

Hannah Debelius: Welcome to the Better Buildings Webinar Series. It is dedicated to bringing you the latest insights from leading industry experts. This series is a chance to explore the topics, technologies and trends that affect your organization. Next slide.

In partnership with the National Apartment Association, today we will be discussing EVs at Apartments, hearing from both technical experts and also owner and operators, real world installations on the ground. Before we get started, however, I do have a couple of housekeeping items. First is that this session today will be recorded and archived on the Better Building Solution Center.

And we'll also follow up with everyone who registered for this session with those slides and recording. So you'll be able to click on the links and be able to dive even deeper to all the information that we'll share today. In depth additionally, attendees are in listen only mode, meaning that your microphones are muted.

So if you experience any AV issues throughout the webinar, or have other questions about technology of the webinar, you all have that Zoom chat and we'll be able to follow up. Next. My name is Hannah Debelius. And I'm in the Building Technologies Office, the US Department of Energy and I have the extreme pleasure of working with our commercial real estate and our market rate multifamily partners within the Better Buildings program. Next.

Since we are in partnership today with the National Apartment Association, I'm really pleased to welcome all of our new audience members that might have found us through their channels. So I did just want to give a really quick overview about the Better Buildings initiative.

Better Buildings partners with more than 900 leaders across industry sectors to catalyze investment in energy efficiency and carbon emissions reduction. We highlight leadership, identify key barriers and also share solutions. And in fact, we have over 3000 solutions available on Solution Center. And those are completely open access and free for you.

So if this is something that's of interest to you, and you'd like to be more involved in our Better Buildings network, my contact information will be at the very end and on the website. Next.

With that, we'd also like to highlight a little bit of working, have all of our Better Buildings partners get to know the National Apartment Association. So, James Campbell is here to tell us a

little bit more about that. He's the Senior Manager of Industry Relations at the National Apartment Association.

Previously, he held Director of Level Positions in Marketing at the American Society of Mechanical Engineers, and for Manufacturers and Machine Tools, Construction Healthcare and Office products. So James, if you could tell us a little bit more about NAA.

James Campbell:

My pleasure, Hannah, and thank you very much for this exciting opportunity to co present this webinar on the important topic of EVs at Apartments. Next slide please. Those who may be unfamiliar with us, the National Apartment Association or NAA is the leading voice and preeminent resource for the rental housing industry.

We represent the needs and interests of over 93,000 members who manage more than 10.5 million apartments nationwide.

Among our many offerings or member services, education and career services, including our award-winning credential programs, meetings and events, including our big Apartmentalized Conference, advocacy across a range of policy issues, operations solutions, including our industry standard, click lease and click on compliance software programs, publications, including our unit's magazine, and much more.

Please visit our website to learn more. Next slide, please.

Hannah Debelius:

All right, I think that's back to me. Thanks so much, James. So now that you've heard a little bit about your moderators and hosts today, we're hoping to hear a little bit more about our audience. So right now, you all can go to [slido.com](https://www.slido.com) and enter the event, DOE. We're going to be using this platform for some polls of engagement, and then also to accept questions throughout the whole session.

So while I'm on the topic of questions, when you use this platform to submit questions, you also have the opportunity to hit the little thumbs up button next to questions. And that will make sure that the questions are the most popular, rise to the top of our queue and we'll address those first. Yeah.

So it sounds like you were all up and rolling already with our poll. Again, that's at [slido.com](https://www.slido.com), code DOE, you can open up a new browser or remote device. We're just curious to hear who we've got on the line today.

So it looks like a lot of consultants, which is wonderful. Some sustainability managers, energy managers and energy services, a couple of people from facility staff directly, property managers, marketing and sales. A lot of people in other so I'm interested to hear more about who that might be maybe in the Q&A that'll come to light.

Let's go back up at the top of this poll. All right, not surprising, yes, I'm hearing state governments in the chat. We are welcoming all of our state and federal and local government attendees as well. All right, good. Well, this is really helpful for us. And I think that we'll be able to address the different roles and perspectives of these audience members.

So we can go ahead and move to the second poll. But this one, we are looking to learn a little bit more about where your experience level is with EV charging. So are you completely new to EVs? Maybe you've joined us because you're looking to get the basics.

Is it something where it's in the process, or maybe you have already rolled out EVs on multiple properties and are hoping to gain some additional insight about where things might be going? This looks like a pretty even distribution so far, with maybe a fifth of people new to EVs.

But also, a lot of people in process so exploring, but have not yet implemented which I think is great, because the balance we have today of technical analysts, and also owners and operators, for those initiating anything will be really helpful. All right, excellent.

Well, thank you so much for answering these polls. This is really helpful; I think for our panelists. And again, you're going to continue to use Slido and you can switch back to slides, but you're going to continue to use slido.com that same event code DOE in order to submit questions.

We encourage you to submit questions during this whole session today, and then we'll be able to answer some of those at the end of the session. And if you are on slido.com you can also again, push that thumbs up it will be popular questions to talk about.

So today we have three wonderful panelists. We have Sue Vickery from Periodic Consulting, Jesse Bennett from the National Renewable Energy Laboratory, and Angela Keckler from AvalonBay. So with that we're going to start off with Sue.

Sue Vickery provides consulting services to multifamily developers and equity providers. Her services include development plan review and interior design services, as well as value add project management and acquisition underwriting due diligence coordination. So Sue thanks so much for coming today. And go ahead and take it away.

Sue Vickery:

Absolutely. Hi, everyone. In addition, I'm currently working on just under a billion-dollar portfolio of development. And this is a really hot topic. So I'm very excited to kind of give some insight into why you need an electric vehicle charging station and why you should be paying attention to this right now.

So I guess we can get started. So what's coming and why you should prepare? Right now, there are about 38 new models of cars coming into the market on an annual basis on average. There are only 37 existing hybrid vehicles.

So some of the resistance that I see out there is there's just not that many vehicles out there that require charging and probably where your charging stations are if you have them existing, there's not a whole big fight for them at this time. And so now the question is do you bother expanding? And how do you do that?

So only about 5% of the US market is even hybrid. So next slide. But even more interesting is there are only 19 electric vehicles, fully electric vehicles available in the market right now. And as you can see by these brands, most of them are very high end. And they're pretty expensive. Next.

What's interesting is what's coming in the next two years. 59 new all electric vehicles are coming to the market in the United States. If you look at this slide on the left, you'll see the little bitty brand icons are brands that already have an electric vehicle in the market. So it's not very many.

Then the medium sized ones that you see are brands that are existing that will be releasing their first ever electric vehicle models. And then on the right-hand side are brands you've probably never heard of.

And these are national and international brands that are coming to the market for the first time with very interesting offerings for electric vehicles, including fleet vehicles that will ultimately jump in with Amazon, for example, or even UPS who will move

eventually from gas to electric. So there's a lot, lot more coming. Next slide.

These are the companies who have said that their business plan includes going all EV by the year 2030, that is eight years away. The ones in red, with the exception of the Chevy Bolt don't even have an electric vehicle in the market right now. But those have all pledged to go completely EV within the next eight years.

Ford, while they're not on this list to go all electric, 40% of all their models will be electric by 2030. And GM, which is Chevy, Cadillac, Buick, and GMC will put out 30 new electric vehicles by 2025. And what's interesting, I'll bring it back to the other earlier point, right now we're getting 38 models a year, new models a year and GM is saying they're going to put out 30 that are electric by 2025.

It's also PHEVs for that question. Next slide. So understand, we've got new companies coming in from all over the world. So Japan, China, Croatia, that company was purchased by Hyundai in Vietnam you've never heard of have electric car market sometime elsewhere around the world. And so they're launching here in the US.

The – Sorry, it just that my connection is unstable. The costs are pretty accessible now, and are just going to get more accessible as time goes on. So about 27% of current hybrids and of upcoming EVs are going to be under \$45,000. So they're of course they're still luxury brands, but a lot of the vehicles are going to be well accessible to folks who are buying new vehicles.

Add to that, that there's a tax credit of \$7500 for folks who buy electric vehicles that excludes Tesla and Ford, and so little trivia there, the reason for that is once you sell 200,000 electric vehicles your brand no longer qualifies for that tax credit. So eventually, all these tax credits are going to, I guess filter out over time.

Another interesting trend is right now the average range of existing electric vehicles is 242 miles on a single charge. But over just the next couple of years, that range is going to increase by over 60 miles. And what this means is road trips. It's not just a city car anymore, there's road trips, you can drive to Dallas and back from Austin on one charge.

So People are going to be looking more for where they're staying overnight, where they're stopping out of friends, et cetera, places to

plug in their vehicles. The IHS market forecast that an increase of EV share of the US market from what it is today at 2.3% to 32% over the next eight years, only plus 4% hybrid vehicles.

So you can kind of see that the hybrids are going to be filtering out in favor of all electric vehicles. And what's really impactful is UBS is forecasting that all new cars sold in the US will be electric by 2040. So not very far away, 19 years or so. No more gas vehicles. Next slide.

So things to consider. In New construction, for example, the deals that I've been working on, we've been putting in about one or two electric charging stations per floor on the garage, and then adding conduit so that you can easily expand, which is a really good strategy, even now, just to have the conduit so you can put in all the wires later on as demand increases.

And I know Angela's going to talk a lot more about the operational impacts of adding the charging stations. Retrofits are very expensive; they're going to still have to meet accessibility requirements. And obviously, the challenges are much more stringent in garage locations versus surface. So these are things that you have to think through.

And then going down the line future considerations, monetization, some folks are already doing that. And you can – Let me back up. Monetization is inevitable as gas is filtered out, because you're not just going to have it for free. Once gas goes out, then electricity becomes the greater commodity, and there will be charging for it.

So understanding that strategy and what your expectations are now, for the go forward is important. And also considering where you can put charging stations you can share with the public, either some or all so you can continue to add revenue source to your project as the EV market expands. That's it.

Hannah Debelius: Wonderful, thanks so much, Sue, it's so helpful to kind of step back and really start to understand what's coming down the pipeline in 10 years' time is really not as long as we sometimes think it is. I will say that I know we have a lot of questions coming into Slido which is great.

We will be drawing our questions from Slido not from the Zoom chat. So if you have a question and I hope you do you can put it on slido.com event code DOE, or if you're over there, you can go

ahead and hit the thumbs up votes on those questions that we'll get to first.

Next, we have Jesse Bennett, who's research engineer at the National Renewable Energy Laboratory in Boulder, Colorado, and has worked extensively on the intersection of utility industry and transportation, supporting fleet electrification and research on the impact EV charging will have on the grid. So thank you so much for joining us, Jesse and go for it.

Jesse Bennett:

Thanks very much, Hannah. And thanks, as well Sue for kind of introducing the justification for why we might be interested in installing EVSE at different locations, apartments included and why the overnight dwell period of the parking at your home location where you stay overnight is really helpful for getting all that charge back in the vehicles' battery. Thanks, Hannah, for the introduction.

As Hannah mentioned, I do a lot of work with the Federal Energy Management Program and National Renewable Energy Lab supporting fleet electrification and also understanding the impacts of EV charging on the grid. To begin next slide.

I just have a brief overview here of kind of the steps that I typically work with fleets and understanding what's needed for electrification and specifically EVSE installation.

And as Sue outlined the first key element, truly understanding the vehicle demands and the needs and we can get into a little bit difference between PHEVs and BEVs but understanding what vehicles are going to use the EVSE or the electric vehicle supply equipment is really important.

And then determining which EVSE or charging stations are best suited for those applications is key. The next two steps I kind of think is working in parallel together, reaching out to your utility early is key and then understanding the necessary upgrades to support this new infrastructure is also important.

And that can be a two-part conversation where reaching out to them early to understand if they have any support programs that can assist you in your installation and planning and then also going through the planning process and sharing with them what you intend to install.

So adding the utility, what's going to be placed in and then once a good plan is installed and installers electricians are hired, construction can take place and the installation of the EVSE can then conclude.

So the next slide here it goes just as I mentioned, the breakdown, two comm applications for EVSE are what you refer to as level two pedestal style units that provide 208 or 240 volts to the EV. These are typically like your pedestal style or more permanent installation.

Then there's also the portable level one charger units a little bit lower power, lower voltage, they plug into your standard outlet for the most part, most common application here is the portable EVSE units cord set like you might see in the bottom right corner here that come with most vehicles.

And you can simply plug that into a typical wall outlet, and it can charge the vehicle rather slowly. But especially for the application of plug-in hybrid electric vehicles with the smaller battery capacities that they have great application for PHEVs.

And for the most part, many battery electric vehicles are BEVs and all electric vehicles, those will typically benefit more from a level two pedestal unit. And this is typically what I advise most fleets to consider installing, especially when you're looking at outdoor installations and parking lots, level two pedestal units work out really well.

But if you go to the next slide here, the installation requirements for these EVSE are kind of the key first step. And most of that revolves around the circuit breaker in the protection, you might think of these as like your service panel with the breakers in your home, like it's on the right side of the screen.

You need to make sure that you have a circuit breaker that's rated for sufficient capacity based on the EVSE level. And then that panel and main breaker must also have the capacity to suit those needs. And not only the EVSE, but all your other loads.

And these are topics you can work with your electrician on. And then this gets into transformer capacity, which is where you work with utility and talk to them whether or not all of these new loads might trigger an upgrade on their side of things.

And just to break things down kind of simply level one chargers typically require a single pole breaker, a 20-amp breaker for about 15, 16 amps of charging and level two chargers typically require a double pole 40-amp breaker which then needs two of those positions like you might see on the right-hand side there's little rectangles in the service panel.

Each of those represents a breaker position. And it's kind of really easy to remember level one chargers typically require a single breaker position. And level two typically requires two breaker positions. So kind of easy to remember.

But if you get to the next slide, one of the key reasons you must understand all of this and work with your utility companies is all of the equipment across the grid must be designed to serve a location's peak charging demand.

And that's really why you work with utilities and let them know if any upgrades to your service panel are going to trigger any upgrades on their end or your end. And most often for utility companies, this could include for very large installations potentially new service lines or new interconnection but most common is distribution transformer upgrade if necessary.

And I have that list under both grid upgrades as well as facility upgrades because sometimes the line of ownership there, sometimes the service transformer especially with larger commercial buildings or say larger apartment buildings, that service transformer may be owned by the building manager and owner or it may be owned by the utility.

And working with utility and sharing with them the EVSE you're installing and after working with your installers and understanding whether or not a service panel upgrade is needed, that's really when you'll be able to have this conversation of what other equipment might be upgraded as a result of the new EVSE.

So onto the next slide here. All of these upgrades might seem like really confusing and overwhelming and a lot to get through and utilities are actually on top of this as well. So as part of EVSE being installed to support fleets and many of their multifamily dwellings and a lot of other different building types and charging needs, they're actually offering new service options as well.

So think your standard service option would be like where the utility company owns the transformer and the meter and then you

install your own panel wiring and charging station kind of similar with what goes on in someone's home.

But there's also what's referred to as EVSE Make-ready options where the utility company actually owns now the panel as well and they install their own conduit and wiring and all you as the facility owner have to deal with is the installation of the charging station.

So all of those breakers and wiring concerns and all of that is kind of taken care of from the utility side of things and then a charging station can easily be installed and typically what's referred to as a stub out where conduit comes up out of the ground and there's wiring there ready for a charging station.

Utilities are also just offering very simple EVSE rebates where they're making EVSE and charging stations a little bit more affordable. You can get some money back, just to support the deployment of charging stations and utilities are very interested in the transition to transportation consuming electricity.

They're very excited and interested about that. But they also want to plan for that and support that transition as much as possible. And then there are a few times and locations where utilities are offering the full-service package, and there's a charging station that's actually owned by the utility.

And that's sort of a full-service option. That's not quite as common yet, but to potentially see that being offered sometime in the future. Next slide here.

And then also, we talked a little bit about all of these upgrades and the different costs for installing EVSE. You may see new demand charges, expensive upgrades, there actually are ways to incorporate with, you have smart EVSE, you can do what's referred to as smart charge management to say shift some of the EV charging within the vehicles dwell period.

It's a period where it has less of an impact. So maybe think about setting a power ceiling on all of your EVSE so they don't overload the transformer if you want to maybe avoid an upgrade or potentially shift it so then the peak demand does not add to your demand charges. So shifting load to an earlier period of the day, as well as favorable.

Obviously, this is leveraging the fact that EVs typically are dwelling for much longer than their charging requirements are. So

if you're parking overnight, maybe there for 10, 12 hours, you might only need to charge for three or four hours at best, especially if you're on level two.

So this smart charge management takes advantage of that. And if you click to the next slide here, at NREL's parking garage, we've actually implemented a smart charge management system and solution to perform just this actual benefits.

Where we installed 72 EVSE charging ports, expanding our workplace charging program from about originally 36 ports to over 108. So in potential peak demand at about 720 kilowatts with all those charges, which is quite a lot and would then require those transformer upgrades, which is rather expensive.

And something that would like to be avoided if possible. And what's nice is we have a lot of employees that are sitting at work for eight hours a day, and they have some flexibility.

So we incorporated a managed charging solution to the shift they're charging around times when it's not going to exceed that transformer capacity. We took advantage of the managed charging solution and had employees' input, how much energy they need and how long they're going to be there.

And then based off a few different other parameters, the control system is able to shift the load around within the day at times when we're not requiring those upgrades. So we could potentially avoid it and save a little bit of money on the installation. And then make sure that the program still serves all the energy needs of our employees. Next slide here.

And then the last topic, I've also worked a lot with workplace charging programs developments for federal agencies. And the same concept can be applied to what Sue was referring to is cost recovery.

And when you're developing if you do you want to pass on a fee structure to your different apartment dwelling and all the different users of your EVSE, I like to break it down into four key elements, the electricity fee or energy fee, the network fee so that that cost of the network fee that each of the EVSE must pay per year for that internet connection.

The unit fee, so the EVSE or the charging station cost itself and then how much it cost to install the unit. So breaking all of this

cost and distributing over the lifetime of the installations and how much utilization you have is really key to understanding how much energy and how much cost should you pass on to each user to make sure that you're recouping all the costs may not overcharging them.

Because definitely want your apartment dwellers to be at having an enjoyable experience. So next slide here, we've put all of this together as part of the workplace charging program guide that would apply very well two apartment installations as well.

And it's put together we have a calculator on the site down below that gives based on a number of different inputs that can be user defined, you can understand whether or not you want to charge for total session fee or an energy fee.

And whether or not you have, say, just like a 120-volt receptacle or a network level to station, you can see the different costs that break down across there. And it's a really valuable tool.

And I definitely would encourage anyone to check it out the more so than just workplace charging applications, as I mentioned department installations would also be helpful here as well. And I think that's about it. Next slide.

Hannah Debelius:

Awesome. Thanks so much, Jesse. I could tell that both of our panelists so far have had really great content to share because we are getting a lot of questions about whether these slides the recording will be available.

So I can assure you that we are recording this session and the slides and recording will be available in the Better Building Solution Center. And anyone who registered will get an email when that's available. So I'm glad to hear there's a lot of enthusiasm out there for the content.

I'd like to move to our final speaker for today, Angela Keckler who is the director of ancillary services for AvalonBay Communities where she creates new revenue streams, augment existing programs, and adds high value resident amenities including electric vehicle charging stations. So Angela, would you like to come on screen and move on with the presentation.

Angela Keckler:

Yeah, thank you. Thank you, Hannah. Hello, everybody, thanks for joining us this morning. I want to speak a little bit about retrofitting residential garages. I think that Sue did a really good

job of motivating us to be interested in this topic and seeing how adding EV charging at a community would be a really high value add resident amenity.

And certainly, Jessie has given us a lot of technical information. So I'm going to focus a little bit more on the practical side. I have retrofitted about 75 communities at AvalonBay in the last couple years with EV charging.

And so I also formally did some work with the parking assets at AvalonBay. So as you can imagine, there's a lot of interaction between – Can I have the first slide, sorry. There's a lot of interaction between the residential parking program and EV charging and trying to navigate that.

I'd like to talk a little bit about that. Then I'm going to talk about fair housing, and the implications of that for EV charging installations, and then a little bit about how to right size a community. There's a lot of change going on, too little change management.

With regard to residential parking, it's very important to understand that parking for multifamily is typically the largest source of revenue after apartment homes. So it's a big ticket item.

And as you think about installing EV charging, you really need to think about being careful about your parking revenue and not undercutting your parking revenue. Ideally, you add this value-added amenity and you either maintain or increase your parking revenue and actually recover your costs for EV charging.

So you want to be able to satisfy your demand. Because obviously, if you have customers are looking to charge at their home, you want to make sure that you can accommodate that. Otherwise, you might be losing leases and you know not getting the best rents.

The other thing is you want to think about future proofing, when you go in to do an installation, you do want to think about three to five years at least trying to accommodate that future demand. And the other thing is you have to really think about your parking supply.

So as you put any EV charging, you can't put parking out of commission for people that don't have EV, otherwise, you're going to have a problem with maintaining your occupancy at your community.

So lots of variables, lots of things that impact one another and kind of interact to think about, there are different kinds of parking configurations that you find in multifamily. There is open parking, which is ideal, right? Because you park wherever you pay a monthly fee.

And so it's easy to add charging in those environments. Reserved parking is more difficult, that somebody has that space and right to that space for 24 hours, you add a station there, then you've got only one person using that station, presumably.

And the most difficult is assigned parking and this is fairly common, especially in markets where people always have a car like California, where it's very, like car centric culture.

When you rent an apartment, you'll actually get a parking space with your apartment home like a particular parking space. That makes it very difficult to add electric vehicle charging, because if that person doesn't have an EV, you're really just wasting that resource there if it's installed in their parking space.

So this is the different kinds of parking on the slide here to think about and how that impacts what you're going to be doing. The other thing is resident charging preferences, what kind of charging are your customers looking for?

I like to call it the charging ecology. What does that look like for that market for that community? Are they looking for their own charging stations, sort of like the single-family model where they come home, they plug in, they charge overnight and they have a full battery every day when they're off to wherever they're going to the office?

Or are they willing to charge on a shared basis, which is more kind of the retail model, right? Where somebody charges for three, four hours then they move their vehicle someone else can charge.

And how much are they willing to pay for charging? We find that a lot of residents don't think they should have to pay for charging. And that's just not really a tenable model in the long term.

Electricity is expensive, the hardware you have to pay for that. So you've got software licensing fees. So you have to really think about what the customer wants and what you can do for them within your constraints. Can we go next slide, please?

So when you build a retrofit a community if it was built in 1991 or later, it is subject to the Fair Housing Act that was passed in 1991. And what that means is when you add any amenity to a community and obviously EV charging would be considered an amenity, you must provide an accessible version of that amenity.

So if you can see in the picture in the slide here that the space on the left, that's an accessible EV charging space, there are a number of things that you have to hit to like a checklist for it to be accessible. I'm not going to get into that.

But there is a list there on the slide, just things that are very common for handicap parking, but it is not a handicap parking space. That's very important. It is an accessible EV charging station. And the good thing about it is that anybody can use it, it has to be available first come first serve.

But you don't have to be needing an accommodation to use the charging station, you just can't rent that space out to a single person. Next slide. Oh, and one thing I did want to say about the accessible space, is that sometimes what you'll have to do is you'll have to down another parking space to be able to create an accessible parking space because it does require a five-foot access aisle.

And that can be difficult to find in an existing community, it just really depends. So that's another tension, right? Because you could down a parking space, you could lose that parking revenue.

So you just have to try to get creative and trying to find a space maybe next to a handicap parking space that you can use, you can share the access aisle. But the key thing is there that that has to be a shared EV charging station, it cannot be dedicated to one person to satisfy the accessibility requirement.

So the bottom line is if you can't put in an accessible station, you really can't do EV charging in that garage, if it's built in 1991 or later without violating Fair Housing. So something definitely to plan for as you do your retrofitting of your garages.

So, as far as right sizing your community, I'm just going to talk about level two charging stations. I know Jesse covered level one. And those are great, especially for plug in hybrids.

But I think mostly what your residents in a multifamily are looking for the gold standard, which is really the level two charging. And,

you really have to think when you put in the number and the type, what kind of demand do you have for charging, because you're looking at substantial capital costs.

If you do a network charging station, which is I'll just define that. So we know what we're talking about, which is a station that contains software that enables the station to connect to the internet, and you can monitor the usage and the set the pricing.

So it's like a piece of hardware that delivers electricity to a vehicle and it can be programmed, right? It's got software in it. It's like a computer. So the great thing about that is that allows you to charge per kilowatt hour you can really know what your usage is, you can put in penalty pricing.

I noticed somebody in the chat was like how do we get people to move their vehicle? Well, if you have a network station, you can basically set a penalty rate. So if they stay more than four hours, which is plenty time to get a full charge on most situations, you just double the price per hour for them to be plugged in.

So there are ways to manage customer behavior with the network stations. The other thing you have to think about is the software licensing fees. When you have a network station, you're going to be paying for software fees and maintenance. You can go the non-network station route, which is basically just a piece of hardware that specialized to deliver electricity to EVs.

Those are a lot cheaper, probably under \$1,000. But they don't really have very much flexibility. You can't charge for usage, you can't have several users, it's just a very limited applicability. You might want to use those for a dedicated station.

If someone wants her own station, they're going to rent a parking space, it's going to be their reserved parking space, you could charge them a flat fee to use that non network station.

But again, the people that preferentially are drawn to those stations are people that have very large batteries and drive a lot. So you're probably not going to break even if you charge them a flat fee to use that station for the electricity.

The other thing is if you do get network's level two charging stations, you want to make sure you have the OCPP Open Protocol that's allows you to use different software on the station so you're not locked in to one provider.

And that would be very important, especially if you have multiple communities so that you can manage them on the same portal and you can kind of consolidate your EV charging.

And as Jesse mentioned, I think he mentioned that universal plug, you definitely want to think about universal versus proprietary adapters. If you put in Tesla stations, only Tesla customers can use them, you will have to put an accessible version and as well for the Tesla. Better probably with all the new models coming out to move towards the universal plug.

And then you want to make sure your stations are dynamically load managed, which means that basically the stations talk to one another, and they distribute the charging across the station so that you can put in more stations for a given electrical capacity.

That's very important, because we're going to want to have a lot of stations if we're going to have a lot of electric vehicles and a lot of opportunities for people to charge. And we don't have usually we're not going to be adding transformers and putting in a lot of extra bandwidth for electricity.

So that's a big item, I think of importance. And then just I think I'm running out of time. But just finally, connectivity. If you're in a garage, you know how difficult it can be to get a cellular signal. So you just have to make sure that your network provider has a good plan for getting that cellular connection down there.

Because we'll need that for the stations to operate optimally. And then finally, just wanted to mention I did a lot of my almost all of my retrofitting with rebates through utilities.

And there are a lot of great programs out there that don't really encumber the properties and enable you to put in both infrastructure and charging stations at basically no cost, which is great, it's just a win-win situation for the owner and for the resident. That's what I have. Thank you.

Hannah Debelius: Excellent. Thanks so much, Angela. I really appreciate you talking about so much of the actual implementation and choices that are in front of operators. No wonder we have to have a full webinar on this. Excellent. So we're going to move over to the Q&A section.

So I would like to invite Jesse Sue and Angela to meet again on video. Thank you so much. We've had a lot of questions in here, in fact, so many that we probably won't get to all of them.

So I would encourage you all to go ahead and use that thumbs up button. Because as you can tell on the screen, the more votes a question has, the higher up queue the more likely people to get to it.

Spending the next 15 minutes addressing these.

Sue Vickery:

And Hannah, I want to make one correction that someone pointed out. It is GM where you cannot get the EV credit not Ford. So Tesla and GM after 2020 you cannot get the tax credit.

Hannah Debelius:

Great, thanks so much, Sue. Yeah, someone had put on the chat so I appreciate that that's correct. Excellent. So the first question we have here is how do we as manager, owner of apartment communities, charge residents in detached garage buildings? A flat fee per month, new submeter, et cetera.

Maybe I'll start – Angela, do you want to start with this question? And then maybe Sue can add to it.

Angela Keckler:

Yeah, I mean, I think you could put a charging station like a non-network station in a garage. And you could charge a flat fee. I think that would probably be – I mean, you could just put it like a stub out in there with a plug. And they could put their charger in.

I mean, that would be the cheapest solution if you only have like one user. The problem with that from an owner standpoint is how are you recovering your cost? Like it's not that expensive, I mean, you put the conduit in and stuff you got to think about recovering those capital costs but on a monthly basis, you really don't have control over who's charging there and how much charging they're doing.

What we've done, well, we have some communities that just have like the plugs, essentially, you bring your own charger, and it's level two, and we have a calculation of like what an average driver drives and we just kind of figure that out.

And use the kilowatt hour price at that community for electricity and try to like estimate. The problem is like I said that's a great deal for someone who drives more than average, that's the thing that you're not necessarily recovering your costs.

And then what if you have like roommates or a couple, and they both have EVs and they're using the same plug, then you're like, getting half as much or, I think the way that things will be going as

some kind of metering so that you can know what usage is happening in your community. And I mean, obviously think electricity is probably going to go up if everybody is charging vehicles.

So we need to be thinking about that as owners so that we can recover our costs. And I don't really see EV charging as a great revenue source, I don't really think that's the appropriate way to think about it, I mean, electricity is what? 17 cents a kilowatt hour or 20 cents per kilowatt hour, or how much are you going to mark it up so that you're going to make a great amount of money, you're not.

So, the way to think about it is being made whole as an owner providing a great experience for your customers. And so I would say you could start out with an outlet that has like very little capital costs, you could put in a net non-network station, and charge a flat fee.

Sue Vickery:

I would add to that, that, when I think of detached garage building, I actually think of a detached garage that's potentially assigned to a unit. I think that there is a potential to monetize the convenience. And it may or may not be about the electricity.

So for example, somebody has a nice car, they're probably going to pay up to get one of those garages that are on your property. If you add a level two charger in there for somebody's Tesla, or their new F150, or whatever it's going to be, then you add a lot more money to that convenience in that garage that has anything to do with how much electricity they're using.

So think ahead on the amenity itself, and how you look at how amenities are priced. And not just about trying to recoup your electric fee, because there are going to be meters, the charging stations themselves are going to get more sophisticated just like a gas pump, where you know how many gallons you're getting and how much you're paying per gallon.

Eventually your charging stations are going to have a similar function where, okay, as soon as I'm charged, it's going to turn off and then it's going to charge you for exactly how many kilowatts that used to charge those types of things. And those are already in development. So I would just say, charge for the amenity use that mentality and you'll get a lot higher revenue stream off of that.

Jesse Bennett: I would couple that maybe just to add one other thing and there's a question about how electricity might become more expensive. And something I didn't mention about the ENRAL garage is one of the things is the shifting of the energy in the charging is actually done to one mitigate upgrades but also to mitigate demand charges which is an element of your bill that if all of the vehicles are charging at the same time could increase electricity costs.

But you can mitigate that by having a lower demand profile. So think instead of 10 vehicles charging at once have them all charged at different times of the day. And the way that you can ensure that possible is through we actually have a fee structure and relevance adaptive and the more flexibility that a charger or a driver request so if they have a small amount of energy over a longer period of time, they're actually offered a cheaper rate.

And if say they want like an hour's worth of charging and they're only going to be there one hour they have a more expensive rate because our control system has less flexibility to shift that around and reduce the energy costs.

Hannah Debelius: That's all really interesting. I'm glad each of you touched on other ways to think about financing or charging for it because I know that a lot of our questions are around EV as a potential revenue stream and how to price that.

Excellent so we'll move on to the next question here which is what are the best options for financing EV infrastructure, getting a building EV ready for apartments? Maybe Sue, do you want to kick this one off?

Sue Vickery: Interestingly, it's obviously going to be different for a new project versus say an existing one. And Angela is probably better suited to answer this type of question about incentives or how best to finance it.

But we thought we being our TCR projects just finance it through the standard capitalization of any project. One thing that I think is important to mention here is if you haven't heard about it already, a lot of investors are looking at what is your ESG plan and having your EV chargers as part of that plan, investors are already wanting to invest in improving energy usage and speaking to the environment.

And so getting those expenses approved either through an operational budget or a development budget, it's already getting

easier and easier because those questions are being asked by the investment community as it stands.

Hannah Debelius: Thanks so much Sue. Angela or Jesse, would either of you like to add to that?

Angela Keckler: I would just definitely look at the rebates that are available through the various utilities, I mean, there's a great one in LA, LADWP is the utility, there's a new one coming out for Southern California Edison. There's one in New York Con Ed, which pays for a lot of infrastructure.

If you're in a disadvantaged area, it's 100% reimbursement. And you can find contractors that will take the rest of the rebate, do the work for you, they get the rebate money, and you really are no cost to no risk do the installs.

So I would definitely just do some internet searching on different programs through the utilities and see if you can get some assistance from them. The thing to be careful with, some of the utility programs want to kind of intrude on your ownership rights, so you have to be careful of that.

But there are a lot of programs that are great out there. And they really just are hands off, you might have to report some data to them. But they're not like putting an easement on your property or anything like that. So definitely look at the utility rebates.

Hannah Debelius: Great. Thanks so much, Angela. And I would also be remiss if I didn't mention the Better Buildings also has a finance navigator. It's a great tool for financing a variety of energy efficiency reduction projects. Jesse, you unmuted, so something to add on that as well?

Jesse Bennett: Yeah, just one thing. Another resource the DOE puts together is the Clean Cities Coalition and reach out to your local Clean Cities coalition. I know a lot of those coordinators for the Clean Cities in each local area are really helpful and very knowledgeable on the different incentive programs and the best approaches for installation for EVs in the area.

Hannah Debelius: Excellent. Thanks. Angela, your last response actually dovetails well into our next question here, which is how big of a driver in the cost of installation and failure to adopt with both new construction and existing properties? With that in mind, who do you think is

best suited to help alleviate those costs? Government? Utility?
Energy supplier?

Angela, since were just mentioning utilities, you want to start us
off with this one?

Angela Keckler:

Well, I'm not really a public policy expert but I guess I can opine
on that. I really think – I mean, I think a lot of the problem with
like, putting in EV infrastructure has to do with all the free
charging that's available at workplaces in retail. It's created, like, a
perturbation in the marketplace.

So if you knew people needed charging, and you knew exactly
what they were going to be using, then you could scale for that,
right? But like, a lot of people get free charging at work. So then
what do they need when they come home? Some people don't have
that. So it's hard to plan.

So I think that is, I'm not sure how to alleviate that problem. I think
that's one of the biggest drivers of uncertainty in the marketplace.
It's like, Tesla has free charging for some of their customers, right?
At superchargers.

So if there's a supercharger right down from your property, and
you want to do EV charging, you're like, great, let me put EV
charge again, and they're like, I don't want to pay for this, I can go
right down the street and get free charging.

So the ecology is not quite settled, I think it'll be a lot easier as we
get a lot more vehicles and a lot more demand. So I don't know
where that failure comes in. I think it's just like, trying to
incentivize people, then it kind of messes up, like how we can
service them.

And so whoever did that, whoever put in free charging, because it's
just –

Sue Vickery:

Stop it Elon Musk.

Angela Keckler:

I know. It can't be free. Nothing's free. So you have to like, I think
that's a that's a difficulty. I mean, it might have been unnecessary
evil, but it does make it hard. I think the ecology is hard to figure
out, especially in certain areas. I mean, I have workplace charging,
it's free, like, of course, I'm going to use that.

Jesse Bennett: And I will maybe stay on top of that. I think one of the reasons that a lot of this comes down to and I guess maybe the question here is, what is the adopt term in this question referring to but I think in terms of the utilization of EVSE is really a key metric here.

And I think a lot of initial EVSE programs, especially workplace charging programs, the utilization was so low recouping and the receiving of money was almost more of a logistical challenge than it was worth that those low utilization rates. But I do think long term, as utilization ramps up, that's when things can potentially have the potential for profitability or just even bring back costs at a reasonable rate.

And that's really, I think, when things will even out but yeah, I think the main reason for this free charging offering is a lot of low utilization rates, making it just not worth the effort to collect the costs.

Sue Vickery: So I have unpopular opinion, what I want over here and that is, this is a very short term question. If in fact, all of our EVs is everything's EV in the next 10 to 19 years, it's irrelevant. It's like, are you going to have a clubhouse at your community? Are you going to have a pool? You are and you'll pay for it.

And this question won't be as relevant. And so I think right now, understanding what rebates as Angela was talking about and just programs is important. But as more vehicles come out – Elon is not giving away free electricity forever, he's got the majority right now of luxury vehicles that cost a ton to buy one, it's only right that he should let you charge up for free because of what he's charging for his car.

So, as things get more mainstream, and that cost comes down, it's just going to go free market just like everything else did. And the cost to install and maintain, et cetera, are just going to come right on down, and it's just going to be part of everyone's normal lives.

Angela Keckler: I agree with that. And I think it'll be so much easier to monetize the station. So we have a lot of demand, we're just in this like, very difficult position where we don't have a lot of demand, we have pretty high capital costs if you're not getting a rebate.

And you have operating expenses to pass back to the customer too so it doesn't make it very attractive if they have to pay all the software licensing fees and the electricity and pay for your station.

Whereas if you can get a lot of people charging, you can bring the public in, like I think Sue mentioned that, that's a great idea. You get a lot more people using one station, then it becomes more profitable and it makes sense.

And so I think we are kind of just in this like hard period where we need incentives to put it in. But eventually we'll get to where we have a lot of usage and it'll be easier to manage the costs.

Sue Vickery:

One other thing that I think is interesting to input here as well is there are several models that are coming out in the electric vehicle market that are subscription based, which means it's like renting a scooter, you just go and pick it up and you rent it for a time and you drop it off wherever pick up another one.

And so that's going to be another factor in where you put your stations, who else using them, how you charge for them. So that is a whole new world that's opening up as well very soon within the next 24 months.

Hannah Debelius:

Great, thanks so much, everybody. And unfortunately, we are actually only three minutes for the top of the hour. So I'm going to move to our concluding slide. But we had incredible participation for our audience on that. So thank you so much to the audience and a huge thank you to our panelists.

You all brought an incredible amount of information and insights and really key decision points. That if you all, as you all have pointed out are going to be just increasing in priority over the next 10 years. So thank you so much for panelists. For audience, as you know these webinars are part of the Better Buildings Webinar Series, and we have a great lineup of presentations through April.

So I hope that you will join us for more of those. In fact, you can join us on October 19th for Planning For The Future: New And Improved Pandemic Protocols. That's the next slide.

So join this webinar to hear from experts as they discuss increasing preparedness and enacting responsibility operations that can reduce energy scale. Next slide. If you're interested in learning more about the topics discussed today, I encourage you to download our additional resources handout from the Zoom chat box.

The handout contains links to resources from Better Buildings and our speakers will also be sharing the slides with attendees and anyone who registered for this. And with that I would like to thank

again our panelists for taking the time to be with us today and sharing all of your insights.

As you can see, you can reach out to us with our contact information, but also encourage you all to follow Better Buildings on social media platforms you can find on the left there.

And another thank you to the National Apartment Association and James Campbell who have helped put this webinar together and in partnership with us. So thank you all so much, and I hope you have a great rest of your day and a lot of success in your EV charging.

Angela Keckler: Thanks, everyone.

Jesse Bennett: Thanks very much.

[End of Audio]