

Eric Schiff:

Well, hello and good afternoon. Welcome to today's research and technology forum. I'm Eric Schiff, Interim Director of New York State's Center of Excellence in Environmental and Energy Systems at Syracuse University.

Eric Schiff:

Today's forum introduces a project starting here in Syracuse and in Central New York. It's been funded by the Department of Energy. It's part of a new energy program for innovation clusters or EPIC. Our EPIC project is intended to fertilize regional business activity related to energy and equity in buildings. The technology foci are energy hardware and interactivity with the electrical grid. The grid interactivity is often affectionately, nicknamed GEB.

Eric Schiff:

The Center of Excellence will be collaborating with CenterState CEO, a nonprofit business organization in Central New York, and we're co-funded by two offices at the Department of Energy, the Office of Technology Transfer and the Building Technologies Office.

Eric Schiff:

For today's program, we'll first hear from two government program directors and from some of our local project leaders who will describe some of the aspirations for our project and about how the project will work.

Eric Schiff:

After about 30 minutes of introduction, we're going to switch to taking questions from you, our listeners. There's a chat function on the GoToWebinar window that you should be looking at to send in your questions and I'll actually pose those questions to our panelists.

Eric Schiff:

Our first panelist is Monica Neukomm. Monica has been Senior Policy Advisor at the Department of Energy for more than a decade. She's presently the technology manager for grid-interactive efficient building at the Building Technologies Office. Monica's office co-funded our new project, as I have mentioned, with the office of technology transfer. So thanks.

Eric Schiff:

We're very excited to have this opportunity to foster and grow an innovation cluster in Central New York and we're keenly aware that this is first of all, part of the first EPIC program, but we're in fact, the first EPIC project focusing on building technology. So it's very exciting to us and a great chance to talk to you. Perhaps you could outline some of your and your DOE colleagues' aspirations for this particular project, which is an EPIC one with buildings.

Monica Neukomm:

Great. Thanks so much for the introduction and for having me be part of the panel discussion today. Hi, everyone. Always happy to talk about grid-interactive efficient buildings.

Monica Neukomm:

I'd like to start off really quickly, because I know a lot of people aren't familiar with the GEB acronym and you know, why we think that demand, flexibility and buildings is really important, sort of some of the key aspects of the GEB and then how that relates to this exciting project.

Monica Neukomm:

We at Department of Energy started working, really, and focusing on demand flexibility a few years ago, based on a lot of feedback from our stakeholders who have been working on energy efficiency for decades and we're really realizing the need for in addition to energy efficiency, also demand flexibility to better integrate growing, share-variable renewable energy to help reduce the cost of replacing aging electricity systems and infrastructure and to assist in achieving decarbonization goals, especially as we're looking at increased heating electrification in both buildings and in electric vehicles and being able to sort of shift the timing of load demand.

Monica Neukomm:

And also, just because of, really, the explosion of technologies and the capabilities through advanced controls, to optimize energy use for different needs dominantly, really, for customer preferences to make people more comfortable in buildings. And so when we think about a GEB, it's really starting with the foundation of efficiency, really that persistent energy load use, reducing it and then having technology that's connected, so having 2A communication with flexible technologies.

Monica Neukomm:

But not just being connected, also being smart. Having the ability to have data analytics and sensors and controls to really optimize for different inputs, such as whether occupant needs, prices, et cetera, and then really having the capability to be flexible, being able to optimize and take into consideration distributed generation storage and then being able to reduce shift or modulate energy use.

Monica Neukomm:

But we know a building in itself, even if it has these capabilities, of course it can be optimized for customer comfort. But if you're looking for that grid connection and being able to optimize would be responsive to grid needs, really we're looking at aggregation, right? Many buildings within a location have that sort of grid impact.

Monica Neukomm:

This is one area I really think that in addition to research advances, working with you all and in this project is really the capability. You know, we often use the term at Department of Energy, connected communities for this idea of being able to have multiple buildings to provide the benefits we know come with advanced flexibility.

Monica Neukomm:

I think this is one area that we really are looking at and we're hoping with the EPIC effort, in addition to a lot of work that maybe we've done on residential buildings, there's an opportunity to explore different building types, so there's mixed use, commercial, multifamily campuses, I think, with good opportunities to look across building types, as well as thinking through new business models and definitely thinking about greater DER integration and opportunities there.

Monica Neukomm:

I'll just close with a lot of times what we are looking for and I know we just recently, in addition to kicking off this project, we've just announced recently some additional sort of connected community projects, but we're really looking for documented performance on highest impact technology engagement strategies.

Monica Neukomm:

But beyond the performance of the technology, key, I believe key is the value proposition, better understanding what motivates people to want to adopt these technologies and use their buildings to have demand flexibility, to be grid responsive. And then somewhere related to that is just a business model innovation and what would motivate people to want to have businesses around the aggregation of demand flexibility? I think those are all really key areas that the EPIC project will be able to help answer some of the questions.

Eric Schiff:

Okay. That's a great introduction. I'll just mention for our listeners that Bing Dong who's also on camera at the moment is our local grid interactivity expert. And there will be a chance for your questions after we've introduced all of the panelists. So thanks Monica.

Eric Schiff:

Our second panelist is Ed Bogucz. He's a professor at Syracuse and former Dean of Engineering and was the founding director of the Syracuse Center of Excellence, the place that I'm sitting in right now, and I would say co-architect of this splendid building. And he is also a leader of this EPIC project. So Ed, a key to the success of this project will be engagement with regional companies that can bring significant energy-related innovations and building technologies to market and we sincerely hope will grow profitable businesses around them. Anyway, can you outline the main opportunities, as you envision them for companies and entrepreneurs who joined this project?

Ed Bogucz:

Thanks. Thanks Eric.

Eric Schiff:

Ed, you're still muted. Oh, okay. Yeah. You're on.

Ed Bogucz:

I think so. Can you hear me now? Thanks Eric. Thanks for your leadership of this project and the Syracuse COE. As I think about this project, I think back to the beginning of Syracuse COE, when it was established by New York state in 2002. And back then, green buildings were a new idea that people didn't know. What's a green building and who should care and why is it important and where are there opportunities for new products? I think we're at a similar stage with the idea of grid-interactive efficient buildings. So for companies, we're seeking and we're inviting a diverse array of companies to participate in this cluster and in our project.

Ed Bogucz:

We want manufacturers and we want suppliers of manufacturers and we want engineering firms and architecture firms. Ultimately, you ask the question, "So what's in it for the companies?" What are the opportunities that they're going to get out of participating? There's really two.

Ed Bogucz:

First is networking and networking seems like a simple thing, but it's really important in a regional innovation cluster. We will have at least one event of one type or another every month. And what we hope to accomplish with those events is bringing people together to meet one another and make connections. And again, it might be a supplier, it might be a customer, it might be a sponsor. It might be a partner. And really, right from the start when Syracuse COE was launched, one of our aspirations was to create, we called them intellectual collisions. We'd like a researcher to talk to a manufacturer that'll lead to a new idea for a product that neither one of them would've thought of on their own before.

Ed Bogucz:

And we've seen that happen over and over again over the last 20 years through the activities of Syracuse COE and the different programs that we've had for manufacturers of thermal and environmental controls and other innovators. So again, we're at the threshold of what we believe to be a big new opportunity with grid-interactive efficient buildings and just the networking is one of the opportunities that companies will have.

Ed Bogucz:

And then after the networking, we hope that we are going to provide resources that will help companies develop new products and new services. And there's a whole variety of different resources. I'm just going to quickly say five. So first is help with coming up with ideas for new products, so ideation. Second is understanding what the intellectual property landscape is for innovation. Third is support for research and development, including analysis and design of new products, testing proof of concepts of the first prototype of a new product to see if it performs the way companies expect. Fourth is help with finding early adopters in demonstration sites.

Ed Bogucz:

And then fifth is help with finding opportunities to secure funding and especially look for opportunities to help startups and small businesses pursue funding opportunities from federal sources like DOE, state sources like NYSERDA. For example, attendees probably are already aware that the federal agencies, DOE and others, have a large program targeted to provide funding to small businesses, small business innovation research and small business technology transfer programs, SBIR, STTR.

Ed Bogucz:

DOE will release its list of topics that they'll invite proposals for on November 8th and on November 12th, we'll offer an event for the EPIC participating companies to brief them on here's the list of topics, here's how you apply, these are the opportunities and this is how it relates to the [inaudible 00:12:31]. So again, it's about the networking and then the resources that we can help companies access.

Eric Schiff:

Okay. I think that's a good introduction and again, Ed will be around for questions after the short presentations and questions that I'm asking now, our finish. So thanks, Ed. Our next panelist is Joe Borowiec. He's been a program manager at the New York State Energy Research and Development

Authority for nearly two decades and has been involved with many energy products in our region of New York. So Joe, NYSERDA has been working for years in parallel with the building technologies office to cultivate technology advances in economic development in the built environment. So consistent with the EPIC project's focus on energy, hardware and grid interactivity, what do you and your colleagues at NYSERDA envision as the main market opportunities for New York State companies and of course, across the country?

Joe Borowiec:

Thank you, Eric. We see a tremendous opportunity across all building types in regard to energy hardware and building-to-grid interactivity. Our efforts are very similar, parallel to what DOE doing. We are referring to our efforts as intelligent buildings, buildings that are able to self-manage themselves, but also, be able to interact with the grid in some form of transactive energy market.

Joe Borowiec:

One of the challenges is the large commercial building space has pretty much, they have a base on which they can build on and expand their capabilities to participate or interact with the grid. I think where the largest opportunity is trying to get small and medium commercial buildings, single residential homeowners and multifamily dwellers, enabling the capabilities for them to be able to participate in a transactive energy market interacting with the grid.

Joe Borowiec:

And so I see that as fertile grounds, because this is a sector of buildings that doesn't have sensors, controls, metering to be able to manage their load or offer a load to the grid. So that's one sector that I see very ripe for a new technology and innovation.

Eric Schiff:

Okay. Well I'm sure that many people will be in touch with you over the next years. So thanks for that, Joe.

Eric Schiff:

Sarah Klee Hood is our next panelist. Her background includes commissioning as an officer in the United States Air Force and after her service, she returned to Central New York and is now Senior Director at CenterState CEO, which I mentioned is a partner with Syracuse Center of Excellence in Syracuse University in this EPIC project. So she'll be leading activities for our EPIC project at the Clean Tech Center, which she's the director.

Eric Schiff:

Sarah, could you just briefly introduce how the center supports new business ventures and especially, touch base with companies that partner with the EPIC project?

Sarah Klee Hood:

Sure. Thank you everyone. And thanks Eric and the entire COE team for your support as we engage in another partnership. For the GEB EPIC program, we're excited to provide program support to the cohort members through resources in areas such as IP and prototyping and similar to all other startups that are involved within the NYSERDA Clean Tech Center incubator. Services and resources such as EIRs, SMEs,

marketing, manufacturing and financial support will be available to the cohort members, as well, and I'm excited to be here. Thank you.

Eric Schiff:

Okay. So I'm going to move on and put aside for a moment, Juhanna Rogers, who was also going to be joining us shortly. I think we're a little bit ahead of schedule so far. What I'd like to do next is introduce two other people who haven't yet been introduced a bit and they'll be available for the Q&A. I'm not going to ask them specific questions. And then after that, we'll start the Q&A, unless Dr. Rogers is able to join us by then. She knew she was running a bit behind time and we tried to schedule her for the end.

Eric Schiff:

You can see Bing Dong on camera. He's been an engineering faculty member, both in Texas and now at Syracuse, where he is presently an associate professor and he's been working on grid interactivity and many other aspects of building, especially in collaboration with the Center of Excellence.

Eric Schiff:

These will be important parts of the EPIC project. And he's a co-investigator on that and also, associate director specifically for grid interactivity at the Center of Excellence. I think Ed already mentioned that we've got a seminar on grid interactivity on November 30th scheduled. There'll be contact information at the end of this.

Eric Schiff:

Not available by video, courtesy of the technology entanglements we all experience these days, is Bess Krietemeyer. She is unusual in that she is actually at the School of Architecture at Syracuse. She's an associate professor there and she's the principal investigator for an ongoing project, also funded by the building technologies office. Her project is about retrofitting buildings with very high-performance exterior panels that can essentially be attached to the building to improve them and also, mechanical pods, that again are modular and can be attached to buildings in modular ways that are intended for cold and very cold climates to greatly improve their energy efficiency.

Eric Schiff:

She'll be working with companies to ideate and innovate development of new technologies and projects that will be impactful for low and moderate-income communities. So we're still a bit ahead of time. What I'm going to do is to encourage our audience to go ahead and send in some questions and let's give this a minute or two and we'll begin to take the first questions a bit ahead of time and all right, let's see. Yes. Ed, did you want to chime in?

Ed Bogucz:

I'll just, I'm going to offer question zero while we're waiting for questions. And I'll say, I imagine there are more attendees saying, "This is a program in grid interactive technologies. Does my technology have to interact with the grid to be eligible for your center or for this project?" So how about Eric? I'll ask you that question.

Eric Schiff:

We're going to reverse roles here, Ed? This project is constrained to be about energy hardware and related issues. So grid interactivity is certainly part of it, but by no means is it intended to be exclusive. There are many interesting markets that would not necessarily involve grid interactivity.

Eric Schiff:

The welcome mat is open to all regional enterprises that would like to work on building energy efficiency and related synergistic things. As the COVID epidemic has shown us all indoor air quality and management of indoor air is really an important function, so we are particularly interested in products and innovations that address both energy efficiency and energy performance, as well as at the same time, improving indoor air quality, especially in a building environment. Efficient ways of doing that are very important. It's not intended to be exclusive, but it is one of our priorities is to find those projects.

Eric Schiff:

What Dr. Rogers will be speaking about, I hope momentarily, is the second thrust that I haven't emphasized so far, which is part of this project's opportunity, which is to look for innovations that would impact, let's say the poorer quality buildings in our community, which tend to be energy inefficient for which there are not a lot of cost-effective solutions to that energy inefficiency. So that's another thrust loosely called equity in energy and also, a second component of it that Dr. Rogers is likely to address will be what we can do both to reach out to our communities in the disadvantaged areas where the building quality is poorer, both to cultivate better ideas about what to do about it and also, to broaden the workforce to include members of those communities more commonly than they are now.

Eric Schiff:

Those are all parts of the project. We've got a lot of loose ends lying around we're going to be tying together, but thanks for the followup question, Ed.

Eric Schiff:

Okay, so let's see. I have a first question which I'm going to take and as I say, we'll interrupt when Dr. Rogers is able to join us. So let's see, let me go ahead and send this to Bing. So this is from Jason Dedrick and he writes, "Looking at the value change for GEB projects, what opportunities are there for CNY companies to participate and add value profitably?" Key question. So that's for you Bing. You're on the spot now.

Bing Dong:

Yeah. I cannot see the question, but ...

Eric Schiff:

Right. Well, I'll just ask ... I can repeat it if you like. It's, "Looking at the value chain for GEB projects, what opportunities are there for CNY, Central New York companies to participate and add value profitably?" You are certainly, I think, the local person who's best able to answer that question.

Bing Dong:

So I think, look at value proposition. One of the thoughts I have, why we use, we GEB and also, implement GEB technologies is from both sides from the grid side and also from the building side. So for the building owners, of course, GEB [inaudible 00:23:40] including energy efficiency, which will bring the

value to the building owners. And also from the grid side, not only in a deficiency where you use a grid load, but also load shift and shift the load to [inaudible 00:23:59] time will also bring the value to the grid side, which will reduce generator side of load and constraints. So it brings both sides, both really owners and also, the [inaudible 00:24:14] grid side.

Eric Schiff:

So what about the scale of the building? So for example, residents might have some solar cells on the roof or something like that. Whereas a larger building is likely to have a more substantial installation. Are both of those equally likely to have a GEB impact?

Bing Dong:

Yeah. So for building owners who have DR installed, yeah, it has much more dynamic because [inaudible 00:24:46] load profiles because P and various storage systems. Yes. It has even deeper or more complex impact on the grid side. Yeah.

Eric Schiff:

Okay, let's see. Question for Sarah. "The Clean Tech Center is pretty well-known in the area for fostering startup companies and they can, I guess, be in a large range of technologies related to clean tech. Do you see specific opportunities for the startup companies associated with the EPIC project that you're not able to always provide with your baseline funding from NYSERDA?"

Sarah Klee Hood:

Well, I'm going to answer that how I interpreted it, but if it was an asked question and I'm not hitting the mark, please, re-ask it. I will say that the focus of NYSERDA as it is within the Clean Tech Center is to encourage and engage startup companies that are looking to expand within in the Clean Tech Center, such as solar, wind, water, et cetera.

Sarah Klee Hood:

However, we do and we have found a natural niche here in the Syracuse area on building infrastructure, whether it be creating new products in technology or retrofitting to fit those old components that are already established within the community. And I think ultimately, at the end of the day, both the GEB program and the clean tech center program are aimed to help increase efficiencies within buildings, as well as to ultimately reduce energy loss.

Sarah Klee Hood:

So I think there's a lot of overlap and while it will be a one-on-one case for acceptance into NYSERDA's Clean Tech Center, I do anticipate there to be a high acceptance rate of the GEB program into our program because of the similarities and the ultimate goals that they're both after.

Eric Schiff:

Yeah. Let me just follow up with that. So one of the thrusts for the program, the GEB project, that we'd envisioned was to try to do more facilitating intellectual property for small companies. I know that's part of your 14-step plan for small companies, but we've been hoping to help financially perhaps with these funds to basically it's a collaboration with their Science and Technology and Law Center and other New York State centers at Syracuse University. Can you just let us know a little bit about how the current

startup companies that work with you are managing that kind of intellectual property and what opportunities you see for collaboration with the university?

Sarah Klee Hood:

Sure. One of the highlights of the NYSERDA Program is that you can receive milestones, which are submitted for reimbursement, I should say, from the program. There are 14 in total that all go along with the business roadmap that Ed had spoke about. There are three to four that are focused around IP and technology creation that any company in the technology sector would likely naturally find within the business roadmap.

Sarah Klee Hood:

Being a business incubator, traditionally what we would do here at the Clean Tech Center is we would reach back to the ecosystem and looking for that technology support, whether it be an engineer, a lab space, the financial resources or effort in filing that patent or the technology trade secret. What we're looking to do here is really expand that partnership with SU and reach back into their academics. So while the Clean Tech Center will be providing the upfront support, the actual effort and the man hours, if you will, to get that prototyping in IP will be provided through support with SU.

Eric Schiff:

Okay. I think that clarifies that a bit. So here's a question I'm going to pitch at Bess Krietemeyer, who you can't see on the screen, but is available by phone. "Is the program dedicated to new buildings or will you also be implementing projects for existing buildings?"

Bess Krietemeyer:

Hi. This is a quick test to make sure you can hear me by phone.

Eric Schiff:

We can hear you.

Bess Krietemeyer:

Great. It's a good question and I think it's when we get a lot with these different programs and I think it can apply to both, really. We've outlined some of the critical issues with existing building stock and that there's a lot of work to be done, particularly when we're looking at some of these low-to-moderate income communities and current residential buildings that are already out there. There's a lot to work with and quite a bit to consider for retrofitting applications. I don't think that has to eliminate the possibility for new construction, but even within the current building stock and the retrofit opportunities to incorporate these products or systems in a pretty highly integrated way, there's a lot of potential there.

Bess Krietemeyer:

And tapping into what Monica had opened up with in terms of this idea of intelligent buildings, there is a need to respond or have buildings be designed and engineered and optimized for varying weather conditions, of course, for dynamic grid demands and then people. And so thinking about the comfort, the health of the occupants and how they might, "Interact with these systems" or at least be occupying some of these systems, whether it be a kind of static retrofit system that gets installed on an existing

building or a kind of dynamic light and air purification system. I think there are a lot of interesting questions there to consider in terms of that occupant experience, as well. So I guess it can go both ways, but I think there's a really great strong push for existing buildings.

Eric Schiff:

Okay. Thank you, Bess. I'm going to pitch one question to Ed and then introduce Dr. Rogers, who's been able to join us now. This one is, "Will the EPIC program be funding and/or facilitating demonstration projects, especially for buildings with poor energy efficiency performance?"

Ed Bogucz:

The key part of that question was funding. We're very grateful for the support that comes from the Department of Energy, which we've had in our press release is \$750,000 over three years. And for our aspirations, this is a relatively modest amount of funding, which is going to get us going.

Ed Bogucz:

One of our commitments that we're making to companies that are going to partner is we're going to help them find other sources of funding. We have a lot of experience with doing demonstrations in the field and we've got a lot of great partners that can help with demonstrations. We've got modest funding that can help get started, but generally a full-scale demonstration of a new technology in an occupied building is a time-consuming process.

Ed Bogucz:

Happily, in New York State, NYSERDA has funding opportunities specifically with targeting demonstration. So one of the ways that we can help companies do a demonstration is to point them to sources of funding such as NYSERDA and showing them how one can secure the resources that you need to do a successful demonstration.

Eric Schiff:

All right. Thanks Ed. So I'd now like to introduce Juhanna Rogers, who's just joined us recently. She's presently the Vice President for Racial Equity and Social Impact at CenterState CEO. Her background includes a faculty appointment at Indiana University, consulting business and service as the Director of Health Programs at the Syracuse Model Neighborhood Facility. She will be leading our EPIC activities related to equity in the built environments. So Dr. J, you've been running successful workshops and trainings for companies in the region to help them better engage with our communities, all of them diverse communities, and to build more inclusive workforces. Could you describe these activities a little more fully and then address how we can encourage our EPIC GEB companies, the ones involved or partnering with this particular project, to discover innovations that would address the poor quality and energy inefficiency of buildings in many of our neighborhoods? And you may be muted.

Juhanna Rogers:

There we go. Thank you for that introduction. The question, you've got to tell me how much time I have because otherwise I could talk.

Eric Schiff:

Less than 20 minutes. Let's put it that way.

Juhanna Rogers:

I could talk for a long time. Welcome everyone. I'm excited to be a part of the esteemed panel. Pardon my late arrival, I was just finishing up with another client. But the work that I've been doing as vice president over the last year and some change with CenterState CEO has been really around creating spaces for business leaders to talk about what this recent, I would say, push towards diversity, equity and inclusion means for companies in various sectors.

Juhanna Rogers:

And I'm working with the number of them across various industries across Central New York and some, even across the country. And the conversation that we have most days is around, "Dr. J, we get it, but we just haven't had this conversation within this business sector in a way to answering the call from the larger community." The young folks that are showing up for interviews are now asking questions about, "What's our social responsibility?" Or, "What does our commitment to equity look like?"

Juhanna Rogers:

They're not just asking for an additional thousand dollars in their paycheck anymore, right? And we are not really sure how to move the needle on these things. What does it mean to be a company that's committed to equity? We put out a statement, but how do we move from that statement to key performance indicators or practical strategies that could lead to a more diverse workforce?

Juhanna Rogers:

Myself and my team, luckily, sit down on with leaders and their managers and talk about how do we get there? What is this new approach to DEI or this new push towards DEI demanding of us in this sector? And to be even more candid, often times it's a room of older white men, right, who may have great intentions, but they ... Dr. J we haven't had conversation. We're not opposed to it, but I don't know what to say. We have questions, but what if I say the wrong thing. Go, "Well, let's buckle up and get ready and talk through what might be the answers."

Juhanna Rogers:

And I must say, as an African American woman leading in this work, it's often exhausting. But over the last year and a half, despite some of the unfortunate incidents and really pain and strife we've been seeing happening across the country, folks are rolling up their sleeves and digging into this work in a way that I haven't quite seen.

Juhanna Rogers:

Today, I've worked with probably over three different organizations on various aspects of this topic. And what people are really finding is that finally, we have a space to talk about these things and we can ask questions. And that's what we really want to be able to help companies to do, right, to create the space, to begin the conversation.

Juhanna Rogers:

Because if we can begin the conversation and ask questions, we've never felt comfortable asking or maybe post statements and unpack why they're problematic or offensive or we can define what microaggressions means or what does white fragility or white privilege really mean? And what do you

mean by systemic issues related to race? And we can begin to unpack those things, agree to disagree even, but engage and dig a little bit deeper, then imagine the possible outcomes, right?

Juhanna Rogers:

Because I think in what we found is that people understand that folks come from different spaces and have different parts of their identity. What we haven't begun to really talk about is how those differences are defined, right? How they play out in certain types of settings and how it isn't necessarily the people on jobs every day, making decision to oppress or eliminate another being.

Juhanna Rogers:

But it's about the practices and policies that we haven't re-engineered or we haven't been really focused on reexamining because they've been working right. We can hire someone in a week and a half if we use this person. We have a method that can get us from point A to point B and we haven't had time to really examine how those methods may be reproducing the same outcomes, right?

Juhanna Rogers:

And that's really where we are. And so my work here with this talented group of folks is really going to permit the companies that are involved in this initiative to spend some time with my team going through experiences that help them really think about the problems plaguing specific communities that are populated with underrepresented individuals, thinking about design challenges or access challenges in those communities and how we can develop products or solutions to environmental matters in those communities if we're going into the design process with a deeper understanding about equity or inequity in specific communities or in regards to specific populations. And we're going to see what outcomes they come up with if we're starting with a more inclusive community in mind, rather than thinking about how to get products to a more inclusive community on the back end.

Eric Schiff:

Thanks. That's a great introduction. And I think all of us look forward to interacting with you through more with the project. All right. So thanks very much. I've picked up a few questions that we put aside for a moment, so let me choose one of them now. Yeah. So this one's good. "The Clean Tech Center does a great job with startup companies. Are there also opportunities in the project for more mature companies to receive assistance, too?" I think I will pitch that to Ed. There's a strike for you when your strikes on Ed.

Ed Bogucz:

As you pointed out, there's a lot of support for startups through the Clean Tech Center and we match that support or we seek to support existing companies develop new products and it's an important part of what we do. We help companies through analysis and design and then all the various elements that I mentioned earlier, IT landscape, ideation and new products, testing of prototypes and then when the time is right for field demonstrations, we can help help with the strategizing on approaching a field demonstration.

Eric Schiff:

All right. I have a ... Thank you, Ed. There's a question which I think I will toss it to Bing. "Would residential electric vehicle charging infrastructure be of interest, given the possibility of vehicle-to-grid-building and building grid-to-vehicle interaction? I can reread it if you need, but you probably got it.

Bing Dong:

Yeah, I got it. Yeah. Yeah. That's a great question. I think that definitely it's very interesting because EV [inaudible 00:42:39] and to the buildings itself is a very challenging problem for the grid, when to charge the EV, when to discharge the EV and how the behavior of the EV has a very complex dynamic impact on the grid. And in the study we did before, actually we did a study using the [inaudible 00:43:00] from Texas to find out the charge patterns of EV owners and obviously, the study issues that it has are 10-20% energy impact on the grid side, so if we can charge the EV more optimally. So yes, the short answer is yes. We are very interested in this technology. Yeah.

Eric Schiff:

Great. Let's see. I have to pick a panelist. I think we'll pick the hidden panelist. That's Bess. "How would indoor environmental quality play a role here? Would projects be for improving IEQ yet help create opportunities for modulating energy demands be applicable, demand-based heating, cooling and ventilation?" You can try to shift it to someone else if you like Bess, but why don't we start with you?

Bess Krietemeyer:

No, that's a great question. And thinking a lot about the different ... How do we define what a product is or what technology is in this opportunity? And as far as indoor environmental quality, I think that relates to many things. It relates to visual quality, thermal quality, air quality, all of these things.

Bess Krietemeyer:

And maybe kind of circling back to this question about retrofits and opportunities for incorporating low-tech or high-tech systems, I think there's a range that can start to address this complex challenge of indoor environmental quality to the point where we're designing some of these systems and products that can really accommodate or provide comfort and high-quality environments, living environments, even in some of these extreme or worst case scenarios, thinking about the word resilience and how even the way that we design these products for buildings, whether it's an envelope system, a kind of air purification system, how those also accommodate different scenarios, right? So kind of predictable weather conditions, but also maybe more extreme events.

Bess Krietemeyer:

So I think it's definitely important to think about the range of those scenarios when we're talking about the effects on that indoor environmental quality and the occupants themselves. And then I think that can be tied to the grid maybe in a little bit more of an indirect way, but it's certainly something to think about, especially when we talk, also, about storage and other technologies.

Eric Schiff:

Okay. Thanks Bess. Let's see. Mary Hubbard is on the line and she just sends a comment, which is, "Great to have you on the team, Juhanna." So that's a compliment, I think. Sarah, there is another question I'll pitch to you. Hold on. Anyway, I'm not actually sure exactly what it means, so I hope you can clarify. "Will innovative business models be evaluated as part of this program?"

Sarah Klee Hood:

That could mean a couple things I would think, but ultimately at the end of the day, what we're looking for, for acceptance into the program, is a product or a technology that has a defined market and an end

user. We're in the game here to get some solutions out there to solve some of these energy and environmental issues that we have laying before us. So as long as we're able to pin down the market and the end user, I think that's a good start forward and the innovation is up to your imagination.

Eric Schiff:

Okay. Yeah. Go ahead please, Ed.

Ed Bogucz:

I think there's lots of need and opportunity for rethinking who owns what and who pays for what, especially in low and moderate-income households. The idea of a high-performance, HVAC system that is energy efficient grid, interactive and healthy for the occupants. What the occupants want is a healthy, comfortable environment. They might if we have a business model that has the cost of that technology being owned by someone else and it's a profitable model, that would be a really great innovation.

Eric Schiff:

Okay. Maybe I will take this one. "We are also a startup called SunTegra, which is developing some solar projects, products that can be better integrated on the sides of buildings. Would that be of interest for this group?"

Eric Schiff:

Since that's something I've actually worked on personally a little bit, the short answer is probably. It needs to be energy hardware for buildings to qualify and depending on the details, that seems like something that would possibly fit. So probably I'd have to look at the full lead description and Bing's nodding his head, so I think I'm in good shape here.

Eric Schiff:

All right. I think that's probably about it for the questions and answers. Yeah. So Monica Neukomm sent apologies. She had to drop off. I think I've got all the questions managed now. So I'd like to take this opportunity to thank all the panelists and all of our listeners for a great hour's program. And we look forward to engaging with you as part of our EPIC project in the future. Farewell.