DOE Resources for Resilience of Critical Electric Infrastructure

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It's 2:00 p.m. Let's get started. Welcome to the joint webinar with the DOE office of electricity and the office of cybersecurity, security and response. The DOE is holding webinar in conjunction with the HUD office of community planning and development and in particular, the division of disaster recovery and special issues. Today's webinar is part of the 2020 CDBG-MIT webinar series and

I'd like to point out that today's webinar will be recorded. That recording, the slides and the transcript, will be posted to the HUD exchange at a later date. Anyone who hasn't muted their line, please do so now. Also, I'd like to point out that the participants will be in a listen mode only. Please submit your content related questions through the Q&A box and you should see that on the right side of your screen. Please submit your technical related questions also via the Q& A box and we will monitor those questions, particularly the content related questions and our presenters will look at those and we will address the questions at the end of today's presentation. Your technical related questions, if there are issues with the webinar and you need assistance, the hosts will monitor the Q&A box and respond to you directly. With that, I'd like to thank Ms. Jo-Shani Clemmons with everything she's done to support us with the CDBG-MIT webinar series. Thank you so much, Jo-Shani. Would you like to talk about the survey?

You are welcome and thank you, Roosevelt. Hello everyone and good afternoon. What Roosevelt was informing you of was a level one survey in the box entitled click to eat eval. It will direct you to survey to complete it. If not, I will send you the link after this event and through tomorrow. And a few housekeeping things, to get a copy of the presentation today, you will click on that PDF and the box and collided file to download and you will click on it and the system will walk you through either printing it out or saving it or even just following along with us. I think that is everything, Roosevelt. Have a great meeting and thank you.

Thank you again, Jo-Shani. Today's webinar is titled, energy infrastructure resilience and mitigation. I'd like to point out that this is our third webinar and our first was May 21 with the office of energy efficiency speaking broadly about energy efficiency and renewable energy best practices. Last Thursday we had the building technology office and the DOE come to speak with us with respect to the energy efficiency and resilience in buildings and also, they talked about model codes and resilient building standards. So, very helpful information presented through DOE. Again, our office of electricity and DOE and then the cybersecurity, the energy security and emergency response office will be presenting a joint webinar today with HUD entitled energy infrastructure, resilience and mitigation. I'd like to introduce our presenters today. First, we have missed Brandi Martin with the US Department of Energy office of cybersecurity, energy security and emergency response. She focuses on energy security planning and emergency preparedness with state, local, tribal and territorial governments. Prior to joining the

Department in 2016, she served as the partner engagement director at the smart cities Council and the industry-leading technology partners and engaging city government leaders. She also has seven years of experience in various roles at Cisco Systems. Thank you for joining us today. Next, we have missed Johanna Zetterberg, with the US Department of Energy office of electricity and she is an energy sector professional with over 10 years of experience at the US Department of Energy, working with states and local governments on evolving energy priorities. In the office of electricity, she leads efforts to protect national security and defense activities against energy sector threats. One of our guest speakers is Ms. Kenya Stump and she is with the Commonwealth of Kentucky office of energy policy and she is the Executive Director of the Kentucky office of energy policy, which utilizes Kentucky's energy resources for the betterment of the Commonwealth while protecting and improving the environment. The office addresses energy policies with a commonsense approach that ensures that the Commonwealth thrives amid rapid changes occurring in the production, the delivery and the use of energy. Thank you for joining us today.

We also have the assistant director of policy, miss Jennifer Carpenter and her 12 years at HUD, she's worked on various programs in CPD, including six years with the team responsible for managing the neighborhood stabilization program. Thank you, Jen, for joining us. My name is Roosevelt Grant and I'm with the US Department of Homeland Security Federal Emergency Management Agency and I'm completing a rotational assignment to Jen's policy team and with that, I'd like to move forward with our agenda. Here is an overview of today's webinar presentation. First, we will have a discussion on background for CDBG-MIT purpose and goals and we will ask the question, why focus on energy? Our speakers from DOE and the Commonwealth of Kentucky will address the office of electricity and cybersecurity and emergency response introductions. We will have some project examples. Ms. Kenya Stump will talk about the Kentucky state office of energy. We will wrap things up with a quick summary, provide you with some resources and then have a Q&A session at the end of today's webinar. With that, I'd like to turn it over to Jen.

Thank you, Roosevelt and thanks, everyone, for joining us today. I am just going to give you a brief background on CDBG mitigations, CDBG -MIT for short and we've been doing this to give context just in case you are not a grantee that currently has mitigation funding. We want to make sure everyone is on the same page on the funding and the purpose of the funding and some of the goals. So, the mitigation grant, CDBG-MIT, is the unique funding source where there is a focus on carrying out strategic and high-impact activities and to mitigate disaster risk and reduce future losses. First, all of the activities funded by CDBG-MIT must meet the definition of mitigation. Mitigation is defined in our Federal Register notice as activities that increase resilience to disasters and reduce or eliminate the long-term risk of loss of life, injury, damage to and loss of property and suffering and hardship by lessening the impact to future disasters. In your mitigation needs assessment, part of your action plan for these funds, you will identify both current and future risks and your most impacted and distressed areas per those areas are defined by HUD in the Federal Register notice and in the state or local

government where the grantee defines their own most impacted and distressed areas. Third, it must be CDBG eligible. For this in the Federal Register notice, all of the activities must meet the national of objective. It includes, for this notice, benefiting low and moderate income persons, with an additional new national objective we've added to the mitigation grant that is called urgent need mitigation and there are additional requirements in the Federal Register notice associated with that national objective and also, the mitigation and national objective for covered projects. Both of those are new for mitigation and there are additional requirements that aren't normally in the program. We want to make sure you check the notice for those requirements. To maximize the impact of the funds, there are a few goals that HUD has named in the Federal Register notice that we want to go over and try to keep remembering as we walk through this presentation today. Really, as you've put together through the grantee is, for the action plans during the process of doing that, just keep remembering these goals that HUD identified in the Federal Register notice. We'd like our grantees to rely on data-informed investments, build capacity to analyze and address disaster risk and as well, updated the hazard mitigation plans for their jurisdictions and supporting the adoption of policies that reflect both your local and regional priorities to have a long-lasting effect in risk reduction and maximizing the impact of funds by encouraging leveraging and public-private partnerships. In order to do this, grantees are strongly encouraged to coordinate and align your CDBG mitigation projects with other Federal and state local mitigation projects. This webinar focuses on how you can align some of this work within the DOE sphere and we will talk about the different kinds of projects and hearing some best practices in that arena. This notice also continually -- the notice for mitigation -- continually puts notice on shared goals and mitigation to advance long-term resilience to current and future hazards, align the funds, as we mentioned previously, and promote planning efforts. These are all things you want to consider for those grantees that are still in the development phase of putting together their action plan. We've pulled some things from the notice specific to the energy lifeline and for those of you familiar with the notice, you know that as part of the mitigation needs assessment, you really need to identify those needs through those community lifelines, as they are defined in the notice. One of those is through energy. It's energy, power and fuel. We've taken those references and put them here so you can tie the things we are talking about today back to the notice, back to your requirements and back to what needs to be in your action plan and the things you need to be thinking about. You can read these. The mitigation needs assessment, one of the requirements is that you have to quantitatively assess the significant potential impact and risk of hazards affecting those community lifelines that I mentioned. One of those being energy, power and fuel. Energy efficiency infrastructure is one of the things we mention. The typical infrastructure mitigation programs may include regional investments in risk reduction for all hazards to develop disaster resistant infrastructure, including energy infrastructure to address specific and identified risks. So, for your mitigation needs assessment, you identify your risk and when you pick your programs and projects, you are then linking those programs or projects to the risks that you've identified in your mitigation needs assessment. We are always going back to that analysis we did at the beginning, to link your programs and projects back

to that. In this case, if you have these types of projects, you are linking them back to the needs you've identified in the lifeline related to energy. For covered projects, we have a covered project definition in the mitigation notice that revolves around these types of infrastructure projects and this includes infrastructure projects as defined as an activity or group of related activities that develop the physical aspects designed to provide or support services to the general public in the following tech servers, including energy production in generation and from possible, renewable, nuclear and hydro resources and electricity transmission. So, there is a much longer definition in the Federal Register notice about the covered projects, but this section applies to these types of projects we will talk about today. With a covered project, it also comes with a dollar threshold. Once your project reaches that threshold, there are additional requirements in the notice that you have to meet and respond to HUD and submit those through a substantial action plan amendment and the HUD will that approve that and will review and approve based on the review of the substantial plan amendment. And one last lie to talk about some things in the CDBG-MIT notice. This is perhaps the elephant in the room, and we want to acknowledge that we have a prohibition on assistance for private utilities. For the last few years, we've had this prohibition in our Federal Register notices. Funds made available under this notice -- and we are talking about CDBG-MIT -- they may not be used to assist privately owned utilities. However, a CDBG-MIT grantee that prioritizes the mitigation project for assistance to a privately owned utility is necessary, may request a waiver of this prohibition. In the CDBG-MIT notice, we specifically allow grantees to come in and request a waiver and if you've identified those risks and your mitigation needs assessment. You would have a project to mitigate those risks to reduce disaster loss, then come in with that justification and explain the project to HUD and ask for a waiver and we can go from there. You will always -- when you have a waiver request -- reach out to your CDBG grant manager, whoever that is and make sure you have conversations with them early on in your planning process if you think you need any type of waiver. You want to make those connections early and have a conversation about the justification or good cause that HUD is looking for in your request. Make sure you are working through your grant manager, in that case. I believe I am turning it over to Johanna.

Thank you.

Actually, Brandi is going to start us off. Go ahead, Brandi.

I'm Brandi from the energy security and emergency response office, also known as CESER and we have the best acronym within DOE, I think. Johanna and I are happy to be here and to have the opportunity to speak with all of you today. I wanted to talk about the significance of energy. Energy is essential and it powers and fuels our lives and the economy. Many of the basic necessities, the things we rely on, they all require energy. A disruption or physical or cyber-attack on energy infrastructure could affect other critical infrastructures such as hospitals, water, transportation, emergency services and government operations. During the COVID-19 response, we likely saw the Department of Homeland Security lift the essential critical infrastructure workers and this shows the identified critical infrastructure sectors that DHS has identified. It's

not at a worker level, it's at a sector level and shows the interdependencies across the different sectors. There are four designated lifeline functions and they are all in red with energy, transportation, water, communications. These lifeline functions are so vital that a disruption or loss of the function will directly affect the security and resilience within and across all critical infrastructure sectors. Specifically for energy, energy provides essential fuel to all of the critical infrastructure sectors and without energy, none of them can operate properly. When talking with the energy sector, we want to be clear about what it encompasses and obviously, electricity is what people think of first. It's from natural and renewable sources and also, natural gas and liquid fuel like gasoline, jet fuel, propane and heating oil. That is what the sector includes in the infrastructure, itself, is the assets, the equipment, the systems and the facilities and networks and other elements that you see here. Not surprising that the reason we are here today is that our energy infrastructure and system are vulnerable to a variety of hazards including severe weather, hurricanes, flooding, tornadoes, earthquakes and wildfires and also infrastructure failures and pandemics and deliberate attacks and other events. DOE uses and recommends an all hazards approach including cybersecurity. States can work with energy providers and stakeholders to reduce the risk and vulnerabilities to the energy infrastructure.

Thanks, Brandi. That was a great introduction and I will continue the presentation for a few minutes. We wanted to provide a little bit of background on the two DOE offices that Brandi and I are representing today. I think the important thing to no, is that both of our offices support, as Brandi was saying, addressing all hazards to critical infrastructure in order to mitigate disastrous consequences. We've worked with state, local, tribal, territorial, industry, Federal partners and others to do that. Combined, our offices provide support for the grid and for critical energy infrastructure across the disaster preparedness cycle or timeline. This includes prevention, protection and preparation activities in anticipation of a potential disaster striking. It also includes life-sustaining response and restoration activities in the immediate aftermath of an event. Finally, it includes restoration and long-term recovery support activities to the critical energy infrastructure. We wanted to provide you a bit of an illustration of what the missions mean in practice and I will start off with a few key efforts that the office of electricity is leading, now. Brandi will share the same for June 29. On disaster recovery support, we provides this type of support to some of the nation's most vulnerable communities from remote villages in Alaska to islands in the Pacific and the Caribbean, and in order to mitigate their exposure to energy disruptions. The 2017 hurricane season and the devastation experienced in Puerto Rico and the US Virgin Islands revealed opportunities to enhance DOE's recovery support, which we are working to implement, to lower the cost of future disasters and promote American energy resilience. Second, the office of electricity is creating the North American energy resilience model, which we affectionately call NAERM to analyze a range of threats in areas to US energy infrastructure and interconnected portions of the grid in Canada and Mexico. NAERM is a tool designed to assess the behavior of electric power systems and associated dependencies on natural gas and other critical energy infrastructures beyond energy, as well. Integration of

the industry data will enable unprecedented real time situational awareness and sophisticated analytics to minimize the impact of threats as they continue to evolve in real time. Third, you may be aware that on May 1 of this year, President Trump signed an executive order called securing the United States power system, which the office of electricity is implementing and this order acknowledges that the bulk power system, which is the generation and transmission parts of our electricity system, is a target for malicious cyber activities and these threats constitute a national emergency in light of the role that the bulk power system plays and national defense, the economy, emergency services and the US way of life. It protects power system from being compromised by prohibiting the installation of certain components and replacing existing components where there is a credible threat. Finally, the critical infrastructure is defined in the Federal power act and can be thought of as a unique subtype of critical energy infrastructure that supports national defense and security activities. The office of electricity is leading the department efforts to address needs in this space by managing risk and staying ahead of intensifying threats and working with key partners including at all levels of government and with the private sector.

I will touch briefly on parts of what CESER does. We define energy and security as ensuring a securable flow of energy across the nation and this is achieved through planning on efforts to mitigate the risk to the energy infrastructure and also, planning for preparedness and responding and recovering from events. To help states and industry build capacity around this and to enhance emergency planning. We developed tools, analysis, training and exercises. CESER executes the department's emergency support function, ESF 12 under the National response framework and you might be familiar with the ESF structure. Each state has an ESF 12 responder, as well and we work closely on emergency response with FEMA to facilitate response to energy emergencies. I apologize because it just started pouring outside my house if you can hear that. Cybersecurity is also part of our portfolio. It's really an important part, as well per the frequency, scale and sophistication of cyber threats with the energy infrastructure is growing. Our goals on the cybersecurity side is to strengthen the energy sector preparedness to coordinate cyber incident response and recovery and accelerate the research and developments of tools and technology. As mentioned earlier, DOE takes an all hazard approach and we are looking at risks and hazards and threats and we want to help states understand these risks so they can be better prepared to make informed decisions about their investment, and as well, resilience and hardening strategies. Some of you on the phone, we probably worked with before. In some cases, we have not. Just wanted to note that within your state, we do work closely with quite a few energy officials in the states and the territories and reengage with different roles from governors, energy advises, public utility commissions, and across the board on the states. Also work with industry and maintain a close relationship, mainly through the ONG, STC, with the mission of coordinating efforts to prepare for and respond to national level disasters or threats to critical infrastructure. That was a little bit about this, and we will dive more into what we do. We have quite large portfolios but tried to keep it high-level and narrow for today. We will review at a very high level some energy mitigation projects you could consider and some of the projects that we will cover, DOE helped fund and

others that we didn't. We are happy to have follow-up calls and to go into more details on these projects or to facilitate introductions. If you want to talk to a state or utility who completed some of these projects to hear about their experience, we are happy to facilitate those connections. One of the common things people think about with mitigation is infrastructure hardening. This refers to physically changing the energy asset to make it less susceptible to damage from extreme wind or flooding or flying debris. Hardening includes the durability and stability of the infrastructure, making it better able to withstand impact without having major damage or failure. I want to level set knowing that those on the phone might not have an energy focus. The top right-hand corner, we talk about transmission and distribution with the energy slowing, electricity is slowing. On the top right-hand side, these are the big towers and typically this is the investor owned utilities, the private utilities that was brought up earlier. If you are going that route, it would require that waiver. On the other hand, distribution. That is on the lower right side and these are typically what you would see in the residential neighborhood level with businesses and communities. When you think about projects, you can look at the LMI communities or neighborhoods, specifically, for that set of infrastructure projects. The transmission and distribution infrastructure is mostly damaged by hurricane force winds. For specific distribution systems, hardening includes upgrading wooden poles, they could be concrete or steel and following other types of structural support. It could also be a photo of the underground mines or the power lines, placing utility lines underground to eliminate susceptibility to wind damage and lightning. They can experience this above overhead lines and our guest speaker from Kentucky will touch a little bit on this, as well. It's not shown on the slide, but flood hardening or flood protection is also an option. Elevating equipment, we saw the substations be elevated after super storm Sandy or in some cases, some states looked to potentially relocate some facilities to some areas less likely to flood or less severe earthquakes.

Thanks, Brandi. Continuing along with potential projects and ideas or areas for exploration, I want to talk about energy infrastructure critical to national defense and security. Threats to US national security through the energy sector continued to intensify, including those identified in the 2019 worldwide threat assessment in the 2020-2022 national counterintelligence strategy. More frequent and extreme weather events, aging and outdated energy infrastructure and cyber and physical attacks from determined adversaries can impact domestic military installations, which are connected to the civilian electric grid. In addition to defending the homeland and protecting power abroad, US military bases support domestic response services to state and local emergencies and you can see in the lower right that it was hurricane Matthew. Hardening electric infrastructure serving the installations has a benefit at every level, community, state and regional and at the national levels. If you have a military installation or more than one in your jurisdiction and are interested in and sporting mitigating disaster risks to this infrastructure, please do contact me to follow up to the webinar and I would love to speak with you further and see how we can assess. Moving on to backup power, I think we all are familiar with the need for backup power generation, depending on the threats that we face.

DOE has several offices, none with as good of an acronym as Brandi has in June 29 but they have missions specific to advancing individual technology types that can provide electricity generation during a power outage. As we keep mentioning, Brandi or I would be delighted to connect you with experts from those offices who have expertise to bear at the technology level, as it would be helpful for navigating options related to backup power coming from specific technologies. They can assist on technical requirements, on reviewing potential options and suitable approaches given whatever your jurisdiction's energy, policy, framework or other needs would be. I wanted to mention what a microgrid is encase that that is a new term for anyone today. A microgrid is a local energy grid that can be disconnected from the main grid and operate as its own island powered by generating resources that are directly connected to it. We will keep moving through these project ideas here. Another one is low income backup power and in Washington, DC, Jubilee housing, an affordable housing services provider partnered with a local utility under a program of the DC Department of Energy and the environment to design a rooftop solar array combined with a battery storage system that provides a resiliency center capable of powering a community space within this building for three days during power outages and this provides refrigeration for medication and perishables, lighting, outlets for charging cell phones and other communications devices and a television. This project reduces the utility burden of 100 Jubilee households by $40 to $50 a month for the next evening years, allowing them to put the savings toward other crucial necessities. This was the first of its kind effort to channel the benefits of solar plus storage to low income housing residents who most severely feel the impact of energy outages. Next, we have the Montgomery County, Maryland, microgrid. It's a public purpose microgrid allowing key facilities in the County to operate without any power from the utility grid, ensuring public safety and to the continuity of public services during major electric distribution system outages from storms and other disasters. The county has, unfortunately, had a history of experiencing major storms. The microgrids include clean energy technology like solar panels, combined heat and power systems, batteries and advanced controllers including built in cybersecurity. Brandi, to you for the next one.

I should go back for one second. I live in Montgomery County and remember those outages years ago. It's a good example to note for the inclusion of cybersecurity. We encourage you thinking about these projects. If you are looking at technology vendors, keep cybersecurity in mind for thinking about what the companies are going to do from the IT and the OT side and keeping that part of the conversation as you look at the different projects. And for finding a project that was a slightly different flavor, it comes from public utilities. It's an example of how a utility can increase community resilience in the case of providing electricity resources, even if the transmission lines have been blown down or power is destructed for some reason. Maybe a disaster such as an earthquake or flood, having a diverse and renewable power supply can help provide critical services during response and recovery. Specifically, this is from Oregon and it is a municipal or public power utility. This project was partially funded by the by the DOE office of OE and also, the Oregon State Department of Energy. The utility partnered with the school district to open up a new microgrid emergency water station at an

elementary school. The goal for this project was to ensure immediate and reliable supplies of water following disaster. Not necessarily a focus on energy of the end goal but knowing that a massive earthquake could prevent people from being able to have access to clean water. They looked at an energy solution for the problem. The roof had been designed to continue charging the battery system during an outage and even if they are connected to the grid, they are able to charge the battery and the battery provides redundancy with backup power even when the sun is not shining. It will keep the school and water distribution site up and operating in emergency situations. Also, there are additional goals about reduced emissions. This was a favorable project for the generators. And earlier, it includes liquid fuels. Multiple states developed programs to ensure access to fuel during emergencies, even when the power is out. Many of you might remember after super storm Sandy, the gas supply disruption was up and down parts of the east coast. It escalated to the point where it was becoming a public safety concern and effect and well-being within the region. Other states have been affected by harsh winter storms and looked at how they make sure that access to fuel is available at all times. Not only for emergency vehicles, but fuel for generators and the public at large. The Wisconsin office of energy used the DOE state funds to establish a generator readiness program for County highways and convenience stores and as I mentioned, a few other states have set up similar programs like this, ensuring that it automated the transfer switch that you saw in the photo. It makes an easy process to flip on the generator and keep the power up. In New York, Governor Cuomo signed this into legislation, requiring the strategic station to install wiring and a switch to make sure they are ready to use that backup generator. And I want to note that some of these are interesting because they are joint efforts. In Michigan, for example, it's a Public Utility Commission and it is the state police with these partnerships across different state agencies. Now, we will hand it off to Kentucky. I want to say a big thanks to Kenya Stump to volunteer to speak with us today. We really appreciate it.

Thank you, Johanna and Brandi. I am Kenya Stump with the Kentucky office of energy policy. I'm so glad to be with you today to talk about our perspective on hazard mitigation and energy resilience. Earlier, we had the mission in our office to support the utilization of Kentucky's energy resources for the betterment of the Commonwealth while protecting and improving the environment and central to that mission is our role in energy assurance for the Commonwealth of Kentucky. One of our central goals, as I said, is energy assurance that we take it a little further, and that one of our goals we've established for ourselves and our office, is to enhance the energy resilience and security of the Commonwealth by identifying opportunities to increase our ability to respond effectively to an energy disruption and to recover quickly, along with maintaining the uninterrupted supply of energy resources to the Commonwealth at affordable prices. I know a lot of you on the call today may be unfamiliar with the state energy offices and I'd like to take this opportunity to encourage you to reach out to your state energy office. Most energy offices throughout the nation do have a focus on energy assurance and planning efforts and they also are a host of resources in terms of technology options, funding resources and as well, data on your energy infrastructure that you may look at for your own state or even at

your critical facility. I think this webinar is an opportunity to establish a way that the CDBG -MIT applicants can also coordinate with their energy office. We will see, maybe, how the two can work together. I'd like to go through this. This is a picture in Kentucky, and I will go through our risk profile. This was 2009. We had a significant ice storm in Kentucky that paralyzed the majority of our state. Since 2009, we've had a lot of experience with lessons learned from this and other disasters. Specifically, recently, we had experience with a large power outage during our pandemic response. It also highlighted some additional vulnerabilities that we will be addressing, as we move forward, as well. When you have a large portion of your population being what we call healthy at home, and then the power goes out, it highlights potential vulnerabilities that you may not have realized before under other hazard scenarios. So, when we look at our hazard frequency in this state, there are four that really come to mind. We are subject to flooding, major severe storm events -- that was the one that actually affected us during our pandemic response. We had a severe thunderstorm coupled with heavy rain that created issues for our power sector. Of course, tornadoes. We have tornadoes, as well, here. And extreme winter cold and storms, as you just saw with our ice storm. From the energy office perspective, we looked throughout our state to look at what hazards our state is prone to. Last year, we had a large tabletop exercise, shake and fury. Luckily, we haven't had an experience with earthquakes, but we do have a significant potential for an earthquake here in Kentucky, as well and we are preparing for that. We are seeing more extreme heat and extreme cold events along with more frequent severe thunderstorms. Our energy infrastructure -- we are fortunate in the state of Kentucky that we have a robust energy infrastructure that is quite diverse. We have over 43 miles of pipeline infrastructure that includes natural gas, hydrocarbon liquids and hazardous liquids and we do have natural gas storage areas, as well, and the associated processing plants and pressure stations throughout our state. On the fuel side, we are fortunate that we have two oil refineries within our state along with biofuel plants and we have an ethylene cracker in Western Kentucky that supports our chemical industries in the West. With that significant refinery footprint, we have 21 project terminals resulting in over 2500 fuel distributors, including over 240 propane distributors. On the electricity side, we are a hub, we see ourselves as a hub -- we connect north, south, east and west when we look at our transmission capacity with over 10,000 miles of electric transmission lines and 1700 substations. We also have quite a diversity in our power plants. We are what we call a regulated state. We have utilities that operate in wholesale markets, as well as our you miss a pill and the utilities that are not part of any kind of market along with our Federal partner, the Tennessee Valley Authority. We have quite a diverse power perspective in the state and I think that shows how that can be an asset to us when we have that kind of diversity in Kentucky. On two mitigations, in Kentucky, our traditional energy mitigation measures, when we look at what traditionally we've funded, is very similar to what Brandi and Johanna spoke of. We have a lot of experience with backup power supplies and our utilities, where there have been approvals for underground dating and we've seen a lot of utility pole replacement, wooden poles to stronger supports. One measure often overlooked is vegetation management. When we look at one of the number one reasons where we see power outages, it's on the distribution system and a lot of

that is due to vegetation. Vegetation management is also a critical mitigation activity for us. I mentioned flood proofing of critical infrastructure, raising structures and as mentioned, with substations, securing tanks. It's for the flood prone areas and then, building berms or flood walls around the critical infrastructure assets. When we look across our state, we see what we call emerging energy sector mitigation solutions. I'm going to start with distributed energy resources. When we say distributed energy resources, we include things like energy efficiency, distributed generation like rooftop solar, combined heat and power facilities and demand response and anything that can respond to a signal at the distribution level that can control or conserve energy. Electric vehicles could be included, as well, since there's electric vehicles to grid solutions and also, connected buildings would play into the distributed energy resources. As mentioned, we have experience with microgrids and we also use the term resilient hubs or community enclaves and that is a way of talking about a Region that might explore microgrids and we will get in a little bit more about resilient hubs later in the presentation. I realize you all heard a previous presentation on energy efficiency and building for resilience. We see that as an emerging area in terms of codes and resilient codes and how we enable affordable housing renovations that are more resilient. Smart grid improvements is a big topic, a big term. When I speak of smart grids, I'm speaking of things such as advanced sensing of the electrical grid and even have advanced metering infrastructure on the water side, as well. Increased data penetration is more visibility into your substations and remote sensing of your grid system and automatic switching of circuits and reconfiguration that would allow your grid to sense and reconfigure itself during an event and for your critical facilities, a simple but often overlooked area is having dual feeds from the grid into critical facilities and redundant systems. We are also, in this state, looking at regional refueling centers and fuel diversification as a mitigation solution, as well. I'm going to go through a few projects and examples. Not all of these were funded out of the energy office but it gives a flavor of the types of projects we would look at for energy resilience and maybe spur creative thinking when you look at your own state and what you have available to you there. I like to begin with a vision. This is an example of a project we do at the energy office. If I look at GIS and I look at what I'm calling all of our critical facilities, meaning fire, law enforcement, water supply, wastewater, Healthcare, correctional facilities -- if we look at a density map, you can see from naturally occurring areas, that it could be energy resilient hubs. This is a good place to start at the state level when we look at resilience planning efforts. How do we support these regions of our state to become more energy resilient and to be able to withstand an long-term energy disruption? The state, as a whole, could become resilient if we look at having these regional hubs that can support the community lifelines in these areas of our state. So, that's what our vision is as we move forward. One way we do that is the micro grid. Fort Knox, since the 2009 ice storm, Fort Knox is the major facility with DoD, in terms of the operations and what they support. Fort Knox, as a result of the ice storm, set themselves on a path to develop a micro grid. It involves solar, geothermal, energy efficiency, automation along with combined heat and power. They are very fortunate and have their own gas supply, which also makes them more resilient when they have access to their own fuel

supply, as well. You can see here some of the quotes. It sums it up very nicely. Fort Knox sees themselves as lessening the load on the community, and that makes it easier for the utility to respond when there is a major event. Every year, Fort Knox disconnects and tests their emergency micro grid. They did one just last year and I've linked to the article on that. But it's something to see. Fort Knox takes the entire base off-line and within 12 minutes, they can have the entire facility back online and running independent of the grid. Our second project is actually the US Green building Council and the certification. We used their certifying framework called PEER, performance excellence in electricity renewal. It certifies the power system and we had three certifications in Kentucky and Fort Knox was one of those, given that they were already an emergency micro grid. We were also able to do a certification with our electric cooperatives and a municipal electric organization, the city of Glasco. This was able to basically allow evaluation framework of the resilience of the power systems. Nolin rural electric was the first cooperative in the nation to be certified under that framework. It's a great tool for analysis for power systems and can highlight vulnerabilities, as well as highlight opportunities of how you can make your power system more resilient. If you'd like more information on PEER, I give the link there and there is a link to the video on our project. If you are familiar with certification for buildings, PEER is the version for power systems focused on measuring and evaluating resilience. Building for resilience -- it's a project from our office and we are working with affordable housing groups and how to build affordable housing units more resilient with different techniques and to get their volunteers and construction crews trained on these techniques. Structural panels, we are working with the Kentucky habitat for humanity and they recently completed a project for a veteran housing project using the increased energy fix and it adds to the resilience of the structure in terms of wind and tornadoes. We see that as a win-win for our affordable housing groups. The Eastern Kentucky housing organization is also wanting to explore a building with SIPT and we provided funding to train them on SIPT construction. Insulated concrete forms, the Morgan County storm shelter is built with ICF in Kentucky, recognized as one of the building techniques that enhances resilience in structures. We are also providing education into that, as well. We are doing energy certification on affordable housing units, as well as construction job training for those coming out of addiction recovery and how to move workforce development into the energy sector and tackling the struggles that we have with addiction in our state. Relating to schools, as of January 1, 2019, all new schools are required to provide a storm shelter large enough for the school's occupants. This storm shelter was built with ICF and we see that as a great way to complete and meet that requirement for our schools. This is an example of West Liberty, Kentucky. On March 2, 2012, we had an EF3 tornado ripped through this community in Kentucky. What is interesting about this, is the community, itself, decided to rebuild with 21st century, lower cost and sustainable infrastructure and to develop a path to create job producing business opportunities and increase the tax base and attract new residents. They did this with a whole host of solutions, including affordable housing and geothermal applications, commercial businesses and solar and some affordable housing locations. They have an energy dashboard to identify where energy is being utilized and how and to identify areas of the community. This is a great example of rebuilding

back for resilience in West Liberty, Kentucky. Here's an example that is very relevant to our pandemic response. A senior living facility and health care, critical areas of need in the COVID-19 response. This retirement community in Covington was able to use what we call PACE financing to address energy efficiency projects. We see this as also resilient, and that it is helping the facility remain operational and also, meeting the comfort needs of the residents. We saw that as a critical area, the states did, as well. During the COVID-19 response, as well. Similarly, we have a great example of Norton Healthcare Audubon Hospital able to do a lot of efficiency that speaks to resilience. If the hospital is financially healthy and operationally sound, that really contributes to the overall resilience of our health care system. As well, being able to meet the needs of the patients. The energy efficiency measures taken at Norton Healthcare Audubon was essential for them to be able to add additional capacity and also, save utility cost and improve operations and they did this through building automation and a hybrid energy plant combining chillers with thermal storage and all of these together make Norton Healthcare Audubon Hospital more resilient. Smart grid, we have some fast facts. 40% of the meters in Kentucky are considered advanced metering infrastructures and 10% of our circuits in Kentucky had voltage optimization. We recently had a cooperative receive a USDA grant to do additional smart grid technologies and we do see the smart grid as an evolving mitigation as well. It allows for more remote sensing and efficiency on the supply side, as well as ability to sense and dispatch measures more quickly than traditional grid technologies would allow. All of that said, I know we are here today to talk about CDBG-MIT funding but when I look at resilience from the perspective of the Kentucky energy office, it is a funding puzzle that you have to piece together. I think HUD and CDBG are obviously part of the puzzle but we have private sector investment from our utilities and our private energy sector partners and you have private foundations, FEMA's traditional mitigation funding and as I mentioned in this presentation, USDA rural development and innovative financing opportunities such as paid financing and energy savings performance contracting and in our office, we do projects through the state energy program funding and of course, most states also have weatherization programs and your utility investments may be coming through your Public service commission and recently, we now have the CARES Act funding coming down into the affordable housing organizations, as well. Seeing how we can leverage CARES Act funding to also address the needs of those who need it. Also, hopefully, to have more resilience to the system. I will say that we are working with the smart electric power lines to evaluate microgrid opportunities back to that begin with the vision with our resilience hub and we are looking to see what the feasibility is four microgrid solutions throughout our state and that is a project we are working on. We also are working on utilizing the reclaimed land as potential sites for solar projects and maybe solar plus batteries that could support grid resilience, as well. Today's presentation was to give you a flavor of how our energy office approaches mitigation and resilience in our state and how we have to take a holistic view. We are happy to learn more about CDBG funding and how our office can work with potential applicants, potentially, to develop projects and maybe, also, leverage that funding for some of these other funding sources, as well. With that, Brandi and Johanna, I would happy to turn it back to you all and we can address any questions.

Thanks so much. That is great. We have a lot of projects in the state and it sounds like you are leading the way. With some of the approaches you are taking, and thanks so much. We want to touch briefly when you think about what projects are from the energy standpoint of the resources you already have within the state, all states and territories have energy assurance plans. Some of the data that can you referenced about historical outages and profiles in the current infrastructure and what it looks like, the landscape -- what access you have to equipment should all be included in that plan and it's definitely a good place to start and to look at that energy assurance plan. Just a few other examples with states putting together resilience plans and climate plans not specific to energy but often include energy. Take a look at those. Comprehensive energy plans, action plans -- this typically is a little bit larger and long term, and they've outlined different strategies to become more resilient and more reliable and potentially, other alternatives or energy projects that might already have been designed or scoped out. I don't have a picture of. But I will mention that lots of states have petroleum shortage response plans and that is another thing you might want to take a look at.

Thank you, Brandi, or whoever is advancing the slides. We wanted to share this example from North Carolina earlier this month. North Carolina released its climate risk assessment and resilience plan, a statewide effort covering hazards, vulnerabilities and risks for 11 critical infrastructure sectors. It's discussed in Chapter 5 L, if you would like to take a look and follow in today's webinar. This is a first step in the long-term strategy and the framework that the state can use to guide state action, engage policymakers and stakeholders and facilitate collaboration across the state. I thought this table was a nice way to take a look at these different elements of critical energy infrastructure that Brandi mentioned earlier on. And, to do an assessment of the vulnerability to these different types of threats and hazards. I think this is a good example of how strategies the state is coming up with link back to the energy lifeline needs assessment that they did, which is what Jen had discussed at the beginning of the webinar for the HUD CDBG-MIT approaches, as well. Before we moved to more discussion, we thought that it might be useful to just post some thought-provoking questions that you might like to consider talking to your colleagues about it. Have you determined what energy infrastructure is critical to mitigating disaster risks and reducing future losses? Where you are, have you conducted a vulnerability or risk assessment of that critical energy infrastructure, including impacts if vulnerabilities are left unaddressed? Have you developed energy resilience strategies? These are foundational questions that are a good summary of the material we have presented today and hopefully, we will give you some good food for thought, as you move forward. Roosevelt, are we going back to you, now?

Yes. Thank you. First of all, I'd like to thank Brandi, Johanna, can you and of course, Jen, for all the great information they provided us today. We really appreciate the joint webinar from the office of electricity and the cybersecurity energy security and emergency response office, as well. And, working in conjunction with the disaster recovery and special issues for the policy unit to put this together. Again, Jen talked about the

importance of addressing current and future risk and in this presentation, we looked at opportunities for aligning the CB DG mitt purpose and goal was the DOE space and looking at potential funding opportunities to teach critical energy lifelines. We want to talk a little bit about the value of energy resilience and action plans and meeting CDBG-MIT goals. Jen spoke about the four primary goals for the CDBG-MIT program and here, we have supporting program investments addressing repetitive loss of property and critical infrastructure. Again, the information from can you and Brandi and Johanna talking about various infrastructure resilience activities, including examples of battery storage. For HUD goal number two, building capacity to comprehensively analyze disaster risk and update your mitigation plans. Can you, I believe, spoke to energy planning and using that to promote energy assurance. Jen spoke to the importance of the mitigation plan and, in particular, the hazard identification risk assessment component of that MIT plan to feed into the baseline, if you will, for your mitigation needs assessment. Can you spoke to the Kentucky energy sector profile and we had discussions from Brandi on the CESER program, including energy security planning and cybersecurity tools, in particular, with research and development. I believe Johanna talked about the climate risk assessment and resilience plan and provided that as a best practice for your consideration. HUD goal number three, we looked at the local and regional priorities and how we can have a lasting effect on promoting the community risk reduction, including protecting community lifelines and decreasing future disaster costs. There was an example provided for the backup power options and I think microgrids for Montgomery, Maryland and Kenya spoke to the Kentucky use of LEED certifications and affordable sustainable housing and she spoke about smart grids. Last, we have HUD goal number four, looking at maximizing the impact of funds and leveraging public and private partnerships and coordinating with other Federal dollars. Some examples of that partnership include energy sector engagement partners including NEMA and the energy sector engagement partners. We had a relevant and useful example and then we have examples of potential funding with the USDA electric loan program. This is a very high level and quick snapshot of some of the great information that we have today and, again, I'd like to acknowledge the assistance for the partners but then Kenya is representing the Commonwealth of Kentucky. Here are some quick examples of resources and here is a FEMA resource connected to mitigation planning. If you look at the last bullet, it speaks to the National response framework and that document has some great information on community lifelines and, in particular, energy related activities. Here are some great resources for DOE and state resources. Please take a look at that first bullet. The energy transitions initiative, and we have the DOE low income energy affordability data tool and we have the fourth bullet down with information on solar and storage sizing, which should be very helpful as you look to design your mitigation projects. We have resources from CDBG-MIT and if you look at the last two bullets, the second is a reference to the Federal Register notice published last August. It has program requirements that Jen spoke to at the beginning for the mitigation program requirements and the purpose and background. We also have the webinar series that we published last year, the fall of last year, that contains a lot of useful crosscutting requirements connected to the CDBG-MIT program. Here is some information with links for the office of

electricity and, also, for the CESER program. Brandi and Johanna spoke with those respectively and we thank them again for supporting us today. If you have questions not answered today and you'd like to submit those, here is the email address., DRSIPolicyUnit@hud.gov. With that, I'd like to initiate our Q&A session. We are running out of time and we will keep it brief but the first question I'd like to pose to the panelists, can CDBG-MIT funds be used for energy efficiency improvement?

Yes. This is Jen. In the case of energy efficiency, we did a previous webinar with the resources available and again, for us, any sort of activity, we always focus on what is the CDBG-MIT eligibility category and if it meets national objectives. In this case, there is additional criteria and the MIT notice doesn't meet the definition of mitigation and we have additional national objectives in the notice. You want to make sure you are going through that checklist in your head and isn't eligible in the programs? Usually energy efficiency improvements to a home can be part of an eligible rehab activity but I think the key is bringing that back to mitigation and how your meeting that definition with those types of activities but it could certainly be part of a holistic program or if you are doing a new construction program, focusing the benefit to the homeowners in reducing those energy costs and how the whole development with costs are necessary and reasonable that we will have for any program design when you are speaking about those kinds of activities. Anyone else want to join in?

From allowability, I think Jen covered up but when you are looking at energy projects, it could be comprehensive and to think holistically, as Kenya measured with energy efficiency and in betting those into the projects you design.

The second question is, could the panel talk about potential eligibility for some of the activities on the presentation related to CDBG-MIT?

This is Jen again. Most of the activities we are talking about, the types of activities, in general in the presentation, would fall under the category in CB DG of public improvements. This is a category where we usually fund infrastructure activities and the CDBG program identifies publicly owned facilities and infrastructure. Usually, we talk about streets or playgrounds, underground utilities, something we talked about today. Buildings owned by nonprofits open to the general public, that is usually what we talk about in this category of public facilities and improvements. A lot of the activities we are talking about would fall under that category of eligibility but as just mentioned, you have these additional eligibility criteria and the mitigation notice that you want to go back to make sure you meet the additional criteria and meet the national objective. In addition to thinking about those types of projects and how they fit under the CDBG-MIT, the funding, it brings in additional resources. You want to think about that as you design a project to get multiple benefits. The investments in public facilities and improvements can be strengthened by working with partners and leveraging other non-CDBG resources, which is one of the reasons why we wanted to work with our Federal partners with DOE and FEMA, to talk about these kinds of other resources. I will throw it over to them if they want to jump in on that, as well.

This is Johanna. I agree and as you look at how the states and other jurisdictions are approaching these issues, you know, it doesn't make sense to start with a funding source and then sort of build your strategy from a more narrow eligibility criteria for something specific. You may not meet your overall needs that way and you really need to start with what you are looking to mitigate and how you are assessing what your needs are regarding the impact to infrastructure and how you want to mitigate those. From there, you want to put together, as Kenya showed very nicely, maybe try to fit these puzzle pieces together so that you can cover all the grounds that you need to. You really do need to start at that strategic level and that is what you do observe when you see the types of plans that are being pulled together, like the North Carolina one we presented earlier. To the extent that this program can support your needs in a maximum way, it's great to work that into your overall strategy.

Kenya, do you want to speak to that more or Jen, if you want to follow on, as well?

Yes. This is Kenya. I will follow on. We have examples in our state where we've leveraged -- it might not be CDBG-MIT -- but funding in partnership with our energy savings performance contracting. I think this is a great space to really talk to a large utility. Utilities have a lot of resilience planning, and I'm speaking in terms of the power sector, they have a lot of insights to share that once you identify a critical facility -- and I say critical facility -- I mean a broader view critical facility among all the lifelines -- utilities can really talk to you about what are projects you can do to support their utilities and support those critical facilities. It might be the water or wastewater plant or your health care facility and I think holistic planning, we just completed what we call the energy assurance toolkit for local governments, local communities with the eye on looking at critical facilities and see energy needs of your critical facilities and I would start by asking that question. The critical facilities, in terms of ensuring your community lifeline and what other energy needs are there and what are the gaps and you have to ask what happens when the power is out or what happens when the fuel supply is disrupted? You know, we found out during the pandemic that most of our hospitals, they only had three days of fuel supply, 2-3 days of fuel supply and beyond that, do you have a fuel supply plan? One question usually leads to more questions but that's part of what we mentioned earlier, this overall strategic kind of view of looking at your critical facilities and the energy infrastructure that supports those facilities and then asked, what can you do under this particular funding knowing that there are other funding sources out there that can complete the picture, complete the puzzle. You know, we've focused on affordable housing. It does double duty when you do efficiency and resilient building techniques and you get a checkbox with energy efficiency and also, you meet that resilience criteria of mitigating against the threat of tornadoes or high wind. You know, a lot of the times you might be able to find a solution to check a number of different boxes and those are the few thoughts I've had from the state perspective. I encourage you to talk to the utility and to your energy office and to

work with those in your mitigation planning at the local lever. That's where you can start to get this more holistic picture.

Thank you so much. We are running out of time, so I want to give a quick minute to Jen to close it out. Before we do I remind you that if you have subsequent questions past today's webinar, please start with the DRSIPolicyUnit@hud.gov email box and there are links for this presentation and to the cybersecurity and energy security and emergency response program and the DOE office of electricity. With that, I like to turn it over to Jen to say a few words to close us out.

Thanks, Roosevelt. Since this is our last webinar, we wanted to let everyone know that we will be doing another round of webinars in August and into September and we've got a lot of topics cued out. I think we'll have a lot in that series, as well and we hope you enjoyed these. If you do have suggestions for webinars, for grantees, if you have's objections and topics you'd like covered in future webinars, send us an email at that website and give us some ideas because we want to make sure that we are meeting the needs that you guys have identified. Please feel free to reach out and we probably will, as of right now, on the docket for August, we are talking about covering some things that were normally covered at the problem-solving clinic, like patient benefits, option relocation and we are talking about maybe doing a session on best practices for regional coordination and different types of housing programs grantees can run. Those are the ideas we are working with now. If you have thoughts, let us know. And lastly, thank you to Roosevelt. His detail with our office is ending soon and he's done a great job on these webinars and I want to thank him for all the work with our Federal partners to get all the folks together to do these webinars and I think it has been a great resource for everyone. Thanks to Roosevelt and thank you to everyone. That concludes our webinar for today.

Thank you very much.

[Event concluded]