshire to participate, many of who I have listed on this slide here. And finally, it was important for Berkshire to retire the renewable energy credits associated with our solar consumption. So we made sure that this was a priority to be included in our contracts language.

And then on the next slide. So here we land on our current step in the solar journey where we are continuing our contract negotiations and initiating annual reviews of our portfolios to identify onsite solar opportunities. From this step we have learned to be patient. The first contract did take our team some time to finalize, and we realize it was the first one, and then we'll be able to move forward with that template agreement and to hopefully make sure the contract negotiations going forward take less time. We did find it was the most efficient for our team to just hop on the phone and discuss questions with legal representation rather than trading emails. And finally, it was beneficial or it is beneficial to review our portfolios frequently for solar opportunities. Like Emily mentioned, project feasibility is continually changing. For us it has to do with portfolio churn as well as solar market specifics.

And then we can go to the last slide here. So we've got some discussions on project challenges, wins for getting stakeholders onboard and a quick overview of our current projects. So for Berkshire and I think for a lot of folks, the main challenge is stemming from our efforts to install onsite solar are the fact that the projects do take about two years from opportunity identification to project completion. Additionally, these projects require input from a ton of internal and external stakeholders which just requires a good amount of coordination and negotiation.

So I wanted to specifically talk about some key wins for getting internal stakeholders onboard with solar projects since Berkshire is newer to solar and that was a big part of the process for us. The first piece would really be basically including project values in a format preferred by decision makers to make the business place very clear. We also had top-down support from C-suite leaders which is critical to our success as they encourage these initiatives and swayed the opinions of other decision makers throughout the chain of command. And finally, information sharing internally allowed for increased interest in future solar projects as we work to really consistently share project updates and value propositions along the way.

I do want to stop and talk about a couple of unsuccessful projects. So we did have a couple of projects that originally had a decent business case but just didn't pencil out for Berkshire. This was due to the fact that some properties just had too short of a hold period for us to put the effort in prior to the sale. And additionally, we did have a property drop off the list due to findings from a solar developer's site visit that noted constraints that were not originally identified. So this included a really valuable rooftop deck amenity as well as a need to reserve additional rooftop areas due to snowfall risk mitigation. So these constraints reduced the size of the planned solar array and no longer made the project profitable.

The two projects we are currently pursuing are in California. AIRE in San Jose and One Santa Fe in Los Angeles are shown on the right hand side of the screen here. These properties were great candidates for solar as they both participate in core funds with ESG objectives and had lucrative rooftop rental income due to their midrise structure with ample roof space as well as their location in California where we know the market dynamics are favorable. So AIRE is offsetting about 85 percent of landlord controlled electricity with about 275 kilowatts of planned solar capacity while One Santa Fe is operating slightly differently. They're actually going to be offsetting about 78 percent of whole building consumption including the electricity use of residents with about 1700 kilowatts of planned capacity. So we're really excited that both projects have an estimated completion date of Q4 2022; and in the meantime, we're working internally to identify our next candidates to pursue for onsite solar at Berkshire. So that will turn it back to you, Joe.

Joe Indvik: Awesome. Thank you, guys. We've got a couple of minutes for Q&A. Won't be able to get through all of them, but we'll ask some of the high priority questions here. And then we've got a couple of wrap-up slides at the end. So the most upvoted question and I guess this is primarily for Aaron but feel free to opine, others, if you would like as well and also feel free to come back on video to accompany my face, if you would. Hello. So the question is when you're putting solar on the roof of an existing building, do you typically need to add structure to support the weight of the solar or what do you need to do to get a roof ready for solar? So it's Aaron and then Hannah and Emily as well, if you'd like to weigh in.

Aaron Olson: Yeah, so you typically don't do any structural upgrades, and most buildings don't require it. So a typical solar array will weight anywhere from two to four pounds per square foot, and sometimes you can get it as light as 1.5 pounds. You know, if a structural

assessment is done and it is determined that the roof can't support the solar, it's usually cost prohibitive to do the structural upgrades.

Joe Indvik: Got it. Thank you. And then we'll do one for Emily and one for Hannah. So Emily, question, well, feel free to take one or both or either of these but one was asking about the PPA structure. So how does the billing work with the current utility bill? Do you have to take over the electric account for their space and bill them on a net basis or sort of how does that all work? And then the other related question was how come there's some roof space left on top of your buildings in those pictures you showed that didn't include solar panels? Was there an engineering reason for that or was that just sizing the system below maximum possible?

Emily Paciolla: Yeah, I can take both. I'll try to be fast. So I'll take the second question first. So roof space, most times we're limited because of safety requirements. There has to be a specific amount of space between the panels and the edge of the roof. We also have access considerations. So we need to be able to access the HVAC equipment also address any roof leaks that happen under the panels, and then sometimes we just don't have roof control. So sometimes the tenant controls the roof and so we don't even have the option to put panels there.

And then in terms of sizing the array and providing power to the tenant, if we can supply power directly to the utility and get paid a decent rate for that, we absolutely will. We will usually choose that option. But sometimes we can't. So how it works for a PPA – and this will also answer a little but more of that other question, too – we physically will connect the solar to a tenant space. Sometimes we structure the PPA where we sell them 100 percent of what's produced. So we don't ever look at their utility bills. It's just assumed that the system is sized appropriately that they will never have excess solar generation. So we bill them on what is produced. Occasionally we have one or two cases where the tenant does send us their utility bills because the utility account nine times out of ten is still in their name. We compare the utility bill with the solar generation and bill them only for what they used. And then if there is any excess solar, so if there's not a program set up for this, it's not great. So if there's excess solar, it gets sold back to the grid and we get credits for it of whoever holds the utility account; but usually it's paid back at wholesale rate; so the amount you're being reimbursed is far lower than the amount that gets offset. So usually we try to avoid that as much as we can.

Joe Indvik: Beautiful. Thank you. And then, Hanna, question for you. One person was asking just for you to clarify that – so you did both a lease, a roof lease and a PPA model. Can you talk more about kind of how those interacted with each other or how that was structure exactly?

Hannah Tillmann: Yeah, definitely. So that's correct. So we're leasing our rooftop space to the solar developer, but we are also agreeing to purchase the electricity produced, and it actually gets connected behind the utility meter for our property. So we are just going ahead and consuming it directly ourselves. So Berkshire benefits in the fact that we're receiving the rental payment and then we're producing – or sorry, purchasing electricity from the developer at a fixed rate which does have an escalation over time which allows us to potentially save a little bit on electricity as well; but the primary benefit is in the form of the rooftop income.

Joe Indvik: Got it. Okay. Very efficient Q&A. Thank you, guys. There's a bunch more questions we didn't get to, so we're going to go ahead and do an offline Q&A. We will send your high priority questions to the panelists and then for those that they're able to answer, we'll pin those to the notes that are sent around so that we can get more of your questions answered. So thank you, all. We've got a couple of closing slides here that we can walk through quickly and then we can wrap it there. So again, as I mentioned, this webinar was part of the 2021-2022 Better Buildings Webinar Series. As you can see, we're almost done with the series. You can visit the Better Buildings Solutions Center to learn more about other webinars, upcoming and past, and register for any that you missed.

If you go to the next slide, our next webinar is going to be on April 5 titled "Low Carbon Technologies: Strategies for Different Building Types." So you can join this webinar if you want to learn about strategies that some owners are already using and those that you could be using to get buildings to low and no carbon status.

Go to the next slide. Also excited to announce the Better Buildings Summit, Better Buildings Better Plants Summit, which his going to take place May 17-19. This event is going to feature engaging and interactive sessions, opportunities to network with fellow industry peers and experts. Very happy to say it's going to be in person this year right outside of Washington, D.C., in Arlington, Virginia. Registration is going to be coming soon. Also visit the Better Buildings Solutions Center for more information about the summit.

Go to the next slide. If you're interested in learning more about the

specific things we discussed today around solar, we've put together an Additional Resources handout that's going to be posted into the Zoom chat so you can download that right now and start looking at existing resources on the Better Buildings Solutions Center. It has links in the handout. So we hope you find that useful and enjoy.

If you go to the final slide, with that I just want to thank our panelists very much for taking the time to be with us today. I think it was a great discussion of kind of the full spectrum of options for deploying solar into the C&I space. Like I said, we're going to do a remote or a virtual Q&A to try to get some more of your questions and then we'll send that around. I also encourage you to follow the Better Buildings Innovative on LinkedIn and Twitter for all the latest news. You can find the handles for the Better Buildings accounts here on the left hand side; and then as you can see, we've got contact information for each of our speakers on the right hand side if you would like to reach out to them directly. And as a reminder, you'll get an email notice when today's recording, slides, and transcript are available on the Solutions Center. And with that, we can end it there. So thank you very much.

[End of Audio]

Additional Speaker Q&A:

Better Buildings does not endorse or recommend any product or technology provider. The answers in this document are solely the opinions of the speakers based on their professional knowledge and experience.

Additional Questions

Audience member: Can you please provide few comments on the current rate of acceptance/acceleration for residential Solar installations? How would you describe the current state? any comments on maybe future state too?

Aaron Olson: I cannot speak to the residential solar market but in general, the residential solar industry is growing faster than commercial. They've been able to streamline the development and finance process to allow scalability.

Audience member: What is the best way to estimate how much solar can generate electricity? Do you use any software? Because that is so important information to calculate the economic analysis (e.g. payback years).

Aaron Olson: For preliminary estimates, you can use NREL PVWatts calculator. It's available for free at: https://pvwatts.nrel.gov/. Enter your address, select the weather station, and enter the system size (or enter 1 for the general solar irradiance).

Emily Paciolla: To add to Aaron's response, if you are working with a consultant or developer, they will provide this information for you.

Audience member: Where can I find help setting up short-term (typically 5 years) third-party ownership options for monetizing tax benefits including accelerated depreciation like partnership flips, sale leaseback, etc for municipal facilities in particular?

Aaron Olson: I would start with a certified public financial advisor on the structuring. I did some lease backs in my former life as a solar project developer. As the developer we only provided our system price inputs and the FA did the rest.

Audience member: What is the typical capacity factor for an average installation?

Aaron Olson: Solar is intermittent so the capacity factor is only around 30%. That is why net metering and energy storage are so important. It allows you to over generate during daylight hours and use the power during non-solar producing hours

Audience member: PJM is considering a 2-year pause when reviewing/approving new energy projects (majority are solar projects) - what effects would this have on the solar industry for PJM sector?

Aaron Olson: PJM interconnection timelines are already notoriously slow and time delays are already anticipated. I don't think it will keep developers from submitting projects but it will slow down installations.

Audience member: How can we use solar experience to inform how to do financing and third-party ownership for geothermal heat pumps?

Aaron Olson: There are EE Financing companies that have taken the PPA model and are applying it to Energy Efficiency. The only two I'm aware of are Metrus Energy and Redaptive. They can advise further.

Audience member: How can multifamily cooperatives and other non-profits take advantage of tax credits if there is no tax obligation to off-set? What other incentives are available if tax credits aren't an option?

Aaron Olson: If your property is within one of the core markets: CA, NJ, NY (NYC Westchester, Long Island), DC, MA... you may be able to achieve an attractive financial return without them. Otherwise, you typically finance through a PPA, solar lease, or loan product. Keep an eye out for the Cash Grant option in Lieu of the ITC as part of the Build Back Better Climate Package.

Audience member: Have any of the panelists considered doing community solar and enabling families in their community to go solar, including LMI communities? Why or why not?

Emily Paciolla: We are actively considering participating in community solar projects (hosting the solar on our rooftop). We haven’t moved forward with one just yet because we’re determining which properties would be a good fit.

Audience member: Is competing with offsite solar rate plans from utilities in competitive markets like TX a significant barrier & how might this be overcome?

Aaron Olson: The two are not mutually exclusive. The main barrier to onsite renewables in markets like TX is that they don't have net metering. Projects can only be sized to offset daylight consumption. Couple this with cheap retail power. It's just hard to make the projects pencil.

Audience member: Does Federal see EV charging stations as an important customer draw and tenant amenity moving forward and is this an attractive use of on-site solar power?

Emily Paciolla: Yes, we do see EV charging stations as a value-add to our properties. We have nearly 300 charging stations installed. However, most of them are not linked to solar. These are two separate initiatives in our portfolio - they certainly can work really well together, but we haven't done a project set up like that yet.

Commercial and Industrial: State of the Market and Solar Lease Best Practices

Additional Resources

Learn more about the topics discussed on the webinar by visiting the resources below.

Better Buildings Resources

- Better Buildings Financing Navigator
- PPA Fact Sheet
- On-site Solar Decision Guide
- Commercial Rooftop Solar FAQ
- Lease Financing Fact Sheet
- Regency Centers Implementation Model
- The Towers Companies Implementation Model

Explore more resources on the Better Buildings Solution Center

Other Resources

- UCSD: Study Regarding Ancillary Benefits of Solar
- Black Bear Energy Projects webpage
- U.S. Solar Market Insight Report

Up Next in the 2021-2022 Better Buildings Webinar Series

Low Carbon Technologies: Strategies for Different Building Types
Tuesday, April 5th from 11am – 12pm ET

It is possible for most building types to get to zero carbon emissions using technologies already available on the market today. Join this webinar to learn about the strategies some owners are already using – and those you could be using – to get buildings to low- and no-carbon.
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