

NDRC: Building Resilient Energy Systems
Webinar Transcript
Thursday, July 30, 2015
3:00 – 4:30pm EST

[This webinar was attended by approximately 47 people. Not all attendants were present at the start of the webinar and others joined during the webinar. The teleconference system announced when an attendant joined the call. This is noted throughout the transcript as “Participant joined call.”]

Patrick Taylor: So to use the chat tool, there is a little graphic that we will show you on the next slide. You should see that on the right-hand corner, bottom right corner of your computer screen. You want to—

[Participant joined conference]

Patrick Taylor: You want to send your chat to everyone. You want to select everyone and that will get it out to everybody. If you want to send that at any time, you can do that. Again, we are going to hold those until the end of the call. Again, if you want to ask a question verbally at the end of the presentation, you must unmute your line using pound six and then when your question has been answered, please mute your line again and you will use star six to mute your line. All of the questions will be answered verbally. If you need a written response, please let us know. We may not be able to get to all of the questions. We will try to answer the common questions first. If you have other questions that you think of after you hang up or something goes unanswered, you can send those to ResilientRecovery@HUD.gov. Just a reminder, do not call in using that 415 number. That is a technical problem we are having. Call in using broad data at (888)767-9895. If everyone can remember to mute their phone using star six and unmute your phone using pound six, but only if you are asking a question. We are thanking CPD for making this webinar possible. Now, we are going to turn it over to HUD headquarters.

Allison Heck: Hi everyone, this is Allison Heck. We will kick off now the NDRC webinar, “Building Resilient Energy Systems.” Today, I will be speaking very briefly at the beginning. Then I will hand things over to my colleague from the Office of Economic Resilience, Crystal Bergemann. Then we will also be getting some great expertise.

[Participant joined conference]

Allison Heck: Some great expertise from the Clean Energy Group from Lewis Milford and Seth Mullendore. As people join, I am just going to remind you to hit star six to mute your line during the presentations.

[Participant joined conference]

Allison Heck: Today we are going to do a quick NDRC overview and timeline, as we do for every NDRC webinar. Then we are going to discuss the Renew 300 HUD Renewable Energy Target. Then we have some great tips from Building Resilient Energy Systems from the Clean Energy Group. Then we will be fielding questions at the end. As Patrick said in the beginning, you can put your questions in at any time through the chat function. However, we are limiting

questions specifically regarding this topic. We will not be answering NOFA specific questions in this webinar.

[Participant joined conference]

Allison Heck: Just to repeat, we are not answering questions specific to the NOFA in this webinar. Any questions specific to the NOFA need to be sent to RelientRecovery@HUD.gov. Then also, as he said, there is a different call in number for today's webinar. It is listed at the bottom of this slide. Again, please mute your line using star six.

The NDRC is the reason we have the webinar today.

[Participant joined conference]

Allison Heck: Sorry, the offices of the webinar. The NDRC, of course, is a billion dollar competition to communities that have been impacted by natural disasters between 2011 and 2013. This competition encourages communities to not only consider how they can recover from a past disaster, but how to avoid future disaster losses and to be more resilient, for instance in the area of energy, which is why we are here today. Also, the applicants are required to tie back their proposals to the disaster from which they are recovering. This is just a standard timeline that we show for each of the webinars. We are about three months away from when the phase two applications are due on October 27. We hope everyone is progressing well in their applications. We hope that you get some great ideas to incorporate into your application from this webinar. Now, I will be handing it over to Crystal to talk about HUD Renew 300.

Crystal Bergemann: Great, thanks so much Allison. My name is Crystal Bergemann. I am an energy analyst here at HUD and I work on a variety of energy topics, but my primary focus right now is our renewable energy target or Renew 300. I will be talking a little bit about HUD's interest and campaign around renewable energy. I will try to do so fairly briefly so that I can hand it over to our guest who will be talking more about storage and energy resilience, specifically solar plus storage and what are some of the new economics around that, and how some cities and organizations are making that work.

First, I want to talk a little bit about our target. Renew 300 is HUD's renewable energy target to get to 300 megawatts of renewable energy. In 2013, the President released a Climate Action Plan that included a 100 megawatt target. I just want to remind folks to mute their phones with the star six. In 2013, we had a goal of 100 megawatts of onsite renewable energy at our federally assisted housing stock. That is public housing, other types of multifamily housing. Sorry, folks, I will remind you to please mute their phone. If you are talking right now, please mute your phone. In the last two years, we have reached over 185 megawatts towards the 100-megawatt target in terms of commitments to renewable energy. Most of those commitments are in the form of solar energy. We decided to go bigger with our target since we have blown past the 100 megawatts. We are excited to turn this into a 300-megawatt target and not only are we going to be focused on HUD's onsite property and solar panels and other renewable energy on the rooftops of our properties, we are expanding the target. We are working with the Department of Energy and other organizations to expand to community solar and expand to a 300-megawatt target.

We know that not every building in America is suited for solar power. In fact, most families in this country, more than 50 percent, particularly when you are talking about low and moderate income households, do not live in a place where they can put solar panels on the roof either because they are renters or the space is too small. It may be located in a place that is too shady. For a variety of reasons, a lot of people cannot put their own solar panels on the roof. We think that community shared solar will help us reach more of those houses. Just since 2008, we have had a 4,000 percent increase in the number of shared solar projects. That number is expected to increase exponentially over the next four years as well. We think this is a great time to be focused on community and shared solar. As of April of this year, 172 megawatts of shared solar were connected to the grid. We are expecting between three and six gigawatts over the next several years. We are working with, as I said, the Department of Energy and other organizations to develop a community and shared solar partnership to complement our onsite solar goals.

This partnership will serve low and moderate income households in collaboration, as I said with the EPA and other representatives. The goal is to expand access to community and shared solar while utilizing technical expertise of the Energy Department and other national laboratories.

Next slide. The community and shared solar campaign will start with five working groups. The first one will be best practices at the state level. The second is federal and state resources. Third is on financing and business models. The fourth is on customer acquisition. The fifth will be around multifamily housing. These working groups are just getting started now. They will be formalized over the next month or so. If you would like to participate in the community solar working group, please feel free to contact solar@ee.doe.gov or renewables@hud.gov if you would like more information. The first one is the Department of Energy email. They are coordinating the working groups. The second one is our HUD internal email so if you have more of a HUD specific question, housing, and renewables question, you can send that my way at renewables@HUD.gov.

I just wanted to give folks a brief overview of some of the solar work and the community solar announcements and new projects that were started. Please feel free to ask questions about this at the end of the call or you can send them to me directly at renewables@HUD.gov. I want to make sure we have time for our guest presenters so I am going to hand it over now to Lew and Seth from the Clean Energy Group to talk about Resilient Power. Lew, take it away.

Lew Milford: Did not unmute, just unmuted myself. Sorry about that. Thanks very much and thanks Crystal and folks at HUD. What I am going to be doing is giving a brief introduction to our Resilient Power project, and then turn it over to Seth Mullendore, who is a project director here to talk in much more detail about some of the technology and the financing and the strategies that we are engaged in. Clean Energy Group is a national nonprofit. We work on the finance and technology and policy around clean energy and have been doing that for almost 20 years. We also manage a separate nonprofit called Clean Energy States Alliance with a lot of the state system benefits charge managers. This particular Resilient Power project is funded by a number of national foundations - JPB, and Surdna, and Kresge. We will describe what that is all about. This project is focused on increasing investment in clean Resilient Power systems. We will talk a lot about solar and storage because we think that that combination is the

opportunity that really can do a significant amount of good in cases of providing better resilient power over time. We are engaging city officials around the country to look at actual investments in projects going beyond planning to really do projects. We also have a particular focus on low income and vulnerable communities and affordable housing. As Seth will describe, we are beginning to work with a number of affordable housing developers and other companies to help install solar and storage facilities in critical buildings. Advocating for policy. We also have small technical assistance fund where we are supporting predevelopment costs to figure out some of the technical and financial issues involved in installing these technologies. You will see a number of reports that we have written a bunch of stuff over the last 18 months or so.

You are all familiar with Sandy and the power problems. I will zip through this. The main point I think and we emphasized this again, is that we had obviously horrendous power failures during that time. The word was that somewhere in the neighborhood of 60 percent of the diesel generators during that time failed. We have a real gap between what the problems are and the solutions at the time. We need to change that system so that we can ride these power outages out in a safe way. This is only going to get worse. Most of the predictions are with climate change, with severe weather coming upon us that the risk of power outages is growing over time. You are going to see this increasingly in some of the major cities in America. We have a lot of other people doing some reports that are coming out in the fall that underscores this connection between climate, sea level rise, and risk to the power system.

In a particular, the harm to vulnerable low-income communities is clear. This is work that has been done by many other organizations to confirm that the impacts on low-income households were significant from power outages, heat waves, drought, and the like. The Sandy statistics are very dramatic. What you saw in most of these places like housing projects, low-income buildings, senior centers is that they were virtually no power at all. Either no backup generators were there or the generators that were there failed. That is the problem with the system we have now is that the diesel generators basically sit there and wait to fail. We can do better than that.

What you really have, we think, is kind of a clean energy divide, a resilient power inequality. When it comes to some of the new technologies that we are going to talk about, it is really a disparity between those who have and those who have not. It is not unusual, but in this case it is in spades. In particular, what we are seeing now is a trend around solar and storage technologies that is a significant market trend. Obviously, if you saw Tesla's announcement you are seeing activity around four cities. You are seeing bank analysis of where this technology is going. These markets are taking off significantly. Where they are taking off, and we will get into this a little bit later, principally are in private markets. Most of these technologies that the solar and storage technologies are being used for utility build reduction, demand charge reduction. Our view is that these technology combinations can be used for much more and to serve people in need that these technologies can be used to help ride out power outages where you have batteries being charged by solar. You can, at the same as they are working to do that, potentially reduce utility bills by reducing demand charges and also they are sources of revenue generation as well. There is a tremendous amount that can be done in this space. Let me turn this over to Seth, who will get into much more detail around the way the technology works and some other aspects of the project. Thanks.

Seth Mullendore: Thanks, Lew. As Lew said, we are focusing mainly on solar and storage. That does not mean just solar and storage projects. We are also working on CHP, micro CHP to pick up some of the loads that are not as well as suited for battery loads. They could even be used to help increase the duration and the performance of existing generators, backup generators, if those are already installed. I just wanted to briefly show you what the technology schematic looks like.

Basically, you have a solar system, standalone system. If you took away the energy storage and the critical load subpanel at the bottom, the inverter would be a grid-tied inverter. That is problem. Mostly systems are tied to the grid and due to safety regulations and concerns, they go offline when outages occur. With energy storage, you can put in this dual inverter that works with the solar array and the battery. Then route some of the loads through a critical load subpanel. Buildings do not tend to put all of their loads as supported through solar and storage because it is not generally feasible at this time due to different kinds of concerns, partially financial, partially space. It tends to be more suited for the critical load that you need to weather through an outage, which is PDM control, accessibility, and mobility for people living in the unit, lighting, communications, and things of that nature. We are working with a lot of people on these projects in addition to working with developers. We are also working with a number of cities on getting together a disaster preparedness plan and helping them focus on their power needs. So far, cities are not really looking at what it takes to have resilient power and have not developed a citywide power strategy for resilient power. We are working with Baltimore, which this report is from a study we did with Baltimore. We are also talking to other cities including one of the NDRC groups in Duluth about how to look at more of a citywide plan and incorporate solar and storage into the planning.

The first thing to do is to identify what buildings might be well suited for that. They could be community shelters or fire stations, police stations, assisted living facilities, affordable housing, things of that nature. Then looking at what it takes to finance these. In some cases depending on where you are, market conditions really can help pay for the systems. I will go into that a little bit more later on.

We are also working with states on these as well, and recently we put out a report talking about what some of the states have done and some of the best practices and policy recommendations for states looking to fund resilient power projects and get more projects going in their state. Most of the action in funding these projects has been in the northeast due to Sandy. We have seen over four million dollars in new managed funds targeted towards resiliency. Almost 100 critical facilities now have been identified and are in development for solar and storage projects to help in power outages and provide resilient power. The trend has been moving away from these funding and incentives towards more market based solutions. Financing still remains a significant problem for some of these projects. A lot of state and local support has been going towards this to get things up and running and fill in the holes where markets do not exist. Ultimately, the goal is to make this a more market-based approach. The cost of storage systems are coming down significantly as solar has throughout the past decade. We are still in somewhat the demonstration phase as far as resilient power projects go. We have to look to other value streams for financing projects because resiliency does not tend to have market value that people put a number on. Again, just another closer

look at the public support for solar and storage. This is again, mainly focusing on the northeast. As I talked about before, Connecticut, New Jersey, Massachusetts, New York, they have all devoted a significant amount of funding towards resilient projects. New Jersey has the resilience bank going. New Jersey, Massachusetts, Connecticut, they have all had either micro grid or resiliency RFPs that they have put out for projects to help fund these. Vermont also has a big solar and storage micro grid that is supporting an emergency shelter at a nearby high school.

In addition to this public funding, there is starting to be more of an economic market case for solar and storage. Unfortunately, this is only the case in certain regions at the moment. One of these big ones is the PJM Interconnection Territory, which is throughout much of the Mid-Atlantic States. They have set up their ancillary services market, which is a grid services market for frequency regulation in a way that storage can participate in the market. Even more importantly, small storage systems, the kind that you would find in individual buildings can be aggregated together to participate in the market. Now, solar and storage projects that are involved in this frequency regulation market, participating in it, they can have short payback periods, as little as four years or even less. The outcome is that you can have these resilient systems tied in with islanding capability and critical loads connected in at no extra cost, basically. It is paid for by participation in these preferred markets, the frequency regulation markets.

An additional way is through demand charge reduction. Any building that faces commercial rates and increasingly, we are looking at residential rates maybe starting to adopt demand charges, there is a charge for the peak amount of energy that is demanded from a facility throughout a billing period. If there is a spike in demand, then the demand charges are based on that spike. This is particularly an issue in California and New York, like New York City where they are seeing very high peak demand charges of 30 to 40 dollars per kilowatt. We also, as we talk to areas, are seeing this more and more. We are talking to people in Colorado and parts of the Midwest that they are seeing half of their bill is demand charges. Unlike just solar alone and efficiency measures, energy storage can help attack and reduce these demand charges instead of just reducing the kilowatt-hours, the consumption over time.

We are involved in a number of resilient power projects right now in development at different stages. As Lew mentioned, through our foundation support, we offer some technical assistance funding to help scope out the initial projects and the feasibility and financial side of solar and storage projects for resiliency. One of the things we are doing is we are looking to demonstrate the viability of these projects for affordable housing and assisted living. We are working with a number of developers in New York City, Chicago, D.C., Newark, and Boulder. We have one project in New York called Via Verde and it is going to be going into place and fully operational we think by the end of the year. That is a solar and storage unit system that is combined with a small CHP combined heat power and micro CHP. That is providing all of the critical loads back up for that building. The solar and storage is helping support water pumps so that residents on higher floors can have access to clean, running water when the power is out.

We are also working with a number of cities on supporting critical facilities. We are active in a number of areas, not just in the Northeast, but across the U.S. These are projects in community

shelters and fire stations, hospitals, wastewater treatment, anything that is critical to communities to keep up and running when power outages occur.

That is basically it that I have. We have done a bunch of writing on these topics and webinars like these. We would be happy to talk with anyone that is interested in pursuing solar and storage as an opportunity to provide more resilient power. I know a lot of cities do not consider resiliency in their power system as far as what to do when the lights go out. Residents need access to just even the basics of communication and lighting sometimes. These are systems that are available that can provide those services. Please feel free to reach out to us. We would be happy to hear from you. I will pass this back to our moderators and open it up to some questions. Thank you.

Patrick Taylor: Thank you, so we are able to ask questions now. I just want to remind you, you can ask a question using the chat tool in the WebEx panel. Just send that to everyone. You can also ask a question verbally. To do that, you would need to unmute your phone using pound six. We'll let folks think of questions. If you do ask a question verbally or through the chat, please state your name because we will have this transcribed so that the transcriber will be able to track down who you are.

TJ Winfield: Amy Schneider had a question about locating some charts. Amy, if you are able to come off mute and ask the HUD staff if you know which specific charts you are looking for, you can go ahead. Amy Schneider, are you still on? I guess not. If you have a more specific question, you can go ahead and type that in and I then I will read that out loud.

I will go ahead and move on to Julian who has a question. He asks what sorts of financial incentives exist for retrofitting existing PV systems with storage, especially when doing so requires configurations different from the ones shown in the slides?

Seth Mullendore: Well, this is Seth. The incentives depend on where you are. Like in California, they have a self-generation incentive program that can help with that. Different areas have different programs. New York is also doing some incentive programs. Yes, the configuration for retrofitting a system often looks different from the one that I showed up there. Basically, what I showed was the solar going directly through an inverter to the energy storage and they both work in DC. However, you can have a two-inverter system where you still have the grids on inverter and all of technologies that you would normally have with a regular solar system. Then you have an additional inverter that goes from that system into the energy storage, the battery storage, and the critical loads. It is basically the same sort of thing, but with two inverters, which can be a bit more costly for the full project, but as far as the retrofit, it is better to keep your existing wiring that you already have in place for the solar system and just add these few components that you need for the energy storage system. You cannot take advantage of the ITC in that case if they are not installed at the same time, but you can still take advantage of the depreciation, the accelerated depreciation over time. You still can take advantage of that.

Crystal Bergemann: Hi, this is Crystal with HUD and I just wanted to add to that. You said that if they are not installed at the same time, you cannot take advantage of the ITC. I just wanted to make sure that that is clear that if they are installed at the same time, if you do install

storage with your solar system at the same time, then you can take advantage of ITC for the entire project. If you are thinking about and that is the tax credit, 30 percent tax credit that helps finance a lot of these projects. If you are thinking maybe I will just do solar now and then add storage later, it really behooves you financially to think about it all at once.

Lew Milford: Thank you, Crystal. This is Lew as well. I think what you folks have just described is exactly right. There are some folks out there who think that it is possible to add storage to an existing solar system and somehow maybe perhaps take advantage of the ITC. We have not seen clarity around that. We are a little skeptical of that position. If anyone else out there has heard that or is taking that position, we would like to know. We want to really get to the bottom of it. Our view, as you described it, as Seth said, that it is quite clear that if they are in together up front, new, then the ITC should be available for both and otherwise not. Again, there are some folks that seem to think they can stretch that a little bit, but we are not quite clear on that yet.

TJ Winfield: I will move on to the next question. This one is from Khalil. They ask what, if any, is the cost differential in clean energy and storage for affordable housing when considering multifamily versus single-family housing units?

Seth Mullendore: The big difference that we are seeing is that the multifamily housing for common areas and loads, basically the commercial rates for utility bills. They have the demand charge component, which like I said in areas where demand charges are a significant amount of the bill, energy storage can provide an economic savings through reducing those demand charges. For a single family home, they most likely will not have a demand charge component. That may not always be the case if it is owned by a commercial entity. Yes, that is really the main difference. Of course, the size of the unit and the loads that would be on the unit, the loads that would be supported are much different between the two kinds of buildings. For a multifamily, sometimes you can just put critical loads in a common area. You have lighting and some outlets where people can charge phones. You have a cool room that residents can use if you have residents that are subject to problems with heat. Whereas in a single family, you tend to have to support more widely just for family that lives there these loads.

Lew Milford: Just to add to that, on the question of the economics of doing these projects in affordable housing, we are working on several projects, as Seth said, around the country. We are in the middle of doing a paper on this topic probably to be released in September. It will look at three different buildings in New York City, D.C., and Chicago, looking at real buildings that will not be named. We will tease out the economics so that people will have a sense of how if solar and storage is installed, perhaps with a small CHP, here is what the numbers will look like. Here is what the savings could be using either demand charges and/or frequency regulation revenue, and here is what the payback looks like for a typically sized system. Hold on. We should have this in pretty good shape we hope by September. It should advance the conversation a bit about what the real numbers look like.

TJ Winfield: Okay, moving on, Michael asks apart from Via Verde, what experience have you had with other affordable housing projects in solar and storage? What were the economics of the Via Verde project?

Lew Milford: That is again, I think the answer will come in this paper. We are in the middle of doing that now. So we are working. You may be familiar with Bright Power, which is essentially like a public purpose ESCO. They are involved in doing the technical and financial work on the Via Verde project, as well as some of the other projects I mentioned. There is a fellow there named Henry Misas if you are interested in looking more deeply, perhaps, with an outside consulting firm that is doing this work. We will have those numbers in pretty good shape in six weeks or eight weeks.

Seth Mullendore: This is Seth, just as a brief sneak peek into the results that we found, so far in the products that we have scoped, again, these are in areas where they are facing higher demand charges than maybe in some areas or it is within the PJM where they can participate in the frequency regulation, the economics looks pretty good. These systems do pay for themselves over the expected lifetime of the system.

TJ Winfield: Moving to the next one, John asks, is there some classification or rule determining how much storage is needed or what size of storage is being used to provide power for how long to be considered resilient?

Lew Milford: Do you want to take that, Seth?

Seth Mullendore: Sure, that is a good question. Basically, it is up to a bit of interpretation. That is one of the issues we have seen in some of the RFPs that have been put out there, the solicitations by the states. New Jersey has had some projects that have provided two hours of backup power for a resiliency grant. That is definitely debatable whether that could be considered resilient or not. It is up to the facilities or up to whoever is going to be impacted by outages to determine what level of resilience and how long for what loads is considered a good thing. How much are you looking for and what are you looking to do with it? The size of the system and how you use it is going to really depend on those variables. That is really one of the first things you need to look at in one of these projects is saying okay what loads do I want to have supported and how long do I think I am going to need them? With solar, you can get the benefit that you will support some of those loads when it is sunny out. Then the battery can be charged if the loads do not take up all of the solar power. But, if it is not sunny out, then you are just depending on the batteries themselves. There are a lot of considerations to be made in these and it depends from project to project.

Lew Milford: There are two things I would add to that. We have a paper in the works looking at that issue because it comes up all the time. It is a design question, building by building and what the customer's needs and wants are. We are going to hope to do some kind of an optimization paper to give an indication of what is possible to do with different technology configurations. That is one thing. I think the second thing is and I think is implicit in the question is, are there standards or rules on this? There are not. Obviously, people are familiar with fire code standards for when diesel generators are supposed to kick in, but we really do not have, any that we are familiar with, that really get to this question. We think as the technology matures and we get more experience with how these operate, then chances are we will get into a world and I think we should, that may be more standardized and that starts to require more than the basic fire safety code provisions of diesels, which clearly are

inadequate. Also, maybe policies down the road that introduce more technology innovation. One of the major problems we have seen is, again, with the diesel situation is that when there is a requirement for diesel backup—

[Participant joined conference]

Lew Milford: --that the requirement for diesel basically becomes the ceiling. Compliance with code becomes as much as building owners do or want to do or plan to do. I might argue that is insufficient has proven insufficient. We are looking at ways to try to introduce some innovation into the space. We think, again, with the technologies that are coming online like solar storage, we are seeing this activity now in private commercial establishments. There are hundreds of these now, mainly in California, for demand reduction, not necessarily configured to be offline. As we see more of them, we think that it might then open up the opportunity have a better regulatory response.

TJ Winfield: Sonia asks if an eligible applicant leverages the Clean Energy Group as a resource for the NDRC, will HUD consider that relationship development with regards to the competition?

Allison Heck: They need to submit that question to resilientrecovery@HUD.gov. Then we can provide them an answer through that mechanism. We will provide clarification through that.

TJ Winfield: Laura then asks what approaches work with utilities to convince them that islanding capability is safe and preferable to solely grid connected systems?

Seth Mullendore: This is Seth. That is again a very good question. That is a difficult issue. I mean, the fact is that some utilities are very hesitant to bring much storage into their territories for a number of reasons. Partially, it is they just do not want to have to deal with the new technology. The best way, I think, to approach that in my opinion is to point to a projects that already do exist, and look at the number of valuable grid services that energy storage can, if properly utilized, provides for utilities such as demand response, like I mentioned earlier, frequency regulation and even providing additional capacity to meet peak loads. There are a number of values to energy storage that utilities, I think, should embrace, but some of them are more hesitant to than others. Lew, do you have anything?

Lew Milford: Yeah, I think two things. It is a very good question. Obviously, there are no good answers on this. You are going to have debate on this for years to come as the technologies get introduced into the marketplace. You are beginning to see some tentative answers being provided by regulators like in New York that are doing the rev process, trying to figure out how distributed generation fits into the system. Among those questions they are addressing are what is the role of utilities with respect to storage? Should they be permitted to own storage, for example, and should they be permitted to own distributed generation generally? The answer of New York so far is that, you except in limited circumstances, that is utilities should not be permitted to own the storage unless in limited circumstances which may be relevant to you folks that it maybe come to where there are public purpose needs in low income housing, affordable housing. New York seems to be one wanting to make an exception for utility ownership in that space. You will see variations of that in deregulated markets like New York. In regulated markets like here in Vermont and in other places where you still have

vertically integrated monopolies, I think you will start seeing the same as here - utilities interested in that ownership capacity and being able to regulate, to install storage in the facilities so they can, as Seth is saying, utilize that much like they do with water heater programs, to stabilize the grid and save money for their investments in the larger grid over time. Tune in. This is going to be sort of a fascinating change because storage, when you combine it with solar, opens up a lot of opportunities and a lot of challenges for both market players, as well as utilities. Rocky Mountain Institute and others have done some very good work around grid defection and the challenges that this is going to present to utilities. This is the middle of the beginning of another phase in how clean energy is going to play itself out in the marketplace.

TJ Winfield: Tonia asks, has anyone at Clean Energy Group considered projects here in Alaska? The economics are sure to pan out with micro grids supporting villages are easily paying six dollars a gallon for diesel.

Lew Milford: Yes, for sure. This is Lew. We run the Clean Energy States Alliance and have Alaska Energy Authority as our member. I think folks here are talking to some folks in Alaska over storage projects. So I think the answer is yes.

TJ Winfield: Julian asks again, could we possibly get more details on how to access the paper that was mentioned, the one about assessing buildings in New York City, D.C., and Chicago come September?

Lew Milford: Sure, we will try to very broadly release this, and I think probably with Crystal and through HUD as well once we get this done. We hope we can reach out to as many people as possible. We will hope to do that for sure.

Seth Mullendore: This is Seth. Also, any of the reports that we put out will be fully free and available through our website, <http://www.cleanegroup.org> , and <http://www.resilient-power.org> .

TJ Winfield: And Tonia asks what sort of storage solutions does Clean Energy Group have experience with?

Seth Mullendore: This is Seth. So far, we have mainly been working with developers that use lithium-ion batteries, but we are technology agnostic. In fact, we are actually closely involved with the project in Vermont, the micro grid that I mentioned with solar and storage. That one is a hybrid system that is solar with both lithium-ion and advanced lead acid batteries installed for different purposes. We are technology agnostic. We work with developers and are happy to work with any developers that are using technologies that they think will work. We are obviously more hesitant to work with the new technologies that have not been fully tested yet. We think lithium-ion is in the category of well tested that has been used for years in different aspects and more and more for these stationary energy storage projects.

TJ Winfield: That is all the questions that I have received so far. If anyone else has any more, feel free to type them into the chat box or ask them over the phone.

Lew Milford: Hey, Patrick, this is Lew. One thing I wanted to mention going back to Crystal's point about community solar, the questions have come up about storage and whether storage can be partnered, paired with the community solar installation. We are just beginning to look at that. A lot of issues that have come up in all of these areas. We are going to take a look. We think that it can. I believe that there is one project. We just sent someone around and it has been done in Minnesota that actually pairs up a community solar structure with storage. I do not think we see any major obstacles to this, but it is not uncomplicated. I think we are going to be doing a paper on this really soon to kind of lay out some of the options. I do not know, Seth, if you want to add any more to that point.

Seth Mullendore: No, not really. The Minnesota project is using storage with the community solar just for a value proposition. It is doing a time shift. It shifts energy that peaks during the day through solar production around noon and shifts it towards the evening hours like 5:30 to 7:30 when the demand peaks for energy on the whole system. It is shifting energy from one time to another time because the energy is more valuable to the system at that point. So it is adding value to the community solar project as a whole. It is actually adding value to the utility. The utility is the one that is doing this project. We see both the prospect of adding value to community solar just through the benefits that energy storage can add plus if the community solar project is located in a site that is near enough to a critical facility or a vulnerable facility such as affordable housing, the storage can be used and tied into those systems. We see a great opportunity to be able to provide this resiliency through the community solar. You'll have a big solar project and probably a fairly large battery attached to it that is already making its money through the community solar project, and then to be able to provide this additional resiliency benefit to a nearby facility just kind of as a bonus to the project.

TJ Winfield: I will just remind everyone one last time if you have any outstanding questions, you can go ahead and type them in the chat box or ask them through your phone.

Patrick Taylor: We will wait another minute or two for people to think of last minute questions.

Lew Milford: This is Lew, as you are waiting. One other aspect of this as financing has come up and we are spending a lot of time focusing on financing. Our thinking on this is that given the early stage of this market for affordable housing developers, it would be helpful to have some kind of financing facility, perhaps a credit facility, that could provide soft capital, lower cost capital to help developers get these projects installed. We are beginning to talk to a number of developers, a bank or two, and others, particularly Green Banks in the Northeast about ways to increase the financing capacity for this space. That is another thing we know is an issue and we are trying to figure out what some of the good answers might be.

TJ Winfield: We do have a couple more questions that have come in so far. Robin is asking four of the ten most vulnerable cities are in Florida. Any demonstration projects there?

Seth Mullendore: We do not have any.

Lewis Milford: Not yet.

Seth Mullendore: This is Seth. We do not have any projects there. They do have a huge program there called the Florida, I forget exactly the name, Florida Smart Shelter or something in that respect that is solar and storage at over 100 schools now that the schools act as emergency shelters in a storm. They have a huge project that is going for solar and storage throughout their schools.

Lew Milford: Yes, that is a good program. We have touted it as something that other states should look at and possibly replicate.

TJ Winfield: Teddy has a question for Crystal, which email address should we contact in regard to the community shared program national workshop?

Crystal Bergemann: You can contact either of the ones that were on the slide, but probably easiest and fastest to just email renewables@HUD.gov.

TJ Winfield: Crystal, if you could just type that into the chat box and send it to everyone. I think that would be a good way to have it written out.

Crystal Bergemann: Okay, will do.

TJ Winfield: Thank you. That is it for questions that I have received.

Allison Heck: Thanks, so this is Allison again. I think that we have gotten to all of the questions. I thank the Clean Energy Group again for providing some expertise on this topic and for Crystal for joining us. I want to remind everyone that next week we also have another topical webinar. It will be approaches to infrastructure financing. We have some really great people who have been involved with the Build America initiative who will be speaking on the webinar next week so please stay tuned for that. In the meantime, again, if you have questions regarding NOFA specific questions regarding the NDRC, please send them to resilientrecovery@HUD.gov. Thank you for joining us today. I will end it there.

[The webinar ended. End of audio.]