

Leap in MIP Resources

Speaker 1 ([00:00:15](#)):

Good morning everyone. I know some folks will join throughout our time together, so we'll just kick it off so that we can start it off and stay on schedule. Welcome to LEAP into M Resources and thank you for joining us today as we share fundamental information about the Microgrid Incentive Program and connect you to technical service providers as potential resources for your project. As a quick note, this webinar does not constitute an endorsement recommendation or approval of third party products, services, or any other offerings. Pge is not liable for the content or offerings presented by participating technical partners.

Speaker 1 ([00:01:00](#)):

This meeting is also being recorded. Just a few quick flags for our time together today. You do have control of your camera and Mike, but we ask that you please remain muted unless it's your turn to present or you have a question during our q and a time, we'll be doing our best to adhere to the outline timing, and we'll take a short coffee break in the morning and a lunch break at noon. We encourage you all to use the q and a function throughout the webinar, noting who you're directing your question to, and we'll do our best to keep an eye on the activity there. The chat function should only be used if you need to tag somebody in a comment, and we of course expect that everyone will prioritize respect for others in this forum today. With all that said, let's get started. I'd like to introduce you to Andrea Schumer, pg and e's Principal Resilience Coordinator, and Jeremy Donnell, pg and e's senior Manager, microgrid Strategy and Implementation. Andrea, will you please kick us off?

Speaker 2 ([00:02:02](#)):

Yeah, thanks Jesse and good morning everyone. Happy leap Day. Yeah, as Jesse mentioned, my role is the resilience coordinator for the Microgrid Incentive Program, so I act as liaison between you and pg e's technical teams to advise on the design of a community microgrid project. So I'm glad to see some familiar names here and hope we've created a webinar that will help you understand the program better and also give you the chance to connect with various vendors who can support you with development of your MIP project. To kick us off, I want to share a safety message and advance this slide. Thank you. So today I want to offer a reminder about being prepared if a natural disaster might happen and the importance of creating a supply kit to keep it home and maybe even in your car so you have items that could help you survive for a few days of stuck without basic services.

Speaker 2 ([00:03:06](#)):

So on this slide, we refer to a link on our website that provides a lot of details about what to include in a supply kit plus how best to prepare for any emergency. Okay, our agenda slide. So yeah, here it's our agenda for today, and as you look over it, I just want to reiterate what Jesse said that this webinar is being recorded. We plan to post the recording on our MIP webpage so that it can be a reference for communities as they plan to apply and develop a microgrid. So we thank you all for attending in real time and you're the special ones that can ask questions and provide feedback that others can access in the future. So please put your questions in the q and A function so we can answer them today. Okay, next slide.

Speaker 2 ([00:04:03](#)):

And one more. So I'm going to begin by touching on the main goals of the microgrid incentive program. So microgrids serve as a vital layer of protection to ensure that communities continue to have power when the broader grid is down, and some of the benefits are increased electric reliability for communities that have a higher risk of outages such as PSPS events, backup energy source for critical services, fewer impacts for disadvantaged and vulnerable communities like those who rely on power for medical needs and also reduce GHG emissions through deployment of renewable technologies. Okay, next slide. So this slide covers the funding that is available through this competitive grant program. So the Microgrid Incentive program provides up to \$15 million per project and two funding buckets. So one covers up to 14 million for the bulk of the cost of a microgrid including front of the meter batteries and generating resources.

Speaker 2 ([00:05:16](#)):

Also all engineering studies and project management costs and even potential costs to purchase or lease property for the project. The second funding bucket is for interconnection related costs up to 1 million per project. So this allowance will cover costs related to the studies needed to interconnect the generator to our grid and any upgrades pg e must make to enable that interconnection. And then I want to note that if an applicant is awarded a MIP grant, pg e will automatically cover up to \$3 million per project for the pg e equipment that would be necessary to enable safe islanding of a multi customer microgrid. So by safe islanding, I mean that the microgrid can disconnect from the grid to provide backup power during an outage. So the type of equipment we consider under these special facilities costs are things like isolation devices, the microgrid controller, and even undergrounding if that's necessary to create the microgrid boundary.

Speaker 2 ([00:06:22](#)):

So this means a project could receive as much as \$18 million. I also just want to point out that if an applicant isn't awarded MIP funding, they are still eligible to apply for the special facilities cost offsets up to that \$3 million to pay for the pg e's distribution upgrades. So our team will also still be on task to assist with the development of the project if you choose to go forward without AMIT grant. Okay. This slide here outlines the eligibility criteria of the program. So representatives of tribes and local governments in partnership with developers and community-based organizations are encouraged to apply. So the microgrid must serve a community that is considered both susceptible to frequent outages and disadvantaged and vulnerable. So the criteria for both of these are described here, and I'm just going to go over this very briefly, is outlined on the box here on the left side, this is the locational eligibility, which includes areas with high fire risk and those that have experienced public safety power shutoffs. Another focus for eligibility is those locations on our circuit which have low reliability as outlined in our annual electric reliability report. And then high earthquake risk is another criteria. So finally, if your community doesn't fall under any of these categories, it is possible to apply if you obtain a letter from your local government stating the reason it's important to bolster resiliency in the region.

Speaker 2 ([00:08:04](#)):

And then looking at the right side here, this box focused on disadvantaged and vulnerable communities. You can see here the four categories and you can also check whether your community is eligible by plugging your address into our MIP eligibility map that's found now on our website. There's more information provided on the map that defines each of these four categories. And just keep in mind this is a competitive grant program, so eligibility is the first step in the process. Okay, next slide. Okay. Yeah, so I just really wanted to provide a general overview today on the program and for more details, please

refer to this comprehensive handbook. It's your resource for all aspects of the program processes and application requirements. So I highly recommend reviewing the handbook, which is also on our website.

Speaker 2 ([00:09:10](#)):

Okay. This slide shows where we are now in preparing for our first application window and also it shows the dates for future application tranches. So starting from the left here of the slide, we launched the program back in October and went through the initial consultation phase, which is when we started talking to communities about their ideas and helped to determine whether projects met the eligibility criteria. So yesterday, February 28th was the deadline for eligible communities to inform us that they plan to advance into the technical consultation phase, and this is when we will conduct in-depth conversations with communities and their technical partner and provide engineering support. We set these deadlines to help manage all the intake and to give enough time for us to work with the teams to provide guidance on their microgrid design. These two consultations are meant to help prepare applicants to gather all the necessary information and materials plus refine their designs before we begin accepting formal applications by the deadline of April 30th.

Speaker 2 ([00:10:24](#)):

So we've established the dates for our second and third application windows, which will run along the same timeframes as our first window. So for those of you that were not ready to apply this April, you should have ample time to find your technical team and start working on your design. So you're ready to engage with us when we start the next round of initial consultations in early fall. And with that, I will see if there's any questions and also hand off to my manager, Jeremy Donnell to cover some additional program information. Thank you so much.

Speaker 3 ([00:11:02](#)):

Thanks, Andrea. Okay, good morning everyone. My name is Jeremy Donnell, I'm senior manager for Microgrid Strategy and I implementation at pg and e. Looks like we're doing great on time. I'm going to try and keep that up and get through my section as quickly as possible so that we can get into the heart of the programming. After this, we'll have Dana Boudreaux from Road Coast Energy Authority come and explain some of his experiences around having actually gone through the community microgrid development process, which I think should be enlightening for folks. And then we'll get into the heart of the program with vendor presentations. I'd also just like to thank everyone that are in the potential applicant pool who have joined this meeting. I know it's an investment of time, but we are hopeful this will actually help you really kind of understand the landscape of vendors and how to matriculate through the program.

Speaker 3 ([00:11:59](#)):

And I also want to give a special thanks to the two dozen plus microgrid vendors who have agreed to come and present on their services today. I think making these connections is very important to the success of the program, so thank you. Next slide, please. So what I'm going to do is talk a little bit about a framework for thinking about the development of community microgrids. Really it's a long process and so there's a lot of steps if you don't think about and do this every day, it can be quite confusing if you do think about and do this every day, it can still be quite confusing. So let me try and help set the stage here a little bit. First, just grounding on what a community microgrid is real quickly. It's a microgrid in and of itself is a section of the grid that can isolate from the broader grid in the event of an outage, and then that individual portion of the grid that is isolated can operate independently.

Speaker 3 ([00:12:59](#)):

And the graphic that you see here, it's basically the little orange dots would represent points where the grid, which is the blue lines, would isolate from the rest of the grid. Well, the blue lines are the ones that are energized. The yellow lines are the ones that are outside of the micro grid. It would not be energized. In order to make that possible, you need an energy source within the micro grid and the appropriate controls and protection devices, et cetera, in order for a small portion of the grid to operate completely independently. Microgrids are generally deployed for a range of reasons, but in community microgrids we largely see them to focus on critical resources and that's the critical facilities and that's the key component of this program is trying to target critical facilities as well as disadvantaged and vulnerable customers and their residences. So things like hospitals, police and fire stations, gas stations, markets, all of those would qualify as critical services that become very important to a community in the event of an outage or some sort of natural disaster or whatever event is going on.

Speaker 3 ([00:14:04](#)):

Now, what is a community microgrid? A community microgrid is unique in that it is essentially a partnership. It's a partnership between a local community and the distribution utility. Essentially the distribution utility brings our wires. The local community brings distributed energy resources, and those two are married actually to create a microgrid that can operate independently. So the community or some partner of theirs that they've signed up with will actually own and operate those distributed energy resources. And in blue sky days, as we call 'em, the 360 plus days of the year when the grid is operating, just those DERs are for the community and their partners to figure out how to use them. Maybe they're being used to generate clean local energy. Maybe they're generating revenue in the ISO market. They're being used for other purposes on all those other days. But then when there is a grid outage, we have a set of rules and protocols, et cetera that go into place to allow us to partner to say, okay, now let's switch your DER over to focus on energizing this local area. We will isolate the grid and we'll handle all of the wires components, and then the DER is actually served to provide energy in that footprint. And so it's truly what a community microgrid is a partnership. A microgrid is a technical, physical being a community aspect is the partnership and the ownership structures. Okay, I think I've beat that horse into the ground. Next slide please.

Speaker 3 ([00:15:50](#)):

Okay, so actually developing a community microgrid is a long process and so many of you have probably seen this slide before if you're actually already engaged in the med program, and we've talked to you about a five step process, and this is really through the pg e community partnership lens that we framed this process. So it talks about its initial step is our consultation with you, resilience, consultation, technical consultation, preparing an application. Then we go into the application stage where pg e is reviewing what you've put in and ultimately signing an agreement. And we go into interconnection studies, island studies development, stage four implementation plan, so on and so forth. You can read the slide.

Speaker 3 ([00:16:40](#)):

That's one way to think about the program in terms of your interactions with pg and e, but in order to do all of this, you're actually going to need help. You're going to need to engage with parties such as those that will be presenting on this call. And so what I wanted to do next slide please, is to provide a kind of rough high level way to think about your engagement with those third parties. So this is a simplified vendor partnership lens between the community and the vendor. And so this is very high

level, but it's useful for the framing and it's very simplified, but it's useful for the framing of today's presentations. So on the front end you're going to have project origination as a large bucket, and that's a party that will help you develop the basic concept, potentially work through things like project management, land acquisition, permitting, a lot of the front end stuff. You will also need someone who will be able to help you with the engineering procurement of project components and potentially even project o and m. Those are all things that are required. And then ultimately these projects will need financial structures to support all phases. We lumped those into three buckets, origination, engineering, development and operations and financing. We lumped them that way simply for the purposes of grouping the various presenters who will present today.

Speaker 3 ([00:18:17](#)):

I want to be very clear, the parties presenting today do not sit cleanly within one bucket or the other. Many of them will provide multiple aspects of the development process. There may even be something that we'll do. Everything end to end we'll find out today as they're presented. But for the purposes of today, what we're going to do is we're going to walk through those parties. That said, our biggest focus is, or our biggest expertise is project origination, and they listed that as first and then we'll have a second bucket where folks said that it's engineering development and operations. And then finally financing. You may hear some of them get on and say, I reject the notion that I had to pick one over the other, and they really believe that they can do all and that's fine. We forced them into choosing one bucket or the other so that we could segment 'em. So that's kind of the run of the day in terms of how we're going to structure it. Next slide please. I can't remember if I have one more.

Speaker 3 ([00:19:23](#)):

That's it. So I'm going to pause and just see if anyone has any questions about what I just described with respect to what a community micro grid is or the run of the day and how the vendors will be presenting. Before we get into the heart of the meeting, please feel free to raise your hand if you have a question. I'll hold for just like 15 seconds to see if anyone would like to. Okay, great. Hopefully everyone followed along and I didn't lose everyone. The pg and e side of this presentation is almost done for the whole day. I'm going to hand it off now to our CE. I'll introduce Dan in a moment. I'll come back to do just one more slide afterwards. Then we will proceed into a short break and then from there on the microgrid vendor community, we will have the run of the day, but so with that, I'd like to introduce Dana Boudreaux of Redwood Coast Energy Authority. Take us away, Dana.

Speaker 4 ([00:20:43](#)):

Thanks, Jeremy. Can you hear me all right? Oh,

Speaker 5 ([00:20:47](#)):

You Ian.

Speaker 4 ([00:20:50](#)):

Alright. I'm with Redwood Coast Energy Authority. We're in Humboldt, which is the far north of California, and we had the good fortune of putting together the first front of the meter microgrid in pg e service territory. So we're going to walk you through some of the backbone of what that looked like. And as far as the MIP program itself, we actually were participating in helping to develop that framework as we went. So you won't see elements of that particular process, but this will at least show what it's like to put together a microgrid in the first place. So today we're going to go over what worked

well for us, what we'd like to do differently, just to have a retrospective of where we're at today and then a brief look ahead. Next slide please. So just starting off, one of the things in our agency's favor was that we have a history of successful local energy projects and strong community engagement.

Speaker 4 ([00:21:48](#)):

We spent a decade building credibility and reaching out into the community to develop understanding and awareness of the need for renewable energy, reliable energy resilience, and frankly, we're a rural isolated community, so we have an ingrained awareness of the need to be as sufficient as possible. We're not an energy, we're almost at the end of the pge service territory. We do have one loop back so we can get isolated fairly easily. And our periodic disasters remind us that services such as our airport and the Coast Guard are essential for rescue and recovery efforts and just for basic economic and economics and wellbeing. So we clearly understood the why of the microgrid, so that allowed us to move on to the how of the concept. Then it just came down to core project management principles of having clear objectives and deliverables, a good team and realistic funding.

Speaker 4 ([00:22:46](#)):

Just a reminder there at the bottom there, back one slide just for a second. As Jeremy said, these are complex projects with long timelines, so you have to pay attention to that and be ready for change. Alright, next slide For us, the community benefits at the high level really boiled down to having the advantages of local renewable energy generation. It gave us an opportunity to decide what kind of generation where it was located, and again, it gives us resilience. If the grid does have outages, it's helped us on our path toward decarbonization for our community and the state in general. It builds resilience for our critical facilities. It helps to stabilize rates as much as possible and it helps to prepare for a distributed energy future. And these slides will be made available at the end of the workshop through pge. Next slide please.

Speaker 4 ([00:23:47](#)):

One thing you'll note is there's an appendix at the end that talks about our project objectives and just want to note those are really essential to make sure that all of your stakeholders are on the same page and you can sign up and get commitments on those so that they can, as the project gets very long-winded, they can hold to those commitments. So we had fairly broad sweeping goals to innovate and develop numerous topics including the partner relationships, market participation, regulatory compliance and so on. So do take a look at the appendix to see the number of objectives that we specifically laid out. So just to give you an example here of the particular topology of our project, it's a battery and storage, sorry, it's a solar plus battery storage facility. You can see the diagram on the right. That's a conceptual drawing. It was 2.2 megawatts of PV array and 2.2 megawatts or 8.8 megawatt hours of battery storage.

Speaker 4 ([00:24:45](#)):

And it has two main goals here. One is blue sky operation where we sell onto the wholesale market to help defray our financial cost and have a return on the project. And the other part is during black sky conditions or outages so that we can operate the facilities, we have an interesting arrangement with our county. The area under those blue array lines on the right, it sits on 10 acres of land and we lease that from the county, but the lease arrangement is that we give them electricity. So we have a commitment to provide them with the first five rows there provide 300 kilowatt of power and so that arrangement of feeding power to the airport daily serves in lieu of a lease payment. So that actually was a great

relationship particularly for an airport which specifically needs to generate revenue. So as a county or city or other agency is looking at how do they utilize their assets and ensure they get return on value, this is actually a great way to help stabilize their rates and give them reliable renewable energy.

Speaker 4 ([00:25:56](#)):

It also helps 'em to achieve their climate goals. So they should see motivation and benefit in this activity we have microgrid controllers to allow the system to island so when the grid goes down, our system will seamlessly kick in and it will generate, provide power for about 22 meters. Again where the distribution isolation switch is connected. We simplified our project a little bit by putting it at the end of a feeder, so that helped a lot. We don't have to have additional isolation switches further upstream and so all meters after that isolation switch gets energized during outages. We also are installing, haven't gotten to it yet, but I hope this year we're putting in EV chargers so that we can then demonstrate load shedding and tinker with the idea of vehicle to grid integration. Next slide please. So let's take a look at our project partners.

Speaker 4 ([00:26:53](#)):

We're really fortunate just off the bat, California Energy Commission is a fantastic advocate to have on your team, particularly for funding, but also to make sure that you're innovative and keep your project planning on track. We're a really interesting structure as a team. Redwood Coast Energy Authority is a local community choice aggregator, and so we're working with pg e as an investor owned utility in this space to figure out the grid transformation. How do we deal with generation moving into a distributed framework while still respecting and working with transmission and distribution requirements? So that proved really essential to help understand some of the dynamics of the different business partners, goals and objectives and constraints. We have the Schatz Energy Research Center, a university based foundation at the Humboldt now Cal Poly Humboldt facility and they are instrumental, they've been a long time innovator in the energy space, so that was also extremely helpful for us.

Speaker 4 ([00:27:59](#)):

This all merged together to create a team that can make this happen. We also had the county of Humboldt who certainly based on floods, fires, earthquakes and so on, recognize the value of our airport and Coast Guard. Were certainly advocates and we also had other ancillary businesses, TRC, Tesla, Schweitzer Engineering and the Energy Authority to help us figure out other components. Just a reminder, the utility relationship's really important. We're fortunate to have a willing partner in pg e who fully embraced the project goal and worked internally to build consensus. The grid innovation team is a really valuable resource because if you think about it, a utility by definition has to be highly conservative, but at the same time they're facing a great deal of pressure to figure out how to redesign 120 year old utility system. So a lot of work there for them and the grid innovation team is helping to glue that together of innovation groups as well as just moving forward at a realistic pace based on distribution system operation and so on.

Speaker 4 ([00:29:11](#)):

Also, the energy market is really transforming rapidly, so make sure you've got a partner with a strong sense of market participation, regulatory and compliance frameworks, financing and existing emerging business models. Since we've designed our project and been online for 24 months, the market has already changed enough that there are other market participation opportunities that we're trying to figure out how can we reposition ourselves to engage with KAISO and let our site participate in new

ways. So you're going to need some courage and some vision to figure out how to best position your project to remain flexible and you're going to need a willing side host and technology experts for the hardware, software and business solutions. It's a complex project, so the more help you can get the better. Next slide please.

Speaker 4 ([00:30:07](#)):

So this is just a reminder that whatever you think you're going to do, things are going to be different and we had the pleasure of trying to put in a microgrid while we're going through a pandemic working with the USDA who's never done financing for a rural project of this nature, doing the project at an airport where the Federal Aviation Administration has strict rules about how additional hardware can be placed and operated. You can think about glare off of solar panels for example, so there's additional complications. So that made for an entertaining project management experience and one of our goals was to support replication and I will point out that every project is different. There are a lot of characteristics that you're going to have to evaluate, but there are things that can be done again, so we're more of a unicorn in that we're just the first out of the gate trying to figure out how to make this work, but there are definitely components that can be duplicated, so it's a daunting task, but we did it anyway and I'm really glad we did. Next slide please.

Speaker 4 ([00:31:20](#)):

So as you're walking through this process, just right out of the gate, ask yourself when you're thinking about your business plan, is a microgrid the right solution? It serves many purposes, it's a fantastic tool, but given it's the complexity and the partners needed and the cost associated with it and as long lifespan, you really want to go in with a sober look and make sure that it's well-suited for what you're trying to accomplish and also pay attention to how the micro is going to be changed or sorry, how the market's going to be changing and will your microgrid serve that need and how long are you going to be at that particular site and are there going to be any changes in the future that could be disruptive to you? Are there other disruptors on the horizon such as new battery technology, new environmental considerations, new economic considerations in your particular area, and do you have stakeholders that are there and are going to be there for you?

Speaker 4 ([00:32:21](#)):

Then once you have that general sense of yes, a microgrid does make sense and I do have the right components in place to be successful, see where you can simplify. For example, in our case, we were able to choose a location where we were at the end of a distribution feeder that reduced technology issues and it reduced hardware costs in terms of isolation switches and it simplified the meters. So we had out of those 22 meters, 20 of them are county related, so that made the relationships for all of the tenants on site much easier, one memorandum of understanding rather than 22. So just looking for those opportunities that'll really help. Also know what's possible. You are living on the grid and that grid is your ecosystem, so you need to figure out what's feasible and that brings you to the interconnection study. So it takes time and money, but you can't avoid it.

Speaker 4 ([00:33:23](#)):

For example, we submitted our plan innocently thinking that we're going to do this project anyway, and we did it before the feasibility study was completed. When it came back, it had another \$1.2 million in it effectively saying this is what you need to update your nearby substation in order for you to do full deliverability. And we were thinking, well, that's more money than we can support on this project, but

we were able to redesign, throttle our input and output and still have a viable project. So we got lucky, but I really recommend do not go backwards. Look at that feasibility study first and foremost to inform your project. Next slide please.

Speaker 4 ([00:34:10](#)):

You've got to understand your risks, so this is just, I know that people can get very excited and say, yes, we have a hospital, a gas station, and a grocery store right next to each other. Let's make a microgrid. We can make this work, but you're going to have to think about all of the various challenges and take a good hard look at that. For example, under financing, these can be large projects with long financial payback, are you set up to service that debt for that period of time? On the technology side, we chose to solve key technology challenges such as DC to DC coupling, but in this case there were very few providers, basically one and a half at the time we started our project. So you got to think about are you willing to use untested or sole source components? I would recommend avoid it whenever possible or understand the risk for your partners.

Speaker 4 ([00:35:02](#)):

Make sure they have some familiarity with microgrids in the energy market and they're willing to engage. I think the USDA and the FAA are both happy that we dragged them through this process, but it was a long slog for them and it is not their normal business mode. So there's work involved to get 'em up to speed and to ensure that this is something they want to do. I would like to say the FAA though is really embracing microgrids at their airports because it's pretty obvious the benefits when you think about your scheduling. We're under a major grid transformation right now and that means a lot of competition for scarce components and raw materials in the foreseeable future and that adds uncertainty onto both your costs and your schedule. Climate related disaster recovery is also really depleting supply chains, so as you're trying to get transformers, so are people who just had a tornado rip through their neighborhood.

Speaker 4 ([00:36:00](#)):

So climate change disasters are accelerating. We've seen this in the last few years, so that's going to be another impact. So budget in for at least some uncertainty for delays and volatility and raw material costs, trade sanctions, there's a lot of political volatility underway right now, so pay attention to trade sanctions, other measures, domestic law regarding imports, manufacturing and shipping disruptions, labor inflation and so on. These are all critical things to just kind of wrap your mind around before you walk into this arena and then think about scale. The front of the meter microgrids include expensive control systems and stakeholder development and acceptance periods, so where you can look at maximizing your system size so that you can take those fixed costs and spread them across a larger base. It just really makes your overall project economics better. Next slide please.

Speaker 4 ([00:37:06](#)):

We talked about complexity or complications, thinking about all of the various environmental, cultural, historical requirements that you need to pay attention to. I think 80% of our population lives along a coastline in the United States, so think about coastal commissions and that sort of group. Just touching on capacity factor a bit more in detail. When you look at the name plate of your facility and somebody thinks that you're going to deliver a megawatt, you're not going to be delivering a megawatt. There are a lot of factors that reduce that efficiency and basically your project's only as robust as the grid it lives within and a lot of microgrids live within areas that have lower reliability scores. So we're going to have

in the next decade more major disruptors such as the ongoing aging infrastructure, the interim safety protocols that we need to kind of deal with that such as PSPS and EPSS events and we're going to have wide-scale grid hardening and modernization going on and all of that is going to take the grid offline periodically, which will take your project offline as well or at least shift it to island mode.

Speaker 4 ([00:38:20](#)):

So consider that in your modeling. Plus once you get it built, operations and maintenance is really critical to make sure that it just delivers on what you were hoping it to do. So wherever you're located, make sure that you have the workforce that in your community you have the technical skills that can support your o and m activities and you may need more than one project in your area before you really have economies of scale where somebody is willing to do a business venture and support the o and m activities that you need. Also, you want to reach consensus early on, finance and other goals. Resilience forces us to think beyond basic economics when comparing projects. You can't just look at net present value and say, yes, this is how I can decide which project to move forward with. Groups are working to define the quantitative value of resilience, but for now it's mostly a qualitative decision, so make sure your stakeholders share a common perspective on what is resilience and what it means to them for this specific project.

Speaker 4 ([00:39:26](#)):

Next slide please. So to give an example, TRC worked up the business modeling for this particular project and in this slide on the left side you can see are various benefits and then the vertical bar on the right side shows the various costs and there's an obvious gap there, which we call the resilience gap because what's the value of that resilience to your community, to your specific needs? We've been tested already with our site and we have supported lifesaving efforts, so it's pretty clear. For example, if you're doing a microgrid for a hospital or for critical facilities that you can save lives, these are all very good things. It's tricky to put a value on one life, but sometimes that's what you're going to have to do as you're evaluating these projects. For us it was clear the resilience values we didn't have to get into in depth valuation conversations and we were willing to make this stretch, but it's not a pure economic play. It's not something that you're just making cold hard cash on. You need to consider the value of resilience to you and your community. Alright, I belabored that point, but let's move on one more slide.

Speaker 4 ([00:40:52](#)):

So in our particular case, was it worth it? Absolutely. In December, 2022, on the second shortest day of the year we had a 6.4 earthquake, which is a significant earthquake. It's not as dramatic as it could be, but it did have, I think it's listed in the top five most intense shock wave type of earthquakes. So it was pretty impactful for our area and it took power down for the whole region. Region. In our particular case, we had also just participated in the market, so our batteries were really low and we were having a storm of course. So through all of that the microgrid did just fine. I'm really glad to report it did exactly as it was supposed to because we did have low batteries, we were able to cover 15 out of the 16 required hours, but we were really pleased with that results. If we, we've now enacted what we call storm mode, so as we monitor weather conditions, we increase our state of charge reserve so we can better ride out these conditions. Earthquakes are unpredictable so we're not able to do that. Just luck of the draw there. But overall in the following, we had 12 atmospheric river events that followed after the earthquake and we continued to deliver. So I would say in a lot of ways our microgrid has already delivered on its promise and we just need to keep it running. Next slide please.

Speaker 4 ([00:42:30](#)):

So other people felt that it was also valuable. I think here's a couple headlines. The one on the top here basically says no other option is acceptable. That's related to the Coast Guard and our Coast Guard serves a very long border, so it's pretty essential, but other people can pretty quickly see that microgrids have a definite place, resilience has value, and if you think back to Superstorm Sandy or Katrina or many other large disasters, you can think about the cost of recovery is pretty high. If you're able to plan ahead and have services in place that can operate and have full deliverability during a disaster, human suffering goes down pretty significantly. We all have a very personal awareness of this most recently as we had a pretty intense storm previously this year with many people out of power. So yeah, there are benefits. Let's move on to next slide please. So I'm hoping that you will get the idea that I am enthusiastic about microgrids. Here's the before and after picture of what we drew on paper and what it looks like from the satellite and it's not too far off and it's doing the job as intended, even as being a proof of concept first of its kind, it worked out. So I want to encourage all of you, what will you build and that's the end of my presentation.

Speaker 3 ([00:44:12](#)):

Okay, thank you Dana. I'm happy to see that you have not scared all of the participants away, so no, thank you for that honest take. I mean, as I alluded to before, it is a complex undertaking. I'm going to pause and ask folks if you want to ask a question of Dana, please raise your hand and while we're waiting to see if we get any hands, okay, we have Tony. Tony, go ahead. Everyone should have access to their own mute button, so go ahead and unmute yourself and jump right in.

Speaker 6 ([00:44:53](#)):

Oh, thanks very much. Thanks again, pg e and Jeremy and everybody for putting this together. Dana, as always, great presentation. The question I have for you is have you done any look back to understand the economic benefits of being able to operate during an outage? Any quantification there?

Speaker 4 ([00:45:18](#)):

Yeah, I would love to. Right now we're still commissioning the facility. As I mentioned. We had some technology innovations we were doing and we're actually having to replace out one vendor with another, so that's disrupted our ability to get a fully commissioned facility and so we've elected not to do the analysis on the various benefits, but that's a really good point. We're just working on o and m right now and funding that, but I think I should dig around and see if I can find some grant funding to help quantify the benefits to help drive that conversation forward.

Speaker 6 ([00:46:00](#)):

Awesome, thank you Dana.

Speaker 4 ([00:46:02](#)):

You bet.

Speaker 3 ([00:46:12](#)):

Hey Craig.

Speaker 7 ([00:46:16](#)):

Thanks Jeremy. Hi Dana, and you're your benefits versus cost slide. You had a bar on benefits for additional RA revenue, I think it was. I was wondering if you could expand on what that was. The source of that is that RA payment or

Speaker 4 ([00:46:39](#)):

In our case it's just bucket one RA associated with renewable generation at our facility and RA is very scarce in California right now,

Speaker 7 ([00:46:54](#)):

And so you have deliverability then with your interconnection for the RA from the solar.

Speaker 4 ([00:47:03](#)):

In this case the business model was looking at what is possible but not necessarily what we have applied to do. So yeah, let me back up a bit. You're asking a really important question. We only went for wholesale delivery in our initial application with Kaiso. Now we really wish that we had applied for RA deliverability because RA has gone through the roof and we would love to have access to that now in five years because RA is through the roof, there might be a gold rush and everybody then suddenly generates massive amounts of RA and suddenly there's not so much interest in it. Then ancillary services like regulation up and down might become much more stimulating and in fact we're kind of in a situation where regulation up and down is lucrative for us, so we are able to participate with that, but in probably two years, the gold rush that's currently underway for that is going to cause that to be much less interesting. So I think we've got some opportunities to work with Kaiso to improve flexibility. I know the interconnection studies and determining your application when you put it in, wait nine months, see if they'll accept it, what can we do to accelerate that timeline and increase flexibility so that Kaiso is a little more dynamic in its response to new services. That's not possible right now or not easy right now.

Speaker 7 ([00:48:34](#)):

Yep. Great, thanks. Yeah, I'm with energy Vault and we're doing the Calistoga microgrid and we're in the process of, we have our WDT and our connection process underway right now, so thanks for the collaboration and we're right there with you guys and going through that.

Speaker 4 ([00:48:52](#)):

Yeah, yeah, hang in there and do scrutinize that early and often there are trade-offs with how you decide to participate in the market.

Speaker 7 ([00:49:02](#)):

Yep, definitely. Thank you. Yeah, Timothy,

Speaker 8 ([00:49:11](#)):

I was wondering if you have any observations rather than quantified data on other intangible benefits in the community. Have there been more people visiting or more inquiries about development or investment around the airport or on the microgrid? Any other kinds of things such as that?

Speaker 4 ([00:49:32](#)):

Absolutely.

Speaker 4 ([00:49:36](#)):

Business is business, but we're all human at the same time and it was really inspiring to have a group from Japan come over and tour the facility as they decide they're on an island. They have a lot of constraints they've had since Fukushima. They've had real constraints on their system regarding nuclear and they're really having to take some cold hard looks at how they redefined their energy system. So having them arrive here and walk through the facility and gain a personal in hand understanding of what's possible with different renewable energy systems is really meaningful. Also, having people from Portugal come over and then having conversations around offshore wind. We have a pretty large offshore wind opportunity here, so it just really helps to drive the conversation on energy resources and so I find that very meaningful. There's the political capital that you gain in helping to push this concept forward.

Speaker 9 ([00:50:40](#)):

Thank you.

Speaker 3 ([00:50:46](#)):

Okay. I'm not seeing any more questions. I will just note one thing while maybe folks are thinking of any final questions. Dana, you spoke the truth and it's important to speak the truth about what one is getting into in these projects. I want to make sure that those that are here from local governments or CBOs, et cetera, to understand that you don't have to take on all of these things that Dana described. Your partners, the folks who will be presenting later on can take on much if not all of these aspects on your behalf and that's why we're trying to make these connections. Dana actually happens to be in the business. They're a community choice aggregator, they're in the energy business. They do this every day. If you're a local public safety officer, a mayor, a supervisor, whatever it may be, you're not in this business and you don't need to learn at all to do it.

Speaker 3 ([00:51:48](#)):

You just need to find the right partners to make it work and take that on your behalf, including Dana mentioned a lot of risks in there. There are structures that you can explore with your partners where the third party who is in this industry and has multiple projects to spread all their risks across can take that on your behalf and give you a more firm offering. And so some of that, I don't know that parties will really have an opportunity to go into that in detail today, but they can give you a high level of the types of services that they provide and you can explore it in more detail with them after the fact. We did get one more hand raised, not seeing the name, sorry, but whomever it is, please jump right in.

Speaker 9 ([00:52:34](#)):

Mark, I'm curious as to why you chose to go in front of the meter microgrid as opposed to behind the meter for supporting a specific facility like the airport.

Speaker 4 ([00:52:48](#)):

Well, we're gluttons for punishment. We could have done a behind the meter somewhere else, but we really needed to solve this problem for distributed energy to happen. We've got to figure out how to solve more models within the larger grid and the utilities needed to understand this. The California Energy Commission wanted to understand this, so we elected to find a location where we could de-risk it a little bit, but still prove how can we have a third party operating on a utility distribution system, and it pushed us into evaluating those roles and responsibilities among the various partners. So you can

certainly have a much simpler approach, but there are many cases where if you're a municipality for example, you might have five facilities that are somewhat co-located but not completely co-located and you can't do an over the fence energy transfer. You need to figure out how to tie it together using the distribution system. There are many, many, many cases like that, so we felt the need to help solve that problem.

Speaker 9 ([00:53:57](#)):

Great, thank you.

Speaker 4 ([00:54:00](#)):

I do want to put in a public service announcement for Jeremy's team. We are very fortunate in California and specifically in pg e service territory to have the grid innovation team available to us because they're a willing partner who really stepped up and helped make this possible for us and that they have shown the willingness to put together the microgrid incentive program and to assemble a bunch of different vendors with many different expertise and bring 'em to you is a huge asset. So do take advantage of that.

Speaker 1 ([00:54:32](#)):

Thank you, Dana. I would just like to flag one more question for you in the chat from Jason Heindel. Are you saying fast response frequency control is not possible with your BESS now for ancillary services?

Speaker 4 ([00:54:47](#)):

It is absolutely available and it just depends on working with the local distribution operator on their willingness to take that power onto the grid, so that's more conversations to be had. And then there's also questions on the Kaiso side as far as if we wanted to reserve state of charge. I believe you have to think about whether or not Kaiso wants full deliverability on your nameplate data or whether they're willing to allow you to hold back for your islanding conditions. So there are nuances.

Speaker 3 ([00:55:32](#)):

Okay, Dana, thank you. Thank you for taking the time to put this together and taking the time to meet with folks or to present to folks. Appreciate the continued partnership and looking forward to working on the next project with you. Okay, thank you. Next slide please, and actually Jesse, I can I have a quick time check where we're at on the agenda.

Speaker 1 ([00:56:03](#)):

We are right on time. We have about four minutes until our first 10 minute break. So there's some slides that we just scooted through that are the appendix to Dana's presentation and they will all be made available to everybody following this webinar.

Speaker 3 ([00:56:17](#)):

Perfect, thank you. Four minutes is about all that I need. I just want to touch on that. The slides will be distributed via email to parties after this presentation, just I think it was said before, but I'll say again, it is being recorded and will be posted to pg and e's website following after we have time to remediate it and do a couple of other things. It'll be put up onto our website and available to parties for the duration of the MI program so that tranche two, tranche three, you can come back and take a look and see the

plea patients from parties, so public funding opportunity for microgrid development. I'm just going to touch on two specific ones real quick, but then also note that there's a lot of money floating around these days to help support resilience broadly and microgrids specifically in some instances. So this whole program in and of itself is an opportunity to get funding for microgrids.

Speaker 3 ([00:57:25](#)):

In fact, I'm going to take a quick moment to loop back to the cost benefit slide of Dana's presentation. If you recall, he discussed that there was a gap, I forget how much, \$2 million or so in a difference between how much the project actually costs and their calculated benefits. There's a couple ways to think about that gap. One is to say, well, that gap, if your value of resilience, how much you really want, that resilience product is worth that gap. Then the project makes sense and that's the way he framed it. The Microgrid Incentive program is actually intended to help fill some of that gap and so parties can come and your A IR is essentially asking for funding to help make up that difference to get your project into the black to where you're not incurring those millions of dollars the local communities. So don't want folks to come away from this meeting thinking that, oh my goodness, this project's actually going to cost us millions of dollars.

Speaker 3 ([00:58:33](#)):

We thought we did not realize that's the case. No, the micro given incentive program funding is intended to help fill that gap. There are a couple funding opportunities I want to call out specifically. So working with these folks, and particularly in the early stages of developing a concept idea in an application does cost money. In some cases, maybe the third party would say, or sorry, the vendor would be able to say, okay, we'll just do this for free. We recognize that they're in business and so some repayment is appropriate, so we've offered up to \$25,000 in reimbursement for a complete application, so costs that are incurred by the community or the vendor that's submitting the application. Hey,

Speaker 5 ([00:59:25](#)):

You go into the office around 1130

Speaker 3 ([00:59:30](#)):

Folks, please make sure that you're on mute. That is reimbursable after the fact, so you submit an eligible application and then apply for the 20 5K and we will up to 20 5K. We will well reimburse you based upon your costs. The CPUC also has a program, the Clean Energy Access Grant, where they will provide up to 500,000 in funding for project activities and application support aimed at increasing access to clean energy programs such as Myth. In fact, this Clean Energy Access grant was developed to support three programs in particular and MIP is one of those programs. So it's really targeted right at this program. The first cycle application runs tomorrow through April 30th, so you're right in the sweet spot for applying for these funds and there will be a future second cycle for the dates for which have not yet been set. When we send the slides out that you can access via that link or if you want to take a look right now, just search CPUC, clean Energy Access Grant and I imagine you can find your way there.

Speaker 3 ([01:00:42](#)):

Just so you know, when you get to the page, the initial landing page, what you'll probably see is a whole host of programs that the CPUC offers focused on equity and access. Just scroll down until you find the Clean Energy Access grant link and click on that. There are other funding sources out there. We don't have a clean perfect list for you, but I do suggest as you start to wade into this, if you feel like you need

to find additional funding, keep your ears out, do some searches, talk to potentially the vendor community, they should be well plugged in as well and keep an eye out federal sources sources at the state as well. Okay. That's what I have for this section. We are now going to go into a 10 minute break so that folks can get some coffee revitalize and when we come back we will have the first group of vendors, the origination group start presenting the part of our presentation. If there are any questions that folks have, I can stick around during the break time, but otherwise we will reconvene at 10 40.

Speaker 1 ([01:08:54](#)):

Folks just flying that we have about one minute left in our break time. Alright everyone, welcome back. It is 10 40 and we will start our technical partner Spotlight series. Our first group is origination and we will kick it off with energy security. Well, our presenter from Energy Security, please join us.

Speaker 9 ([01:10:18](#)):

Sorry about that. I was on mute, wasn't expecting to be first. Well, like Jeremy was saying at the beginning, it's hard to find a bucket to be in, but energy security is a full service microgrid provider. We're a group of engineers with all disciplines that are involved in putting together a microgrid, and we also manufacture a system we call a microgrid in the box. So once all the DERs and infrastructure to support those DERs and transport, the energy is completed. Our box can take any form of energy, whether it be electrical or thermal, control it and distribute it. So we do mainly what we call in the reserver business.

Speaker 9 ([01:11:19](#)):

We go up to about two megawatts from there. We're probably not the right company, but to support fire station, police station, supermarket, whatever, we're capable of handling anything like that. Also, the system can be the main service entrance, the main service panel, and we distribute the energy in what we call buckets, which would be your, we call them energy sucking pigs that may drop off when the pg e's grid goes down and then priority grid supported with the DERs and batteries. And then beyond that, the critical control grid, which is supported by its own set of inverters and batteries so that whatever critical items you have in your micro grid are supported for as long as possible.

Speaker 1 ([01:12:21](#)):

Wonderful.

Speaker 9 ([01:12:22](#)):

Oh, sorry. That's just in a nutshell.

Speaker 1 ([01:12:27](#)):

Wonderful. Does anybody have any quick questions? We are good on time. Okay, great. We will scoot on forward to our next partner. And just as a reminder, this webinar does not constitute an endorsement recommendation or approval of third party product services or any other offerings. Pg e is not liable for the content or offerings presented by participating technical partners, so thank you so much. If we could have Global Energy Credit stefana.

Speaker 10 ([01:13:01](#)):

Hello, this is I'm the CEO of Global Energy Credit. Global Energy Credit is a woman-owned small business. We are headquartered in the Bay Area and we have a huge presence in the Los Angeles area. Our team specialize in providing energy services to clients, which include energy efficiency and electrification planning, as well as the development and design of distributed energy resources and microgrid systems. We do all of that and we collaborate closely with our clients to identify vulnerabilities to catastrophic events while we are aligning with their environmental and economic objectives of those clients. Additionally, I can say our team assist the clients in securing both public and private investment to facilitate project implementation. Some of our projects are like Illinois Institute of Technology, microgrid Community Microgrid in New York and Massachusetts area, south Coast Air Quality District and Vent Rock County Energy Efficient campuses. These are the projects that we have done and thank you for having us here.

Speaker 1 ([01:14:31](#)):

Thank you so very much. Do we have any questions for Global Energy Credit? Wonderful. We will scoot right along. If I mispronounce your company's name, I sincerely apologize, but it looks like we have Guam Solar Next.

Speaker 11 ([01:14:52](#)):

Hello, this is Mariana from Guam Solar. You have pronounced it pretty much correctly. So we're Dutch, originally international company. We're a solar developer and in the past few years we have developed more than a hundred megawatts in New York state and we're now expanding to a 500 megawatt portfolio of community solar in New York and California. What we do is we offer full flex offering from origination of microgrid projects including feasibility study, which is the initial assessment of the micro grid variability and requirements design and engineering for detailed plans and specifications for the micro grid implementation, we offer customized solutions for the client depending on the load consumption data and optimizing the energy usage savings, utilizing the demand response and the battery optimization. We offer financial analysis for the microgrid projects and how that will impact the carbon emission reduction and the credits generated by that. And we assist in the full permitting process with our local people on the ground, engaging with key stakeholders, getting municipal approvals and securing commercial installation permits, which is a cumbersome process. So this is a summary of who we are. Thank you very much for giving us opportunity to present ourselves and we look forward to collaborate with some of the attendees.

Speaker 1 ([01:17:00](#)):

Thank you so much, Mariana. Do we have any quick questions? Okay, wonderful. Let's move on ahead. We have Hitachi Energy, the grid edge solutions.

Speaker 12 ([01:17:15](#)):

Hello. Good morning everyone. Hitachi Energy. So Hitachi Energy has a long history, over a hundred years of history. We specialize in transmission, a full range of transmission solutions. I'm from the Grid Edge solutions team, so in this group we have a full range of battery energy storage systems we call EMS portfolio. We can have fully integrated solution that can be used for renewable energy and integrations and microgrid applications. Next slide please. So I say from this slide on the left we have our smaller integrated battery energy storage systems. This system can be up to 500 kilowatt in power and 670 kilowatt hours. The benefit of this system is that all the components like the controller batteries is and auxiliaries and the converter are integrated into one box with the transformer as added on because we

have to meet different voltage levels at different sides. And on the right side you can see we have the modular portfolio, so we can upscale to anywhere in the 100 or 200 megawatt range with one megawatt blocks. So both solutions can be used in microgrid applications depending on the size of the products. Next slide please. So the benefit of a system is that we are fully vertically and horizontally integrated.

Speaker 12 ([01:19:24](#)):

All the components associated with the microgrid systems are provided by Hitachi energy. So all the interfaces between all elements from the battery, the controls EMS and the remote access and applications are fully integrated by our team, our in-house team. So you don't have to take care all these combinations of integrations. So horizontally we not only have the battery energy storage system, but we also have the controls to control other assets, the network because we for macro grid applications, applications, we had to monitor the network and we also monitor and control the load feeders and then in the meantime we have controllers to control the conventional generators like diesel chain sets or solar farm and EV charging stations. Next slide please.

Speaker 12 ([01:20:29](#)):

So this is one of our examples. Over the years we have implemented over 300 microgrid applications worldwide and many in the US So this is one of the good examples in the us. So this is the Arlington microgrid product in Western state. So the customer is county POD. So with this product we have our full EMS portfolio installed with a battery energy storage system with the integrated solution and we have interface and controller to control the solar and control the side. And then we have also a EV charging station with the V two G applications onsite. So the purpose of this product is to provide reliability and the resiliency for the customer and in meantime to integrate the solar and V two G. And the other aspect of this product is that this is one of very few early V two G integrations in the country. So this system has been running since three years ago. So if you have time, we are welcome you guys to come and visit. So to show you the performance and operations of this system. Yeah, thank you.

Speaker 1 ([01:22:16](#)):

Thank you so much. Do we have any quick questions for Hitachi?

Speaker 12 ([01:22:22](#)):

Yes, I have a quick question. In Japan, have you been doing pump storage with the deep mines in Japan that provide water and also electricity from pumping the water out of those mines? Yeah. Okay. You're talking about pump storage, right? Yes. Yeah, so that pump storage was on another division of Hitachi, so I'm from the Hitachi Energy Group. This group, we are mainly focused on the transmission micrograde applications. So for the pump storage I refer you to the company in Japan. So yes, we're looking at removing the water from the deep mines in Japan and bringing to the surface and then dropping the water back down with a generation of electricity that matters. Yeah, I know exactly what I'm talking about. I have more than 10 years of experiences of pump storage constructions in the past. So if you have my information, you can contact me, I can find the right person for you for this application. Thank you very much. Yeah, thank you.

Speaker 1 ([01:23:54](#)):

Perfect. And along with these slides that we'll share out is all the contact information for everybody presenting here, so we'll move on forward looks like next up we have Invus power.

Speaker 13 ([01:24:08](#)):

Great. Good morning still our next slide. I'm Mark Hoffman, CEO of Invus power. The best way to think about in Ovu power is that if you look at that picture in the lower right, we really are a power management and control system company and designer of microgrids. And so our expertise is in the design of pulling the right pieces of energy sources including when the stored energy has value into an application. So the lowest emissions and cost of power is dispatched while improving reliability. We system, we design and provide systems as a platform offering, but we also do design modeling. One of the things that's very important in terms of Jeremy's comments about where do we fit in that landscape, we partner with people who really are developers, they're often our customers. We also partner with people who are EPCs and financial sources. So we come into customers who could be communities, developers, utilities themselves and basically provide them here's the design that best fits what your needs are.

Speaker 13 ([01:25:29](#)):

And I'll talk about that in a few minutes. One thing as a table setter is I think it's exciting as Jeremy pointed out, it's probably one of the most exciting times when it comes to the value of microgrids. If we think about the history of power for a hundred and something years, cost was always really if you wanted lower cost power, it was always had to be utility scale, bigger was better. Microgrids were really off grid power that were just a necessary evil where you couldn't have a utility line reach them. They were typically dependent on say diesel and costs and emissions were very high. Well today with all these different energy sources coming to play, we have to have a way of integrating and effectively managing their dispatch. And what's really exciting about that is now for the first time, whether you're grid connected or you're islanded, you can actually have a cost of power that could be at or significantly below what you today pay for your utility scale power.

Speaker 13 ([01:26:32](#)):

And frankly, even though that sounds negative for the utility, it's actually a one plus one equals three because the utilities are stressed and it helps them when we can now put power in different points along their grids where then people now have an alternative and not just have lower cost power but know what their cost of power is going to be for say 20 years. Just one other housekeeping point is for non power geeks in the room on the call, when we talk about a megawatt of power, it's roughly 750 to a thousand homes if it's industrial or commercial, generally commercial power is anywhere from 150 to a couple hundred kilowatts. It could even be 600 industrials can be in the thousands. So it's very important to understand that and the way to see a novus is we're the guys that will pull the people together to get the right solution for your microgrid. Next slide.

Speaker 13 ([01:27:35](#)):

One of the areas that we believe is extremely probably the core of everything that anybody wants to do is really understanding what their microgrid design should look like. Now when I talk about design, I'm not talking about the installation design, what you'll hear from EPC, some of them on this call, we partner with understanding the cost of an installation as a whole and permitting as a whole area of expertise. Financing is a whole different realm. We'll pull those people together or those teams together. But what really is the heart of everything is what is it that you need? So we understand it's critical we understand what your demand profiles look like, offer a range of configurations that can get you to whatever your objectives are and then get you a thorough financial analysis so you understand what your trade-offs are. So when it's all said and done that way you, if you're looking at say a megawatt

application, it's critical for you to know, hey, what's my cost of power? But also what's the capital cost upfront to get there if I'm say deploying a stored energy and battery system and how do I balance the energy cost reduction versus the capital or the cost of money that I'm going to apply. So with that, I think I'm bumping right up to my five minutes and be open to any questions.

Speaker 1 ([01:29:04](#)):

Thank you Mark. Looks like no questions we can scoot on forward. I believe next up is lose energy consulting. Alright.

Speaker 6 ([01:29:19](#)):

Hi. Good morning everybody. Thanks again to pg e and everyone else for joining and attending today. My name is Tony Pastor and it's a pleasure to be with you all. I'm excited to participate in this meeting. It's kind of one of a kind to have all of these folks in the room together talking about one of the most important really energy advancements in the world, which is microgrids. Super exciting stuff. So a big thank you to pg e staff for continuing on the path to enable community microgrids. I appreciate your continued commitment and efforts to partner with communities and the industry to facilitate these important energy facilities. It's amazing to have so many longtime colleagues and champions of the humble and yet mighty microgrid all in one room. As our time is short, I've prepared a brief summary statement to give you a sense of what I offer.

Speaker 6 ([01:30:17](#)):

As some of you know, I've been in the renewables and DER industry since about 2010. Prior to 2010, I owned and operated a civil engineering firm and was responsible primarily for project planning design, multi-agency partnerships, vendor management in all manner of permitting, including federal, state, and local. Today, my work spans across the energy industry including projects, policy programs and products. As noted many times today, there is no end to the complexity and challenges when developing microgrids. It takes teamwork to make the dream work and given the complexity of modern microgrid, modern microgrids partnerships are truly the foundation for success. As Dana noted earlier, a microgrid, you have to ask yourself the question, is a microgrid really the right solution? And if it is, it's important to explore and consider all of your options. Over the past few years, I've worked largely in the CCA space that's community choice aggregation in California to help develop both front of the meter and behind the meter microgrids as well as numerous other programs benefiting local governments and CBOs.

Speaker 6 ([01:31:32](#)):

Today I leverage my many years of experience to bring creative solutions in support of microgrid project development across several areas. And as Jeremy noted earlier, as the customer or local government official CBO or end user of the microgrid, you do not need to become a master of all things microgrid. That is exactly why we are all here, is to provide turnkey solutions for your local microgrid. So what do I do? I do several things. I work as the owner's rep for project end user and site hosts. I help with all phases from concept through completion, including R-F-P-R-F-Q, vendor and product selection, project design and development and funding applications. I interpret the complex technical jargon to help you understand and make decisions. I work with developers to support land use, interconnection, permitting, mitigation, grants, incentives, and all of the many other bureaucratic and technical needs including distribution and substation upgrades.

Speaker 6 ([01:32:36](#)):

In policy, I advocate and negotiate for fair and equitable rules that embrace the latest technology to facilitate DER integration like microgrids at scale in programs I've designed, administered and implemented a number of programs across decarbonization sector, including microgrids, Dr. A DR, incentives, rebates, technical assistance, community grants, and more in products I've co-developed innovations in PV balance of system hardware, biogas reactors, producing renewable natural gas, the ui, UX, and HMI apps and more. Again, in all of these endeavors, it takes a team. Pge is a critical member of that team and I engage with pge staff as key members of the project success team.

Speaker 14 ([01:33:25](#)):

What's that? No, two 30 bottom of the hour.

Speaker 6 ([01:33:30](#)):

Somebody who just said two 30, your mic is on.

Speaker 1 ([01:33:33](#)):

Please turn your mics off. Thank you.

Speaker 6 ([01:33:36](#)):

Thanks so much. I've worked with pge protection engineers, interconnection managers, the remote grid microgrid team, and even the customer billing department working together. We've resolved numerous challenges over the years. This iteration of microgrid enablement and incentives in pge territory promises to move the needle in the right direction toward a reliable bankable microgrid development process. I'm particularly grateful to pge's many committed employees for being diligent, smart, and engaging in navigating and developing these programs inside of one of the nation's largest utilities. Please feel free to reach out to me anytime to discuss your projects. I'm always interested to learn more about your particular needs and share my expertise. I'm happy to chat at your convenience and look forward to meeting with you. Thanks so much. Oh, next slide please. There you go. This is some of my partners folks I've worked with over the years.

Speaker 1 ([01:34:34](#)):

Thank you so much. Are there any quick questions for Tony? All right, next up we have our energy.

Speaker 14 ([01:34:46](#)):

Thank you Chelsea. Good morning everyone. We're excited to be here and it's a deep honor to be presenting to you. So next slide please. You could, Jesse. Thank you Jesse. Good morning everyone. We're excited to be here and it's a deep honor to be presenting to you. Our energy is a full service and best in class consulting, design and development company. We're based in California in pge territory and we have extensive experience working with the California investor owned utilities. We have renewable energy projects also across the us, Latin America, Caribbean, Pacific Islands and Africa. We're presenting today in the origination category, but we additionally provide end-to-end origination engineering and financial consulting services. We have deep experience in the technologies, interconnects and permitting and grant applications, all of the aspects of optimizing a microgrid operation as well as a grant application. The link, if you do get our slides or go to our website, our energy co.com, then you'll find links to 40 plus past and present project examples.

Speaker 14 ([01:36:17](#)):

Meeting the unique needs of municipal and tribal governments is one of our specialties. We know what it's like, for example, to go in front of a city or tribal government and present for their decision making, all the aspects that need to be considered for microgrids. So we're presently underway, for example, in the MIP program with the city of Oroville, California, and there we got a unanimous yes vote from their city council to select our energy to assist their study and application process. This was also recently covered in a television news story and if you find our energy on LinkedIn, you'll see a post for that link. We have another municipality currently in the MI program and we have others, both municipalities and tribes that are queued up for the next MIP tranche in months to come, we offer a free consultation to anyone interested in learning more about our approach to success and I'll just mention that we are, in addition to working with municipalities, we have some experience with tribes including the Rincon Band of Luciano Indians and the San Pascual Band of Mission Indians.

Speaker 14 ([01:37:46](#)):

In addition to that, we also work on some very big projects. So California Forever is a project that you may have heard of that we are the renewable energy team. Behind that project, Baylands is a project, it's a planned urban development on the border of San Francisco that includes housing for 10,000 residents, seven distinct neighborhoods, retail districts, corporate campuses and hotels, all powered by renewable energy. And another example that we can pull from is the California DMV and CHP campus in Sacramento. It's a single campus with three buildings and nine parking lots doing the renewable energy for them. So again, we're a full service concept to completion organization. One thing that makes us stand up is we are independent from any technology or vendor, thus we can do a full study and optimize a solution for the organization that we're working with. We are experts across all of the forms of renewable technologies and we have engaged in microgrid implementation, transmission distribution, interconnect, smart grid infrastructure, advanced management control interfaces. Please reach out to us. We're based in Santa Cruz, California. You have a phone number there on the slide and the email address info@renergyco.com. I'll take any questions. Thank you for having us.

Speaker 12 ([01:39:36](#)):

Have you done any pump storage projects up in the Sierra?

Speaker 14 ([01:39:42](#)):

We have not done pump storage in the Sierra, but we are involved in a pump storage project that is in central California. Be happy to talk more about that.

Speaker 12 ([01:39:54](#)):

Is the project in central California dealing with mine waters being pumped out of mines?

Speaker 14 ([01:40:02](#)):

It's not dealing with mines. It's basically it's a dam with pump storage.

Speaker 12 ([01:40:09](#)):

Okay, thank you.

Speaker 1 ([01:40:13](#)):

Great, thank you so much. Next up we have looks like power secure.

Speaker 7 ([01:40:21](#)):

Thanks, Jesse, this is Todd Jackson with Power Secure. Feel good. So we're located in Durham, North Carolina and are operating nationally across the United States. If you go to the next slide please. So on the left hand side a visual of our company. So we design, build, operate, and maintain, and we do have an ownership structure for when we're not dealing with someone who would like to own the microgrid themselves. So all of those are badged by power secure. So we are doing economic value stacking, so there's some comments about the greater energy market value for the capacity that's put in place for the microgrids. So we do spend a good bit of time identifying all of the incremental values that can be derived from just providing reliability and resiliency to the microgrid. We actually manufacture the majority of the components that are in our solutions. We have our own construction crews commissioning, we have a monitoring control and dispatch network operations center.

Speaker 7 ([01:41:33](#)):

We're operating solutions for seven of the largest utilities across the United States and a big majority of the cooperative utilities, different forms of community microgrids from actual housing communities to critical infrastructure being healthcare or critical infrastructure being city campuses. That would include nine one one call centers, police station fire, those types of applications. On the right hand side, a few statistics right now we're maintaining about 4.7 gigawatts of energy assets across the country. The successful load management events that is dispatching the microgrid for economic benefit, whether it's program in any of the organized markets. The other is O RTOs. Besides CO, we predict manage coincident peak events for different utility customers across the country. To date the, this graphic is slightly dated. It's about 2.6 gigawatts of installed capacity in different forms of microgrids, the successful standby vents, so that's under grid outage. We're managing on and off island and on and off for maintaining continuity of operations for our customers that we put the microgrids in for. There's somewhere around 24 to 2,400, excuse me, 2,400 to 2,500 distinct microgrid sites around the country. So that's power secure in a nutshell.

Speaker 1 ([01:43:27](#)):

Thank you so very much. Do we have any quick questions? All right, we'll scoot on forward. Next up we have Sovereign Resiliency Partners. Oops. Hello? Hello?

Speaker 15 ([01:43:52](#)):

Hi, am I on? This is Ed Salzberg.

Speaker 1 ([01:43:56](#)):

Yes you are. You can go ahead.

Speaker 15 ([01:43:58](#)):

Great. So thank you for having us. I'm a partner in Sovereign Resiliency Partners. We're actually headquartered on the East coast, but most of our work is in California with Native American tribes and we focus on tribal resiliency and we interpret that rather broadly. We look at the resilience of the reservation, which very often, most of the time that has an energy center to it, but resilience also means being able to address other issues that are maybe intersect energy, but they're not necessarily all about energy. So we look at public health, emergency water and wastewater operations and take a, we call it

the 360 tribal reservation or the smart reservation look and then come back in and much of what we recommend and work on with tribes has to do with energy measures. Starting with energy efficiency measures and working right up towards distributed energy across the reservation.

Speaker 15 ([01:45:00](#)):

We're working with several tribes now in California and have starting to work with several others and we do project, we do feasibility studies to make sure we're on the right track and we have all of the right programs in mind. We line that up with government grants, try to get as much grants as we can for the tribes and then move into the design and implementation stage and work on the development of the projects and then finally into implementation. So we're full service to the point that we can bring it down to the initial design and then we work with partners to do the more detailed design and the construction managers, we actually work with Global Energy Credit that came on earlier, trusted partner of ours.

Speaker 15 ([01:45:56](#)):

So I guess in a nutshell, we are just a good resource for the tribe to go from the beginning. What's our problem? How do we develop resilient solutions so the lights stay on when the grid goes out, that reducing energy costs, energy utilization, moving to cleaner equipment for public health and other reasons and then move into the most cost effective cost and efficient solutions starting with energy efficiency. Moving right up to microgrids. We also won a community solar grant from the Department of Energy to become a solar developer. It's their solar accelerator program and we were one of a handful of companies that won that prize this year, which is funding for us to get smarter in a lot of areas that make us just a really better partner for the tribes to just fill in some gaps in our experience. So in a nutshell, that's who

Speaker 1 ([01:47:06](#)):

Thank you so much Edward. Do we have any quick questions for Sovereign Resiliency Partners? Ted? Ted you can go ahead.

Speaker 5 ([01:47:28](#)):

Can you guys hear me now?

Speaker 1 ([01:47:30](#)):

Yes.

Speaker 5 ([01:47:31](#)):

Okay, so I was wondering Edward, have you guys worked on with any of the tribes here in California on the north coast? Hello

Speaker 1 ([01:47:47](#)):

Edward, if you're still on this question is for you.

Speaker 15 ([01:47:54](#)):

Oops, I think I got kicked out but I was at the end of my session anyway.

Speaker 5 ([01:48:00](#)):

Have you worked with area of the tribes here on the north coast of California?

Speaker 15 ([01:48:03](#)):

I'm sorry, that just broke up for me. I'm sorry.

Speaker 5 ([01:48:06](#)):

Have you worked with the tribes here in California on the north coast?

Speaker 15 ([01:48:12](#)):

On the North Coast? We've worked up as far as Sacramento and then down the lower part of the Central Valley so far.

Speaker 5 ([01:48:27](#)):

Okay, thank you. That's what I was curious about.

Speaker 15 ([01:48:33](#)):

Great, thank you.

Speaker 1 ([01:48:36](#)):

Alright, thank you so much. Looks like we can move ahead. We have CCO Energy Solutions up next. Are we joined by CCO Energy Solutions?

Speaker 2 ([01:49:01](#)):

Hi Jesse, it's pronounced Cerco Energy Solutions. Is anyone on the call for C Orco?

Speaker 1 ([01:49:07](#)):

Apologies for that.

Speaker 2 ([01:49:09](#)):

No worries. Gabe Johnson, are you with us?

Speaker 1 ([01:49:31](#)):

Alright, well if not, do we have another, we can flash that on the screen. Perfect. Folks can read that. This brings us to the end of our first group of origination technical partners. I think we can pause here if there are any general questions that anybody would like to ask before we move on to engineering. Looks like Gabe is joining us now. Hello Gabe, if you're with us, we are able to have you present right now.

Speaker 16 ([01:50:14](#)):

Okay, I am with you. I just joined. If you could give me one second here.

Speaker 16 ([01:50:36](#)):

Okay, thank you for the time everyone. My name's Gabe Johnson. I'm with Seco Energy Solutions. Cico Energy Solutions works with organizations to identify resilience and needs and implement self-generation and storage. We focus on optimizing energy consumption, reducing annual utility costs and improving building infrastructure. We develop, design and deliver solutions that improve safety and comfort while reducing your carbon footprint and saving precious funds. We've proudly completed over \$200 million in projects throughout California providing large scale energy efficiency projects ranging from 250,000 to about two over 20 million. Our areas of expertise are, our projects are customized to fit each customer's need, including project financing assistance, grant application assistance and energy projects consisting of solar PV design and construction energy storage technologies optimized for energy arbitrage and demand management and microgrid integration of generation and storage technologies for resilience and economic purposes. Since founded in 2013, we've provided energy based solutions to various building styles including multi-campus projects, individual buildings and highly complex facilities. So we're basically a turnkey energy services provider that has a fair amount of experience in designing, developing and implementing solar and storage projects including microgrid projects. So with that, that's basically an overview of our company and I'm happy to take any questions if that's where we go next.

Speaker 1 ([01:52:26](#)):

Alright, thank you so much Gabe. Sounds like we can move forward. Our next group is engineering and we're going to split this into two parts with a break for lunch in the middle. So if we can scoot forward, just as a quick reminder, this webinar does not constitute an endorsement recommendation or approval of third party product services or any other offerings. Page is not liable for the content or offerings presented by participating technical partners. So thank you for that And we can start it off with, I hope I say this correctly, but Azo

Speaker 17 ([01:53:03](#)):

You are correct. So Yes, thank you and good morning everyone. Next slide. So we are a systems integrator developing control systems for microgrids, particularly solar batteries and using network and IT OT solutions to make the communications between all the DER devices work securely as well as providing an IO OT platform to interconnect your microgrid projects with derm systems, VPPs utility and ISO ISO systems to get the value stacks out of your assets. Obviously with proposing on community style microgrids, you have communications that need to be secured and enabled across larger geographic areas to connect together resources across the spectrum of the project. And again, we are a systems integrator. We bring all the technology together to make projects work. We have an energy IOT digital platform that then allows the central monitoring and visualization of the projects as well as how to interconnect them to other systems via API as well as provide central monitoring and lifecycle services to maintain and help support those assets for customers.

Speaker 17 ([01:54:31](#)):

Particularly ones that do not have their own built-in asset management type facilities who just want to make sure that their assets operate long-term and we can help with those. So that's a little bit of an overview for Esso here. So systems integration design, IO OT network, cybersecurity power automation, switchgear controls to make the circuit breakers and the electrons flow in the areas that they're supposed to cloud platform to integrate the assets into larger systems. DER controls to make the batteries do what the batteries are supposed to do when the batteries are supposed to do it and ramp control solar as well as add in other distributed generation, whether that be rotating equipment, fuel cells or other assets. Remote microgrid monitoring systems, fleet management systems for customers

who may have more than one, more than one microgrid. We're also proud to announce that we are approved as a preferred data provider for the California self-generation incentive programs, so SIP and we also provide kitted, pre-engineered communications metering and control equipment solutions so that we're not reinventing unicorns every time we go to build a project. So happy to meet with you all this morning and hope we hear from you and hope we can help you design the infrastructures to make community microgrids work. I appreciate the time everyone.

Speaker 1 ([01:56:14](#)):

Thank you so much. Jason, do we have any quick questions for Zo? Okay, we can move ahead. It looks like next up we have CE and T America. Are we joined by CE and T America today? Alright, we will share their information on the screen here for you all and maybe we'll just give them a minute in case they haven't joined yet. We are a few minutes ahead of schedule. Okay, let's move forward. If they join we can always scoot backwards and give them an opportunity. Let's see, perhaps this is them. Hang on one moment. I see we were just joined by Patrick. Are you with CE and T America?

Speaker 17 ([01:58:03](#)):

No I'm not.

Speaker 1 ([01:58:04](#)):

Okay. Alright well let's scoot forward. We will have Concord engineering group. Do we have our friends from Concord Engineering Group on with us today? Alright, well we can share their slides as well. Why don't we go ahead and take a quick five minute break. We are running ahead of schedule and if folks are looking at the time and thinking they'll join a little bit later to be on par with the agenda, we'll just give 'em a few moments to catch up. So why don't we pause here for a moment and then we will regroup in about five minutes. All right, we'll start back up. Do we have our friends from CE and t America on or anyone from Concord Engineering? Alright, we can move forward. Next up we have energy vault.

Speaker 7 ([02:03:42](#)):

All right, I am here. This is Craig. Thank you everybody. This is Craig Horn, vice President Advanced Energy Solutions at Energy Vault. We are headquartered in Westlake Village, California. I'm stationed in northern California. We are a publicly traded company with close to 200 employees and our main mission is to provide energy solutions that accelerate the transition to renewable energy and we are the only energy storage company out there providing customer-centric solutions and we span everything from shorter duration solutions that are comprised of lithium ion and we have several facilities underway and in the ground and operating today up to ultra long duration energy storage. To date, we have over a gigawatt hour of energy storage facilities in operation in California and Texas or under construction with one primarily going on here in California and also in Nevada. We worked with utilities, pg and e, NV Energy as well as private developers, widely held companies as well.

Speaker 7 ([02:04:56](#)):

We have expertise in several different areas. Our main focus is being a turnkey solution provider, providing design engineering permit all the way through to commissioning and operations of multi megawatt, front of the meter energy storage solutions. We also have microgrid control capability that we're employing on a project with pg e in Calistoga that I'll talk about in a few minutes. And aside from our capabilities, we specialize in optimizing costs, resiliency benefits and sustainability of the solutions

for hardware and services. And our software suite can do everything from operations to asset management to dispatch optimization in the market. Next slide please.

Speaker 7 ([02:05:45](#)):

So at the heart of our microgrid offering is what we call our H vault solution and it's designed for community resilience and there's three really two main components to it. On the hardware side there is the B vault, lithium ion based energy storage products that we have. It's a proprietary design for front of the meter applications and then hydrogen fuel cells with liquid hydrogen storage that gives us long duration multi-day capabilities with our Vault OS software at the front end providing the seamless integration of both of these elements into the utility network during blue sky operations and then microgrid operations during an event. It is there when you need it. It is emission free and it has black start capabilities and also designed with a high degree of safety. Next slide please.

Speaker 7 ([02:06:44](#)):

This is the project I mentioned before. It is a 8.5 megawatt multi-day duration microgrid solution for the city of Calistoga up at the north end of Napa County. It's a project we've been working with under contract with PG&E for the last about two years now coming on, it'll be an operation this summer. Construction started last or in December. The major elements of this, we have four of our B vault energy storage cabinets, lithium ion based products. They're the smaller white cabinets you see at the top in the middle. And then we have six plug power fuel cell units that are providing base power. The lithium ion batteries are providing the blackstart and shock absorber ramping capability for the overall system. We have onsite liquid hydrogen storage in this large tank you see up at the front and then the hydrogen distribution system. So we're bringing all those different elements together.

Speaker 7 ([02:07:46](#)):

We have our vault OS EMS that's integrating all those and optimizing that for dispatch to the grid. So all four different elements of this solution, the development and origination, the solution design and engineering, the procurement construction and commissioning. And finally the operations. We're providing all those different things here for the city. Any one of those different aspects we're happy to partner with folks in as well or provide a turnkey solution depending on the situation. It's been great working with PG&E on this and we're really excited about this coming up. It's been a challenging project but something that we're really excited about and you can see here in the bottom right hand corner the map of the city that roughly that's the area that this microgrid will be energizing for the PSPS events feature. So that's all I had. If there's any questions, happy to answer.

Speaker 1 ([02:08:51](#)):

Thank you Craig, do we have any quick questions for Craig? Okay, let's move on ahead. Looks like next up we have GHD.

Speaker 18 ([02:09:06](#)):

Hi everyone. Can you hear me? For some reason I lost the presenter's link. Is it working this way?

Speaker 1 ([02:09:12](#)):

Yes, you're good. Thank you.

Speaker 18 ([02:09:14](#)):

Okay, great. Thank you. Sorry about that. So my name is Kim Del. I'm the market lead for Future Energy at GHG here in California based in Irvine. You have my contact information here on the slide. GHG is a global professional services company, started almost a hundred years ago in Australia. Since then, we have grown to over 160 offices globally including 12 in California from Eureka Redding all the way down to Irvine where I'm based and San Diego and you have the full list again on the left. We provide engineering, environmental advisory, architecture, digital and construction management services in five global markets, water and wastewater, energy and resources including microgrid, environment, transportation and property and buildings. We are really one connected network of 11,000 professionals with about 500 here in California. And of importance, we are a hundred percent employee owned. Our vision is really to create lasting community benefit with our clients and the communities we work in. And as part of this vision, we have what we call our future energy initiative, which is really our commitment to help our client lead the transition to an affordable, reliable, secure and low carbon energy future. So as part of that we do have great microgrid services and capabilities. So if you can please jump to the next slide.

Speaker 18 ([02:11:00](#)):

So you can see we kind of covered the project lifecycle, starting on the planning phase with energy modeling, conceptual design for the microgrid and support for grant application permitting, support coordination with utilities and p g e here in this case. And then moving on to design engineering phase. We can cover preliminaries through final design on all the major disciplines, civil, electrical, mechanical, et cetera. We have good CADA capabilities to integrate with existing facility operations. Key expertise in cybersecurity, which is a emerging topic and then we can support the different resources for the microgrid from cogen units to all the renewable energy, solar, wind, biogas or renewable natural gas hydrogen. I think you can see my background on it. It's got and energy storage systems and then we continue to provide support on the implementation phase with construction management, startup commissioning and support and grant management.

Speaker 18 ([02:12:18](#)):

We just like the colored boxes, we have good experience behind the meters. Some experience with the newer front of the meter microgrids. We are flexible to work on different contracting mechanism as you can see from design build all the way to esco. We are technology agnostics also and so that's kind of like our main value At the bottom you can see just a couple of projects examples. We have supported the McKinleyville community services district microgrid basically helping them getting funding, selecting their preferred implementation methodology and then serving as owners representative. We have also worked with or helped the Blue Lake Ranch area community microgrid and providing electrical plans and specifications for the project's improvement. And finally we've also been owners engineer for a number of solar diesel microgrids for First Nations in Canada. And yeah, if you want to know more need help, just reach out. Thank you.

Speaker 1 ([02:13:32](#)):

Thanks so much Kim. Do we have any quick questions for Kim? Alright, next up we have PAE consulting engineers.

Speaker 19 ([02:13:50](#)):

Can you hear me okay?

Speaker 1 ([02:13:52](#)):

Yes, thank you.

Speaker 19 ([02:13:53](#)):

Perfect. Hello? Hi. Hello everybody. My name is Karina. I'm with PAE consulting engineers. So we are a building consulting engineering firms. We're a little bit different from I think some of the others on the call today. We are based predominantly on the west coast but we work nationally and internationally as well. Our California, we have both the northern and southern California offices. And yeah, as I said, we are building, we started with the building and kind of worked up from there and got into the more of the district and the campus and the city scale systems. Our vision is a world of clean energy, water and air for all. And within that we are a triple bottom line company and so that means we prioritize people and planet as well as profit. And so within that we very much feel that microgrids achieve both our mission on the sustainability side as well as energy resilience, which we consider to be a key people issue our services.

Speaker 19 ([02:14:52](#)):

So because we come from the building and started at the building scale and worked our way up, mechanical, electrical, plumbing. And then from there I've expanded to campus scale the renewable energy systems that we're talking about here today as well as district planning. I'd say the thing that our secret sauce is that our analysis and modeling teams because we understand building so well and we have such a strong analysis in modeling group in that that's really what has helped I think with a lot of our microgrid work in being able to really understand what's happening at that micro level and then pulling it up to the macro level with that analysis work. Let's see, maybe next slide.

Speaker 19 ([02:15:40](#)):

Thanks. So we wanted to actually focus on the analysis and modeling a little bit if anybody has questions on projects. So I'm certainly happy to share out afterwards. We do, like I said, we work everything from small single buildings to large single buildings to campuses to districts up to our largest systems or utility scale projects up to about 80 megawatts. It's about as high as we go. But within all of that, what we kind of view as sort of our connecting thread is again this analysis and muddling work and really, really understanding what's happening within all the building systems, the electrical as well as the mechanical and the plumbing and how all of those loads fit together and what's the best way to operate them in both grid connected and resilience modes. Because of that, we've actually, we tend to develop our own tools internally to help with that analysis and modeling efforts because we have found that we need to answer questions that sometimes the third party software companies can't answer.

Speaker 19 ([02:16:35](#)):

And so this is just an example of one of the internal tools that we've developed that allow us to get really granular so that we can work with projects and clients to really understand what the needs of their systems are and how we can best achieve them with our microgrid. We are like the previous speaker, we're also a technology agnostic. Our services are really more on the design and then we help support on the construction administration side. But again, our real core is that we are kind of best in class on the engineering side of things and are able to then work with our trade partners in the implementation and deployment of the systems. From that kind of technical engineering perspective, I think I can probably open it up to questions.

Speaker 1 ([02:17:30](#)):

Thank you Karina. If there are no questions right now, I did see a few more folks join. If we have anybody from CE and T America or Concord Engineering, we can open that up as well. Okay, well with that we are about 10 minutes ahead of schedule and we are right up against our lunch break, so we are planning to return at 30 after the hour, so 1230 everybody can have an opportunity to go grab some food, refresh yourself and then we will start back up with the rest of our engineering group,

Speaker 20 ([02:51:49](#)):

The wire.

Speaker 1 ([02:53:17](#)):

Hi all. We have about five minutes left in our break.

Speaker 13 ([02:56:59](#)):

Can somebody mute whatever.

Speaker 1 ([02:57:53](#)):

Hi everyone. We have about one minute left in our break As folks start to trickle back in, I'll just give a couple quick reminders. If you are not actively presenting or asking a question during a designated q and a time, please mute yourself. You are in control of your own mic and camera. We do have a q and a function, so if you have questions, please feel free to throw it in the q and a, let us know who you're directing the question to so that we can try to monitor and answer on an ongoing basis. We are giving our technical partners about five minutes to present and we do our best to keep to those times and this webinar does not constitute an endorsement recommendation or approval of third party product services or any other offerings. Pge is not liable for the content or offerings presented by participating technical partners. So we are right at 30 past the hour we'll get going with the next half of our webinar. We have the second half of our engineering group, so we will kick it off and I believe this is pronounced pece Energy Solutions.

Speaker 1 ([02:59:21](#)):

If we don't have anybody from Pece Energy Solutions on just yet, we'll give it just one more minute to join. Do we have any friends from Pece Energy Solutions on with us just yet? Okay, well we can scoot forward and give an opportunity to circle back at the end. Do we have s and c electric company?

Speaker 21 ([03:00:22](#)):

Yes. Hello, can you hear me?

Speaker 1 ([03:00:24](#)):

We can. Please go ahead.

Speaker 21 ([03:00:26](#)):

Thank you very much. Go to the next slide please. Thank you. So my name is Peter Curtis. I am with s and C Electric Company. We're one of the largest companies you probably have never heard of, but we make a lot of the green boxes that as protection equipment that exists scattered throughout pretty much every community in the country. SNC has a worldwide presence. The headquarters in Chicago, I'm

actually based out of Colorado, SNC, started off as a protection equipment company, so doing smart restoration, protection of distribution systems, keeping the lights on and has taken that effort into smart grid, grid edge control and microgrids company consists of about 3000 people. It's a global presence and has been in business for over 110 years. So a very, very established company like some of the other companies mentioned, we are a hundred percent employee owned and the area of expertise that s and c brings to this particular group, as mentioned obviously by some of the other participants, we're very big into microgrid design controls and commissioning.

Speaker 21 ([03:01:49](#)):

We have over two decades of expertise in that. We also developed and have our own microgrid controller designed very specifically for microgrid. It's not a repurpose controller, it is designed to make your installation and commissioning and controls of the microgrid, rapid development, rapid commissioning and basically gives a whole built-in library of a lot of extensive microgrid functions. It's also configurable. It was originally developed for government purposes and so we get a little paranoid about cybersecurity. So it has a tremendous amount of cyber secure infrastructure baked into it In addition to the controller s and c also has a number of groups that do analytical studies and system engineering could be anything from feasibility design or feasibility studies to the microgrid design. Any of the studies that you would need to do spark or flash studies, really any kind of engineering that's necessary to make your microgrid work. S and c can support as well. As I mentioned, the cybersecurity design. We also offer field support educational workshops and anything that people might need in order to get fluent with what they're intending to put in the ground. Go to the next slide please.

Speaker 21 ([03:03:26](#)):

So this is just some of the examples of projects that s and c has engaged in. The upper left, this is a microgrid in Illinois, it's actually owned by a utility, kind of a demonstration, but it is a microgrid with an extensible boundary. So they can provide power just to their technology application center or they can extend it out to actual customer loads and be able to satisfy those loads in the case of a area outage going clockwise around in the upper right we've got, this is a DOD installation that's in the middle of the Pacific Ocean, and this is a kind of unique one. They were running on diesel gen sets, but by putting in the microgrid a bunch of pv, a bunch of storage and then intelligent management of that and they're able to save something like \$800,000 a year in diesel fuel in the lower left got, this is an egg farm on the island of Oahu.

Speaker 21 ([03:04:32](#)):

This is entirely off grid. So the cost of connecting to the grid in this case was quite expensive. They wanted to run an entirely independent facility and our grid master controller is running this particular facility. And then in the lower right, this is a micro grid that's up in North Bay, Ontario. So in a very cold environment. And one of the things that that means is they have a couple of CHP combined heat and power generators. So they are able to use the waste heat from those generators to satisfy heating loads and things like that at the facility. But because these generators run all the time, this particular microgrid is able to ride through an unanticipated utility outage. So they could be running along humming fine, and then the power grid goes out. We very, very rapidly switch all this equipment into island mode and disconnect from the utility. So in effect, they don't know that they've experienced the utility outage. So just giving you some examples of the kind of work that SNC does along with some examples of where the control has been used. I'm certainly open for any kind of questions here and I realize I'm the first one to speak after launch that toys not the most enviable of physicians to take your

Speaker 1 ([03:05:57](#)):

Hi Jeremy, I see your hand.

Speaker 3 ([03:06:00](#)):

Yeah, hi. Let me get the questions flowing. I'm just curious, Peter, thanks for the presentation. I'm curious. Lower right, you have 10 kilowatts of pv, which seems negligible compared to project size

Speaker 21 ([03:06:15](#)):

And it's, it's a negligible amount. It was more for show they originally had an intent to put a lot more renewables out there, but as you can tell from the background, it's not exactly the sunniest place. And so halfway through at about the 30% design level, they decided to go with something that was much more of a showy pv. You are exactly correct, the PV here is somewhat negligible.

Speaker 3 ([03:06:48](#)):

Okay, thanks.

Speaker 1 ([03:06:52](#)):

Thank you. Do we have any other questions for Peter? I, all right, let's move on forward. Thank you so much. We have Schneider Electric up next.

Speaker 22 ([03:07:05](#)):

Yep, this is John Westerman with Schneider Electric. I'm ready to go. So I am pitch hitting for Scott this morning. I got an email from him at 6:00 AM that he couldn't make it. So I'm jumping on in the middle of the movie here. So I'm with the Schneider Electric. Schneider Electric is a global 100 company that provides basically electric infrastructure. We have a microgrid group that was ranked number one by guidehouse last year as the number one microgrid integrator in the United States. We have our headquarters in Boston, a number of offices in California, like the previous presenter, it's not clear people know who Schneider Electric is, but we have some well-known brand names in the market under Square D. In a lot of electric rooms you'll see Square D equipment. We have ASCO for automatic transfer switches, the number one provider of automatic transfer switches in the market.

Speaker 22 ([03:08:11](#)):

We have a PC which develops Uninterruptable Power supplies. We have Auto Grid who supports virtual power plants and management of distributed energy resources. And also notable is etap, which is a company that has a software system for modeling electric energy systems. I think that a couple of things that people haven't touched upon so far is that developing microgrids is pretty much a team sport. There's not a one company that does everything. So typically when we're working on projects, we're working with multiple team members that bring different aspects to projects. And so we have different ways of supporting various projects. But for the companies that are on this call today, we've worked with projects with a O, we're integrating with them. We've worked on projects with PAE and some of their engineering designs on some of our microgrids. We're working with our joint venture Alpha structure, which is going to be presenting in the next section, which is Energy A Service.

Speaker 22 ([03:09:28](#)):

We're working also with Scale Microgrids, which is a pretty innovative microgrid developer with a lot of projects in California. So we work with them. And then we've also done projects with s and c Electric. So the typical idea is in terms of putting together a good team that can work together to develop the solution, provide the technology and it all together. And so from a Schneider Electric perspective, we can be a technology provider. And in the next couple slides I'll show you what that means. We also have engineering services for designing microgrids. We can do turnkey projects and also provide operation and maintenance. And then we also have our joint ventures with energy to service. I think I'm going to jump down to the next slide after this one that makes it a little bit more clear. So we typically look at the developing a microgrid solution in different layers.

Speaker 22 ([03:10:31](#)):

So look at, I'm going to read this slide from the bottom to the top. Basically we start with the onsite resources, the distributed energy resources. Schneider does provide a battery energy storage system, but we don't provide anything that actually generates electrons or electricity. And so that was what I was talking about earlier and having partners. So we integrate with third party providers of generating equipment, which includes solar engine generators, fuel cells, whatever the technologies are that need to be integrated for the distributed energy resources at a site. And then we connect them together through medium voltage and low voltage electric distribution technologies that include the relays and the metering and those, that's kind of the bread and butter for Schneider Electric. We make the boxes that bring everything together and provide the intelligence for managing and distributing the electrons within the system. And within our smart switchboards, which we call our energy control center, we have a local controller which communicates to each of the DER and then understands their operating characteristics, the capabilities of the systems within the boundaries and manages them locally, including using the onsite controller for when the grid goes down and we're operating in a resilience mode or off grid island mode.

Speaker 22 ([03:12:12](#)):

And then that is integrated into a cloud-based software system that allows us to do other elements of optimization of the microgrid solution operations in terms of getting energy forecast, storm warning forecasts, being able to develop load profiles to inform the dispatch of the assets and maybe what your solar production is going to be on a day-to-day basis. And then I'd mentioned earlier that we have an application from Auto Grid, which is a virtual power plant, which is from a community microgrid standpoint, allows the ability to aggregate distributed energy resources within that control area that was provided, that was talked about at the very beginning, and be able to generate additional revenue with those assets to improve the economics of the overall solution to bid into Cal ISO or perhaps a pg and e demand response program or other elements like that. And then I'll just kind of finish up, I wanted to provide examples of three projects that might be of interest. So the first one is that we have a microgrid at the

Speaker 1 ([03:13:35](#)):

Corp apologies, but to jump in, we are right at time, I'm sorry. So we do need to scoot along. However, if we have time at the end, we can open it up to some questions if anybody has it, and these slides will be made available.

Speaker 22 ([03:13:50](#)):

Thank you.

Speaker 1 ([03:13:52](#)):

Thank you John. Next up we have Site logic.

Speaker 23 ([03:13:59](#)):

Alright, I am here. Okay, good afternoon everybody. My name is Jessica Ritter and I am one of Site Logic's local government relations representatives. There are actually a few of us from Site Logic on this call today, so we would be happy to field any questions that you might have at the end. Alright, so Site Logic on Build Clean Energy firm with over 400 employees nationwide, 5 billion in constructed projects, over 11,000 customer sites resulting in over a billion dollars saved in energy and operational costs. We provide guaranteed fixed costs, guaranteed workmanship and savings and we find the share of cost money needed to complete your project. Excuse me, just getting over a cold. Next slide please.

Speaker 23 ([03:14:54](#)):

The Design Build approach allows us to be the single source of accountability and responsibility from conception to completion. Our goal is to make this project as hands-off for you as possible. Site Logic is proud to be accredited at the highest level by nasco, the National Association of Energy Service Companies as an energy service provider. We also believe in the importance of supporting the statewide local government organizations that support you, including the California State Association of Counties, the League of California Cities, and the California State or California Special Districts Association. Just to name a few. Next slide please. Alright, now to wrap up our presentation, we have listed here a few of our local government clients across the state. These include cities, counties, and special districts. We here at Site Logic have extensive experience implementing federal, state, and utility programs for California local governments and have several office locations throughout the state to serve you. Last line please. Alright, so here is my contact information. Please feel free to reach out if you have any questions or would like us to take a look at your project. Thank you.

Speaker 1 ([03:16:15](#)):

Thanks so much. Do we have any questions for Jessica or the site Logic team? Alright, great. We can scoot on forward. Next up we have Unison Energy.

Speaker 24 ([03:16:32](#)):

Hi, I'm Jen Hunt from Unison and a little bit about our company. We are coast to coast. I'm in Walnut Creek, California, myself, but we have offices in Connecticut as well. And then we have sites from Maryland, the Northeast up to California and Sonoma and San Jose. We do like many of the other companies here is Design, procure, operate, and then Build and Own. Mostly we have the option as several others do of doing just a complete project and hand it over to a site owner or we keep it on ourselves and do the operations and maintenance. Let's see what else I wanted to say. We are agnostic on the type of generators. We do solar, we do combined heat and power and fuel cells really up to the site itself and I think that's probably about it. I think I've seen a lot of the other vendors here. We've worked with a lot of equipment before that I've seen from Snyder and SNC and any questions? Thank you.

Speaker 1 ([03:17:55](#)):

Thanks so much Jennifer, and if anybody has any questions for any of our previous presenters in the last group, we can open that up as well. I'll also give the opportunity, I know coming back from lunch, Pls was not with us. If they have joined, we can scoot back if needed. Okay. Looks like we are good to

move forward. We are in our last group of technical partner presenters. As a reminder, this webinar does not constitute an endorsement recommendation or approval of third party products, services, or any other offerings. Pg and e is not liable for the content or offerings presented by participating technical partners. This group, we have finance and our first presenter from Excelsa by Cummins.

Speaker 25 ([03:18:58](#)):

Hello.

Speaker 1 ([03:19:00](#)):

Hello.

Speaker 25 ([03:19:02](#)):

Hi, my name is Damika with Cummings or rather Excelsa by Cummins and I'm with the Cummings Clean Energy Business Unit, which is Accelerate. It's a branding as well as a business unit for Cummings. Many of you probably have heard of Cummings. We have been in diesel engine, diesel generator, natural gas engine, natural gas generator business for a hundred plus years and the clean energy business unit is really just clean energy. The fuel cells is probably the fuel cell. Power systems probably the most appropriate product for this group. And we are not tied to any one microgrid provider, even though we do have a microgrid controller of our own, we don't push that. We would rather work with the microgrid suppliers around the world for that matter, rather than push our own MICROGRADE controller. We would use that if somebody came to us and said, Hey, you know what? We want everything to be supplied by Cummings. If we are to use your, whether it's a fuel cell power system or a diesel generator, natural gas generator, then we'll put that in. Otherwise we are happy to work with anybody that spoke earlier who are microgrid providers. So I would like to have the opportunity to work with any one of you who are interested in fuel cell power systems. That's my focus for Excelsa by Cummings. I can also engage my colleagues on the diesel and the natural gas side if that's what your interest is.

Speaker 25 ([03:20:59](#)):

If you have any questions, I'll try to answer this kind of covered, what I said was covered in this one, so when you get the presentation you will see this. So if you have any questions, I'll be happy to answer.

Speaker 1 ([03:21:29](#)):

Thank you so much. Let's scoot on forward. It looks like next up we have alpha structure.

Speaker 26 ([03:21:41](#)):

Hi and thank you for having me today. My name is Kevin Marquardt. I am the director of energy Markets and policy at Alpha Sr. Alpha. SR is a joint venture that was created through the work of both the Carlisle Group, which is an organization that supplies capital for a microgrid projects across the United States and Schneider Electric, whom we heard from a little bit earlier, alpha Sr, is unique in the sense that we develop microgrid projects that are energy as a service. And so we bring capital to the table using Carlyle Group to help pay for some of the costs associated with deploying a microgrid. Through this structure, we are a end-to-end microgrid developer who can help clients work through designing, financing, building, owning, and ultimately operating and maintaining a microgrid system. And we develop custom solutions for our clients, really focused on trying to find solutions that meet unique needs for specific client design requirements.

Speaker 26 ([03:22:52](#)):

We are focused on developing key work around resilience for communities and looking for opportunities to help support communities who are interested in trying to advance their own energy needs through the lens of energy as a service. The model is structured in a way where we bring upfront capital to the table for a client that we're working with and essentially the client will have a fixed annual payment that they would make over the course of a term which could be 10, 15, 20 years through our energy as a service agreement with our clients. The customer does not have to have as much upfront capital in order to have a project to be successful. They can essentially have a much lower annualized payment and leverage our as a service model, which is unique in the sense that we are able to stretch out the cost for a customer without requiring them to bring a larger upfront cost to the table.

Speaker 26 ([03:23:53](#)):

If you want to go to the next slide, I'd just briefly highlight a couple of the projects that we're currently working on through the partnerships that we're doing today. We're currently working on building out a new terminal one, which is at JFK and it'll be the largest clean energy airport microgrid in the United States. And this particular microgrid is one that is a great partnership that we're doing with the airport there to help deploy the largest rooftop solar array in New York City. And we're really trying to develop this solution to be focused on greenhouse gas reduction as well as providing ample power supply for the JF Care airport, which resilience is key for them as they're trying to ensure that operations continue to work regardless of storms or other activity that might occur. We also have great partnerships with Montgomery County, which is a county in Maryland where we're working on two different microgrids that I wanted to briefly highlight here.

Speaker 26 ([03:24:50](#)):

The first one is the largest clean energy transit microgrid that has been announced and it's operational as of a few years ago. And this one is really focused on allowing this community, Montgomery County in Maryland to be able to run 70 e buses and helping them to really stand alone a microgrid that allows 'em to full control of their energy, power and allows them to essentially deliver resilience of the community. The power that is produced from this particular site actually powers all of the communities electric needs for all of the electric lights and streetlights within their community as well. And from this particular project, we went from signed contract to operational facility powering the 70 e buses within 13 months. So we are really focused on speed and scale with the projects that we're working on here. This next one, MOC is one that we recently announced that we're working on, which will be the largest clean energy transit microgrid, which will incorporate on onsite green hydrogen and we'll also be able to power three times more zbs than the previously announced project. These three projects are ones that we're actively working on today and we'd love to work with communities to find similar opportunities where communities may be interested in trying to advance their own resiliency and also looking for opportunities to provide their local power.

Speaker 26 ([03:26:19](#)):

Thank you so much.

Speaker 1 ([03:26:21](#)):

Thank you Kevin. As a reminder folks, please mute yourselves if you are not actively presenting. Do we have any quick questions for Kevin? Okay, thank you so much. Thank you. Next up we have electric power.

Speaker 27 ([03:26:43](#)):

Good afternoon. Can you hear me okay?

Speaker 1 ([03:26:47](#)):

We can. Thank you.

Speaker 27 ([03:26:48](#)):

Great. Alright, so my name is Steven Honickman. I'm with Electric Power. I help bring our sustainable community networks programs into the communities that we're serving. Our company's mission is basically to ensure equity and inclusion in the clean energy transition, and that is the nice little soundbite that goes into our Sustainable Community Networks program, which has a focus on making sure that low to moderate income community members can participate in that clean energy transition. I think unlike a lot of typical approaches to microgrids, we start from the very bottom of the consumer stack. We're talking about individual homes. Electric power has been around for almost a decade. We've been making residential scale energy storage systems the whole time. Our name electric was selected because we're hopefully making a little bit of a higher IQ source of electricity that can get put into a home. And our go-to-market includes a lot of typical channels where we'll sell our smart home batteries to installers, but we created the sustainable Community Networks approach as a part of our services offering, which we've paired with a \$300 million financing facility that has as one of its hallmarks, no minimum credit score for participants to have to run through.

Speaker 27 ([03:28:16](#)):

So that really opens up and to our desire to expand access into the low to moderate income community enables that cohort of folks in communities to access a solar microgrid for their own home. There's a picture on the right there of what our particular energy storage system looks like and we are currently serving about 18 communities nationwide, Puerto Rico, Washington dc. Our first communities on the East coast have been brought online, but the 300 million that is mentioned on this slide is specific to our California deployments and those are basically currently available to any community that we engage with and this is a key feature of the program. If you want to go to the next slide, I can then go through that where there's a little more information. Our ability to offer these residential solar microgrids to the low to moderate income community. And just to be clear, it's not exclusive to the LMI community, it's just that that is the community that has had the hardest time accessing clean energy without being able to go through their own.

Speaker 27 ([03:29:32](#)):

They don't have access to the capital or the financing that many other communities do. We're giving them the opportunity within their community to sign up for a system that gives them sustainable energy, affordable at an affordable price. And because it's a microgrid, there's resiliency. So they do not suffer power outages. And at the same time, we're able to offer that only by partnering with a local community who helps then us as a company know how to sensitively and appropriately reach out to that low to moderate income community to make sure that they don't feel like they're being taken advantage of by a company that they may have never heard of or have been dealt with poorly by solar providers in the past that are who we do not want to be associated with in terms of making sure that there is a really transparent and effective program that is brought to a community.

Speaker 27 ([03:30:21](#)):

So basically we set up a partnership with a local community, a city government, a county government, a community-based organization. It's a non-exclusive partnership, so there's no need to feel like we're sole sourcing things, but we work with that community through that partnership to then create the Sustainable Community Network initiative, which is provided to the local stakeholders, constituents. And there's an education and an outreach component that allows them to find out if this program makes sense for them individually. We want this to be invitational and participatory as opposed to a hardcore sales approach. As I mentioned, if someone is interested in having a solar array on their roof and an energy storage system installed on their home, they would be able to have that system installed for no upfront cost through a fairly customer. Well, it's a consumer centric, consumer friendly power purchase agreement. It has not just no minimum credit score, but it's an easier billing approach.

Speaker 27 ([03:31:29](#)):

It's got better customer service terms, a good warranty, et cetera, et cetera. We don't present that to the community until a local stakeholder that we've partnered with has reviewed it and so that the constituents can take our partner's word for it, not our word for it. This is a good program for their constituents to consider. The PPA is offered today at a 24 cent per kilowatt hour rate. There's no sort of strings attached to that. It doesn't matter if it's coming from the battery or the array. If you buy a kilowatt hour from the system, it's at 24 cents. That equates we hope to at least a 20% savings over current utility rates. And that gives the consumer some initial savings. They have the battery, so there's resiliency in the case of there's a public safety power shutoff event or just an accident that takes out a distribution node.

Speaker 27 ([03:32:26](#)):

But the key that makes this valuable to the industrial utility community and any load serving entity for that matter is these systems are designed from the ground up to be the building blocks of A VPP, A virtual power plant that is then made available into our utility partners grid services community or not community grid services relationships. So we'll participate in demand response or ancillary services as appropriate. And that community, which on an individual basis has their homes now resiliently powered in the event of an outage, makes those outages less likely in the first place because hopefully the grid services that those batteries can provide can help de-stress the grid. And then as a final hallmark in this program, the partnerships that we sign up who have helped us validate for their community the PPA and help us do outreach into the local low to moderate income community, they end up participating in this program as a revenue sharing partner.

Speaker 27 ([03:33:34](#)):

And that actually is key to how we're able to offer the PA in the first place without the minimum credit score. I'm happy to share more details on how that works, but it is a non-inclusive partnership and that revenue share is basically in recognition of the support the stakeholder in that community is providing to us to go into market. And what we like to really point out is where it takes a lot of planning and effort and engineering and careful consideration to plan a full community scale microgrid. We can deploy these systems behind the meter on an individual basis basically tomorrow. So as long as it takes to have the PPA signed and the permit pulled, it's a couple of days to install these systems. And then once there's a footprint of those systems in a community, you have instant resiliency for those homes and then those systems, that fleet of homes actually becomes a significant part of the community, microgrids, generational or generating asset and capacity in that community.

Speaker 27 ([03:34:39](#)):

Like I mentioned, we're deploying in a number of communities already in California. I'm located in Santa Barbara, we're serving San Luis Obispo County, Santa Barbara County, San Luis Obispo County, excuse me, and Ventura County. We've recently announced a large footprint in the LA Basin area. We got our start in the Central Valley in pg e's territory. And we're looking to engage with communities that are interested in not only a community microgrid through pg E'S MIP program, but who might be interested in having something for their low to moderate income community to access if they're interested on a much faster basis. So it, I'll take any questions there are any and appreciate the opportunity.

Speaker 1 ([03:35:27](#)):

Thank you so much Steven. Looks like we can scoot forward. Next up we have scale microgrids. Do we have anyone from scale microgrids with us? Okay, we are just a couple minutes ahead of schedule, so why don't we actually, we can scoot forward and then loop back to scale if they join us by the end. Next up we have Sunova Energy International.

Speaker 28 ([03:36:21](#)):

Hi there. This is Adam Miller, the VP of Microgrids with Sunova Energy. We are based in Houston, Texas and active coast to coast in the United States as well as in Puerto Rico, Sipan, the US Virgin Islands and Guam. We were founded in 2012. We're a publicly traded company with now over 419,000 customers. That's as of our our Q4 2023 report in California. We have active and connected about 35 megawatts of storage across over 4,000 customers in Houston. We operate a network operation center that's 24 7. We're somewhat unique in the market in that we are a service first company. You'll see that as we talk about our products. We're focused on, of course, solar storage. We do standalone storage projects as well as EV charging. And then in the financing realm we offer third party programs such as the PPA and lease with production guarantees. On the customer own front, we underwrite loans as well as due cash transactions on the engineering side in California, we are licensed contractors.

Speaker 28 ([03:37:53](#)):

We do EPC and design work similar to others in the workshop. We work closely with other development and origination firms. And on the product front as we'll get into on the next page, we are fairly agnostic. On the services side, we have an integration with a company called Watch, which does all of our monitoring on the commercial side of the business. And then we have a proprietary platform that we call Sunnova Sentient where we monitor grid conditions, our responsiveness to the grid condition and performance in the grid services programs. Somewhat unique in the market. We use our own services crews, so you'll see our trucks on the road. We do work with other contractors, but they're working to our specifications and our guidelines. Next slide please.

Speaker 28 ([03:38:51](#)):

So the Sunnova business model, you'll hear us referred to as an adaptive energy services company. And so I mentioned earlier that we're somewhat agnostic on the hardware front. As of 2023, we were the largest operator of Tesla's storage products in the world. And we have an API with Tesla. We service those products, but we're not exclusive with that particular product line. Now when it comes to microgrids, we want to make sure that we are designing for what the community specific needs are at the campus or the site specific microgrid that we have in mind. On the storage front, we're active with Franklin and Phase Fortress and the list is growing. And so when those technologies are active with us, that means that we've investigated the carbon impact of those particular products, their interoperability

with our service plans, and with every one of our service contracts, the technology is established in the contract so that it will be coterminous with the solar.

Speaker 28 ([03:40:08](#)):

And so that's what you see when we referenced the Sunnova Protect commitment here is that when we underwrite a microgrid, we're not only replacing parts in that service plan such as the inverters that will go projected to go right around year 16, but the actual cells themselves. So the idea will be that there's no out-of-pocket costs with the third party solutions that we offer. We're taking care of the insurance if there's any kind of theft or storm damage, we're handling that. And then we're using our predictive modeling as well as our service modeling so that we can ensure that the system is up and running and is there to be quite resilient. And lastly, I think from an origination standpoint, we're very excited about what the MIP will bring. I think there's a real community focus here that's reaching out to communities that want to do something about resiliency, want to raise the bar for sustainability. We know we're going to need solar and storage and mobility solutions to get there in California and nationwide. And so thank you for having us and others today to present.

Speaker 1 ([03:41:33](#)):

Thank you so much. Do we have any quick questions? Okay, let's move on Forward. We have Titan Energy Consulting.

Speaker 29 ([03:41:51](#)):

Hello. How's everybody doing? My name is Warren Tomlinson, I'm an independent consultant and I do this part-time. I am professor of physics at the Naval Postgraduate School. I'm PhD in applied physics and so I have a lot of experience in energy and renewable energy. And I got into this particular sector when I was asked to help a concentric power model microgrids, specifically a large municipal microgrid for Gonzalez, which is in the Salinas Valley here. My expertise is in modeling both energy as well as, and over the course of the last several years, I've worked with the pg e microgrid team for various reasons as well as with pg e itself. And I have definitely noticed, I watched the evolution of the program, the MIP when it first started to see mep, the Community Migrated Enablement program and has now become mip and it is a significant step forward in my opinion, in terms of incentivizing these structures.

Speaker 29 ([03:43:07](#)):

I'm extremely familiar with the pg e tariff structures as well as CE, which is the tariff that governs the micro grid that's produced with the C funding. Well with M funding I should say. And I believe it is a tremendous opportunity that quite frankly there are a lot of stakeholders out there that don't fully understand yet. I got a lot of experience with interconnection both from residential all the way up to utility scale. When I worked for three ce, which is the local CCA here in Monterey County, which is where I'm from, they had a desired develop municipal microgrid for San Juan Batista and ular two communities down here help them pursue federal grant funding, which is something else I would mention as well. The federal dollars that are out there to support these sorts of endeavors can go side by side with the MIP funding to help really supercharge these projects.

Speaker 29 ([03:44:05](#)):

I encourage all those out there to be looking for this whole effort by pg EI think is, as I mentioned, a huge step forward from where it was just a year ago. And I think this is just something people need to be educated on and I am happy to help anybody who needs the help to partner all the right people

together to get these things in the ground because I think they are going to be transformational. If anybody has any questions, my number and email are on there, please give me a call or shoot me an email and I'd be happy to help any way I can. Thanks.

Speaker 1 ([03:44:51](#)):

Any quick questions for Warren? Alright, that does wrap up our presenter overview. I do want to give a quick opportunity if Skill microgrids has rejoined us, we can scoot back quickly if needed. Alright, well if not, we open it up more generally. If anybody has questions for any of our technical partners who have presented for us today, we welcome any questions. Or if you just have general questions about the Microgrid Incentive program overall, we can open it back up with Jeremy and Andrea as well.

Speaker 6 ([03:45:54](#)):

Hi, good afternoon. This is Tony Pastori. Is it just open to questions? We can just shout 'em out at this point?

Speaker 1 ([03:46:03](#)):

Absolutely. Go ahead Tony.

Speaker 6 ([03:46:05](#)):

Great, thanks so much. Yeah, I'm curious how many, if you're at liberty to disclose how many applications and or pre-application, where are you with the numbers of applicants in the incentive program at this point?

Speaker 2 ([03:46:28](#)):

I can answer that. So we're not at the point where we have applications yet. That will come in April by the deadline of the 30th. But just yesterday we had our deadline for technical consultation met and we have 29 projects moving into technical consultation. So we'll see out of those, how many actually do apply, but really excited about the interest and all the good projects coming in.

Speaker 6 ([03:47:00](#)):

Great, thank you. And can you elaborate at all on maybe the geographic distribution of those and or are they in any other information broadly? Just high level,

Speaker 2 ([03:47:18](#)):

We have projects coming in from all throughout the territory actually, but I would say the majority come in from the north coast regions. Well, that is a pg e term, more the northern part of our territory. So where we have more projects than others, I would say would be Humboldt County, lake County and Plumas County. But yes, a good balance of local government and tribal customers.

Speaker 6 ([03:47:53](#)):

Great. Thanks Andrea.

Speaker 2 ([03:47:56](#)):

You bet.

Speaker 1 ([03:48:05](#)):

Do you have anybody else who has a question? Hi Jeremy.

Speaker 3 ([03:48:20](#)):

Seems like we lost steam on the questions after just one, which is great. It's been a long day before you wrap us up and send us out, I just wanted to close on the page side by thanking all the presenters who came in today. We had I think a couple dozen or more communities who are listening in right now, but also this is intended to be a lasting resource for parties. It's going to go up on our website and I will say we have gotten the question from, let me back up. This workshop didn't come about by accident. We've gotten questions from communities saying, who can we talk to about this? Who can we talk to about that? And I'm sure you can understand page isn't really in a position to say, oh, go talk to x, Y, Z company. So what we wanted to do was to provide a form where you all could come and present your capabilities to people live.

Speaker 3 ([03:49:27](#)):

But then also once it's up on our website, we can direct communities to our website and even tell them, look in this timestamp on the video, and then you'll see all of the people who work on origination, et cetera. So as Andrea pointed out earlier, we're only in tranche one. We have almost 30 applications, or excuse me, 30 projects going through. We have two more tranches to come in 20, 25 and six after this. So I know it was a lot of time invested today, but I appreciate it and it will continue to deliver value over the next couple of years.

Speaker 1 ([03:50:11](#)):

Thank you so much, Jeremy. The program email address is up on the screen. And as a reminder, we will be sending everybody the slides today so you're able to thumb through them at your leisure. And once we're able to remediate this presentation that we've recorded, it will be posted to the website as well, which is [page.com/mi](#). And with that, I think we can all say thank you and goodbye.

Speaker 6 ([03:50:41](#)):

Thanks so much everybody.

Speaker 1 ([03:50:43](#)):

Thank you.

Speaker 16 ([03:50:45](#)):

Thank you. Thank you. Thanks everyone.