

Elizabeth McNamee: Hi everyone. Thanks for joining. We're going to get started in just a couple of minutes.

All right, seeing that it is now the top of the hour, I'm happy to kick things off. Good morning, and welcome everyone to the 2022 Better Buildings Summer Webinar series dedicated to bringing you the latest actionable insights from leading industry experts. This annual series is a chance to explore the topics, technologies and trends that affect your organization, as well as efforts to accelerate energy efficiency adoption.

Before we dive in, there's a few housekeeping items that I'd like to quickly cover. Please note today's webinar will be recorded and archived on the Better Buildings Solution Center. We will follow up when today's recordings and slides are made available. And next, all attendees are in listen only mode, meaning your microphones are muted. If you experience any audio or visual issues throughout the webinar, please send a message in the Q&A box located at the bottom of the panel. Next slide please.

And can go one more. My name's Elizabeth McNamee, and I'll be your moderator for today. I've been a fellow at the Department of Energy for the past two years. And over the course of my time here I've been working on the State and Local Planning for Energy Platform, or SLOPE as I'll refer to it from here on out. Which is going to be the focus of our session today. Next slide.

So today we're first going to provide an introduction to what the SLOPE platform is, and what types of state and local energy planning it can help support. Since SLOPE's initial launch a few years ago, we've regularly added new data to the platform, so even if you've used slope before, there may be some more recent additions that we can introduce you to as well.

Next, we're going to provide a demo of some of the platform's functionality, using some planning questions that the Atlanta Regional Commission has to guide our demo. We're next going to reflect on how SLOPE was able to support the Atlanta Regional Commission in some of their efforts. And then finally we're going to end with a Q&A. Next slide.

So today we'll be using an interactive platform for Q&A, polling and feedback. If you can please go to [slido.com](https://www.slido.com) on your mobile device or by opening a new window in your Internet browser, that would be great. And enter today's event code, which is hashtag DOE. So if you would like to ask our panelists questions, please

submit them anytime throughout the presentation, and we're going to be answering some questions near the end of the session. On Slido you're also able to select the thumbs up icon for any questions that you like, which will result in the most popular ones moving to the top of the queue. Next slide please.

So first, we'd love to just learn a bit more about our audience today. So we're planning to start off with two poll questions. If you could please join us over at Slido to respond to the following questions, that would be great. And again, if you're having any issues, please message our tech support team using the Q&A function.

All right. So, we're going to our first poll. The first question is just seeing which sector folks are from, which will help us just get a better sense of our audience. So it looks like we have a lot of local government folks, some state government folks, NGOs, consultants and energy service providers, a lot of folks under other. So this is great to see. It looks like we have a pretty fair mix of sectors here.

SLOPE is primarily designed to support state and local governments, but can certainly be extremely valuable and useful to folks in all of these sectors as well. So happy to see such a good mix. But especially state and local government folks. So that's great, thanks for your input. And if we can go to our second intro question. Let's do that.

So second one, just a quick question. How familiar you are with SLOPE. If this is your first time learning about SLOPE, let us know. If you've used it before, or just a little bit before, let us know that as well. And it looks like a lot of folks here are learning about SLOPE for the first time. So, great to see so many new potential users, and you are in the right place. All right. I think that is good for our intro poll questions. Thanks very much for your responses, and we'll try to be sure to tailor the rest of our call to this group.

All right, so today we have a great lineup of presenters. First, we're going to have Shannon Zaret, who's an energy technology program specialist at the Department of Energy's weatherization and intergovernmental programs office. At DOE, Shannon manages the SLOPE platform and the low income energy affordability data tool, or the LEAD tool. And together they collectively integrate and deliver data on energy efficiency, renewable energy, sustainable transportation, and energy burden

into easy to access online platforms to enable data driven state and local energy planning.

Next we have Dr. Katie Richardson, who's a group manager at NREL's Innovation and Entrepreneurship Center, and serves as the lead of the SLOPE platform on the NREL side. She also supports the growth of lab wide partnerships with charitable foundations and delivers technical assistance to cities pursuing a clean energy transition. And Katie holds a Ph.D. in physics.

And finally we have Kofi Wakhisi, who's a team leader within the Transportation Access and Mobility group at Atlanta Regional Commission. Kofi has participated in numerous transportation research board panels and is the current chair of the association of Metropolitan Planning Organization's Technical Committee. Kofi holds a bachelor of civil engineering and a master of city and regional planning from Georgia Tech, and a law degree from Georgia State University. He's a member of the Georgia Bar and American Institute of Certified Planners.

So thank you very much to all of our speakers for being with us today. And with that, I'm happy to go to the next slide and hand it over to Shannon to give us an introduction to SLOPE.

Shannon Zaret:

All right. So I'm actually excited that most of you have not heard of SLOPE. So my section will provide you with some really good context. So I'm going to give you just a quick overview to give you guys some idea of what you can use SLOPE for. So, I like to think of SLOPE as the ultimate data aggregator. And so it's easy to use, and it essentially has a ton of data to support your energy planning uses. And so, I'm going to have you move to the next slide so I can show you some examples, so you can frame this into context.

Essentially, there are two main tools within SLOPE. There's the Scenario Planner and the Data Viewer. And so the Scenario Planner allows you to compare the impacts of different energy strategies on CO2 emissions, energy consumption, and system costs for your jurisdiction. And so that means if you were to increase the deployment of different energy efficiency techniques or you know, increase electrification, what would that look like for your jurisdiction in the future.

The Data Viewer on the other hand has a ton of different interactive maps and charts. So you can look at what is the impact of renewable energy. So what is the generation potential of

renewable energy. What is the potential sustainable transportation in your jurisdiction. Energy equity considerations, energy cost data. So there's a lot of different options that you can explore within these two tools. And so later on, we're going to get both a good demonstration from Katie, so you can see what these tools do. And then Kofi's actually going to walk through what Atlanta actually used these tools for. So next slide.

And so let's look at the Scenario Planner a little bit more. So, like I said, essentially what we're doing, this is newer. So we had released the scenario planner back in January. And so essentially what you can do or your jurisdiction is you can layer different scenarios to see if you were for example you know, to have widespread grid decarbonization.

Or, if you were to implement significant energy efficiency techniques in your buildings. Or, you were to implement you know, greater electrification. You were to bring in greater EVs. How would that affect your CO2 emissions? How would that effect system costs? And so I'm going to show you just a very simplified illustrative example. It seems, you know, it would be kind of intuitive, but it's a good example for us to explore the functionality of the scenario planner. So next slide.

So, let's take an example from Indiana. So on the referenced case to the left, we're looking at Hamilton County, Indiana. And so it can be a little bit hard to see, because I know the numbers are small. So what essentially you're looking at here are CO2 emissions, okay? Of different sectors. So which sector is contributing most to your CO2 emissions.

So the blue color represents the transportation for Hamilton, Indiana. So essentially what we're seeing is more than 50% of Hamilton's transportation sectors and counties for their CO2 emissions. And so essentially if they were to focus their policy towards widespread electrification. So, widespread vehicle electrification and making sure that they're implementing EVs. You could see that by 2050 there would be a significant reduction, if you look on the right hand side, the widespread electrification scenario under scenario two. You would see that those GHG emissions would fall significantly.

Now that's a pretty intuitive example, but I think it's a good example, just so you can see what we're talking about in terms of what the scenario planner is showing you. Of course, there are going to be examples that are a lot more complex and complicated,

and a lot more policies that are complex. But I think that this is a good example, just to show you what the scenario planner is actually trying to show.

And so of course, underneath we'll also have some planning implications as well. And so it will also show you the planning metrics. It will tell you what percentage of your fleet will be electrified. And so when we talk about SLOPE data, just know that SLOPE data doesn't necessarily need to stop at SLOPE. The DOE, NREL, a lot of our national labs have a lot of other tools. So, we're going to show you a few examples that if you've got SLOPE data you can plug that data into other tools and get a lot of other information.

So for example, if you were to know what percentage of you know, electric vehicles you would have, you'd be able to use another tool to estimate how much charging infrastructure for example that you would need to accommodate that many EVs. So there's a lot of really great additional steps you can take once you've got that key SLOPE data. Okay, next slide.

Okay, so that's the Scenario Planner. So it's showing you the impact of different strategies. So number one, it's showing you which sector is contributing most to your GHG, your energy consumption and your system costs. And it's showing you number two, how you can target policies to make the most impact towards reducing your GHG, towards reducing system costs and energy consumption.

The Data Viewer has a whole lot of information with regards to energy consumption, transportation, energy efficiency, looking at in terms of solar, wind, bioenergy, geothermal, hydropower, so looking at generation potential. And so I'll show you another illustrative example of which of these resources might be the best for your region to implement. We've also added cost of energy, demographic data, and recently we've added energy and environmental justice data.

And so you can kind of look at all of these things, and especially when it comes to energy environmental justice to ensure that your renewable energy projects, your energy projects, can benefit those communities as well. So let's take a look at what the Data Viewer can actually do. Let's look at the next slide to show you an illustrative example of what you can look at.

So we're going to take a look at Hamilton County again. And so

with the Data Viewer, we're taking a look at generation potential. And so we're going to see which technology or which resource has the greatest potential for Hamilton County. And so it's going to be hard again for you to see this particular graph. But on the left hand side, what we're talking about is cost per megawatt house. And so essentially, over time for this particular county, it's indicating that wind and hydropower are the best options for them.

They're the cheapest options for them. And so essentially if you're looking over then now at the modeled annual technical generation potential on the right hand side, it may look as though Hamilton, you know, you're looking at that colorized square. And yet it's kind of that lighter green. It may not look as strong as some of the other counties. But still, it's showing that Hamilton can still reach 50% of its electricity needs with wind energy. And so these are really powerful metrics that you're getting out of the Data Viewer.

So what you're basically able to see is which particular resource is going to have the post bang for its buck. And how much generation potential that you could possibly yield out of that particular resource. So it's a very powerful tool that you can utilize, both the Scenario Planner and the Data Viewer. So those are just some good practical applications, you know. Especially for those of you who have not heard of SLOPE before, which is very simplified applications for this tool. Okay, next slide.

Okay, so we're consistently adding new data. And we typically do that based on feedback from our users. And so recently, we've added especially you know, considering equity considerations, we have added CDC social vulnerability index, LMI Single Family Homes Bill savings potential, and so essentially what we're looking to do is to you know, help jurisdictions ensure that as they're making these plans, as they're expanding energy infrastructure, those projects can also benefit energy justice communities.

In terms of LMI, the LMI communities want to make sure that low to moderate income households could realize energy efficiency retrofit savings. And then we've also layered household energy and transportation burden as well. And so those are really key pieces of information when we're considering planning as well. Okay, next slide.

So we also have SLOPE stories. And we're going to hear a real life SLOPE story in a few minutes with Atlanta. But we encourage you on the SLOPE website, we already have several published stories.

It gets you to see how jurisdictions are actively using SLOPE. And so a couple of good case studies, Milwaukee, New Mexico and Sarasota. So Milwaukee utilized SLOPE. So they were essentially trying to figure out the sectors that would have the biggest impact on reducing costs and emissions. So very similar to the way that I showed how the Scenario Planner identified for Hamilton, transportation sector was the biggest emitter of CO2.

And then determining which renewable technologies would be the most cost effective over time. So very similar where wind and hydro would work for Hamilton, Indiana. And then in the case of New Mexico, very similar thing, identifying technologies that can help them support energy affordability. And then another key thing that both Sarasota and New Mexico were looking to do is trying to determine the impacts that vehicle electrification would have on electricity demand.

And as you can see, transportation tends to be the key sector that most jurisdictions have to reduce when they're considering GHG. And so what is the impact of the increased vehicle electrification on their electricity demand? What is that going to look like out in the future. And so that's a very key question that we can answer through SLOPE.

And so I highly encourage you to read through those stories. Again, we'll walk through the way that Atlanta has used SLOPE. It's really nice to see how these jurisdictions are thinking about SLOPE for some of their planning needs. Okay, next slide.

Okay, so that again, this I'm just going to close out here and just remind you, so it's a really nice streamlined tool. I just want to reiterate. SLOPE is a really key aggregator of data. We've put a lot of really key sources of information on this site, and again, you know, we really rely on user feedback. So we encourage you to reach out to us. If you're interested in SLOPE following this presentation, we'd really love to hear from jurisdictions. We want to hear from state and local planners.

And we want to learn about how you're using SLOPE, or how you think that we could modify data, how we can add data, how we can improve the user experience. So we encourage you to reach out to us about that. But know that we've designed SLOPE so that you can identify high impact technologies and sectors to help you prioritize investments and planning strategies that present the greatest opportunities to reduce your emissions cost and energy consumption.

And so what I'm going to do now is I'll turn it back to our moderator, so that we can actually show you how the tool works and you can hear a real life example from a local jurisdiction of how they use SLOPE.

Elizabeth McNamee: Awesome, thank you so much for that introduction, Shannon. And a quick reminder to our audience to send in any questions you have at [slido.com](https://www.slido.com) with event code hashtag DOE. And we look forward to circling back to those towards the end of the session. With that, I'm now going to pass it over to Dr. Katie Richardson, who's going to provide a demo in just a little bit. But will first introduce us to the example planning use cases that we're going to be stepping through this morning, through the lens of the Atlanta region. So Katie, happy to turn it over to you.

Katie Richardson: Thanks so much, Elizabeth. And I appreciate the introduction to the SLOPE tool for everyone, Shannon. It's a real pleasure collaborating with DOE. I am Katie Richardson, and have been part of the National Renewable Energy Laboratory for four years. It has been our pleasure over the last few months to be collaborating together with the Atlanta Regional Commission. And this is a commission that represents a ten county region in and around Atlanta.

And we have been working directly with Kofi Wakhisi from the commission. He's a planning administrator there, and we've been excited to explore together how SLOPE's tools and resources can be used to examine regional level questions. So we'll go ahead and dive into that example now. But I'd like to start by handing the mic over to Kofi, and letting him sort of explain a little bit how the regional commission is exploring these questions, the things that are on their minds, whether it you know is related to the building sector or equity questions or transportation emissions issues. So, Kofi. Over to you.

Kofi Wakhisi: Thanks, Katie. And if you could go to the next slide, I think I have a few slides just to kind of introduce our metro Atlanta region and some statistics. So you see, what we have here on this slide are some population and employment statistics. Just basically showing a lot of folks that aren't familiar with the Atlanta area don't realize how large our urbanized area is, in terms of square miles, population and employment.

And there's also some projects that we have as part of our long range planning process that we use to help not only in

transportation but in land use and in other areas, like natural resources, water quality, water demand, water quantity and other areas that we rely on to make planning decisions. We have 20 counties, so that's a lot.

And then within those 20 counties, we have over 100 municipalities that we coordinate and work with to set regional policy and implement our infrastructure improvements and other policies. We also are designated through the Clean Air Act as a nonattainment area for ozone. We were also previously designated as nonattainment for particulate matter. But have since given the changes in the rules are now attaining that particulate, I'm sorry, that pollutant.

And then, one of the things that I mentioned in terms of particulate matter, we've found through our research and analysis over the last several years that there's a disparity in terms of exposure to particulate matter. So even though we are not considered nonattainment, or we are considered attainment for particulate matter emissions in the Atlanta area, there's still a sort of ground level issue in certain areas around the region. Next slide.

And so as it relates to carbon reduction or greenhouse gas reduction, these are some of the main questions we're looking at now. Of course there's going to be other questions, and derivative questions, because of course as a planner we like answering questions with more questions. Because we never get to the end. We're always striving to improve our quality in the region. But specific to energy use, one of my rules as a transportation planner is to determine, help the region determine how to leverage technology to improve emissions from transportation uses.

And not only technology, but what are the policies that we can think about and implement to also help. And that has a lot to do with just overall travel demands. How do we travel? What other modes can we use besides a single occupant vehicle that's gas powered, to travel? So we're exploring those as technology comes more in line. We're also very, very focused and concerned about the impacts of energy inequity to our communities in the Atlanta region. And so that includes the built environment.

And we have folks in our community development group and our natural resources group at ARC who are thinking about those questions and helping us identify ways to complement what we're doing on the transportation side with energy policies that help equity on the built environment side. And then, like I mentioned

earlier, what are some of the best strategies to reduce GHG emissions in the region. And I'll talk about some of the new federal policy that's come online, will be online soon, in a minute. Next slide.

Okay, so when it's specific to transportation electrification, many of you may be aware of the bipartisan infrastructure law that includes a lot of funding. I think roughly between \$400 and \$600 billion over five years for various infrastructure improvements, planning and design and such. But specific to electrification, in Georgia we're fortunate to have \$115 at our disposal to implement and deploy electrification charging infrastructure. And so, that's something that is underway.

Our state and every other state, it was just announced yesterday that every state met the deadline to submit a state electrification plan to the secretary of DOT, USDOT by August first. And of course, Georgia did that. And so that's going to set the tone for how we deploy that \$115 million in our state. We will be, in addition to the state plan, ARC will be commencing on a region wide study to look at how we design, deploy electrification infrastructure within our region to kind of help accelerate the equitable adoption of EV infrastructure, meaning electric vehicles and equitable access to electric vehicle charging infrastructure.

And by the way, I mentioned earlier our you know, one of our goals is to reduce SOV travel. So right now, we're roughly, about half of all the trips we make in the Atlanta region, just over half of them are through single occupant vehicle. We would like to lower that number quite a bit, because that will go a long way whether we electrify or not in reducing GHG emissions. Katie, I think, or maybe there might be one more slide. But I think that's it. And then I'll turn it back over to you to give us a demo of the SLOPE tool, because that's one of the tools that we're using to help identify some policy questions and answer those policy questions.

Katie Richardson: Fantastic, Kofi, I really appreciate the context for everyone. I'll go ahead and share my screen here. Here we are. Hopefully folks can see here the SLOPE home page. And feel free to follow along. If you go to maps.nrel.gov/slope, you can follow along with me and enter the jurisdiction that you might be thinking about in the back of your mind as we go through this example for the Atlanta Regional Commission.

So on the homepage, you can see here there's information about how to use SLOPE. You can set up an account. There's a great

tutorial video as well. Lots of resources that you can dive into. But I'd like to start with the equity questions that Kofi was posing, because this is some new data that we have available on our Data Viewer tab. So if you click on that Data Viewer tab, you can see on the left hand side the layer database pops up. And there are I think we're counting up to 47 data sets now, on SLOPE. So there's so much here to explore. All those planning questions that you might have in mind, please take some time to dig in and see what's available that might be relevant to you.

I'll go ahead and start by showcasing these energy and environmental justice data sets that are new to our platform as of spring. And I'll start with the social vulnerability index. This is the CDC's SEI index, and there's an overall index that you can take a look at. And if you are following along and you want to select an area that you're interested in, you can just type in at the county level the area that you're interested in. And you know what, I'm just going to pop up again so that you can see this a little better. As you type in your county it will zoom in. Zoom in so that you can sort of see what's happening here.

So here we have Fulton County. And as you click on various counties, and in fact you know the Atlanta Regional Commission being a regional entity, they have ten counties that you might be looking at and exploring. And as you click on the counties, you can see the overall percentile ranking of this vulnerability index, which is ranked across counties in the county. And so this shows that Fulton, which is the home of Atlanta, is at the 53-ish percentile ranking for vulnerability.

And then that's broken out by a variety of different metrics here on the right hand side. So, for housing type and transportation, you see that the county is actually experiencing some vulnerability that ranks it in the sort of top quintile across the country for this housing type and transportation. And if you hover over the legend in this case, you can see what the CDC constitutes in groups in that vulnerability category.

So, multi-unit structures, mobile homes, crowding, not having a vehicle, group quarters, are all things that on a social vulnerability index, Fulton County is experiencing. I'd definitely like to share with everyone that at the top of the page for any one of the layers within the data viewer, there's more information about how to interpret what you're looking at. And in particular, if you're curious about where the data comes from, any methodology questions, you'll find links in this section that you can follow and

discover more about the data. There's also the ability to download the data as well as copying the URL and sharing this with your colleagues or any stakeholders or decisionmakers that you're wanting to loop in.

You'll also have the ability, if you will, I think we all live in this virtual world, to screenshot and grab this information, and drop it into any presentations that you might be thinking about. Or using this data to support grant applications and that kind of thing. So any proposals that you might be putting together. We find that SLOPE data is often used by state and local governments and regional planning organizations in that fashion as well.

So I'll just go ahead and pause here and ask Kofi how you're thinking about some of this SVI data. And actually before I pass it over to you, I didn't have a chance to share. But we do actually have this data at the census tract level, which we all know how energy justice issues are so important from a locality perspective. And I'll just sort of Zoom in here a little bit. And you can in fact click on individual census tracts. Let's see, I haven't gotten too close to Atlanta here.

There we go. We'll just pick on some census tract. But what's interesting I think about looking at the data at this level is that you really end up sort of seeing the fingerprint of communities. And we all understand how important that is at a granular level, to begin thinking about your planning and where there might be particular types of vulnerability experienced by communities. So as you think about your stakeholder engagement, this can be sort of a really helpful tool as you begin to work together with communities on the ground. So Kofi, any reflections on social vulnerability for the Atlanta regional area?

Kofi Wakhisi:

You know, as part of our overall transportation planning process, we always are focusing on these types of areas within our region, where we find that the burdens of our transportation system and other infrastructure are you know, disparate relative to other census tracts or other areas, small areas in our region. One of the things that we at ARC do in addition to conducting an analysis like this where we locate these areas, is identifying ways to improve our community outreach and feedback and engagement.

That's been one of the biggest challenges, and one of the things that we are actually going to do in the very near future, in tandem with a lot of the other planning initiatives like the regional electrification plan is develop a more robust community

engagement strategy to reach out to communities and residents in these areas to try to help you know, with the onset of technology, electrification, clean energy, clean buildings. There, we find education is still one of our top priorities and objectives in terms of increasing awareness of the opportunities of all this.

So I think as we move forward and relative specifically to the bipartisan infrastructure law, we'll even be required, and local governments will be required to speak to how investment will improve folks in these communities. And that's a calling from the executive order, from President Biden, which is known as the Justice 40 Initiative.

Katie Richardson: Thanks so much, Kofi. I think that's a perfect setup to dive into the next environmental and energy justice metric that we have available. And this is the household energy and transportation burden layer. So if you go to that layer database, you can click on over to this additional set of information. And we do have that data available, both the census tract level as well as at the county level. So for any of the data sets available on that Data Viewer, you can click this bullet map icon, and you can see what jurisdiction levels are available for that particular set of information.

Here we have energy burden and transportation burden mapped as a by variant map. If you're not familiar with burden metrics, this is really the percent of a household's income that they're spending on either energy bills for their house or in the case of transportation, on those costs related to transportation. You'll see sort of this legend at the bottom where one axis shows the degree of housing energy burden, and then that other axis shows that transportation burden.

So you can see here in the Atlanta region that there really is quite a bit of variability. There's some census tracts where we see very high housing energy burden. And in fact, any number above 6% is considered in the literature as a high burden. So, here's a tract in the area that is experiencing that higher percent of a household's income being spent on energy bills. So this might inform targets for you know, when we look at the built environment and energy efficiency programs, right? What could be done in these communities.

On the other hand, there are other census tracts in the region that are experiencing not just high energy burden, but also in the top third of transportation burdens in the community as well, as you see denoted by this darker purple color. So this is a great set of

information to begin thinking through, how are we going to identify the impacts of our programs and answer that executive order that Kofi mentioned. But also, think through charging station locations, and any other element of the clean energy transition sort of put in context to this energy justice perspective. Kofi, do you have any reflections for us on this data layer of the burdens?

Kofi Wakhisi:

Yeah, two comments here. First is part of that engagement would hopefully help prompt some follow-up activity at the community level. For example, maybe encouraging residents to conduct energy audits in these particular areas for their homes and/or buildings. And then the other that's interesting, because the other point to make here specific to Atlanta, and this very community that you have highlighted, is our main transit, public transit provider, MARTA, is looking at improving transit capacity in this corridor that would ultimately help lower the transportation burden for residents and employees that come and go through this corridor, or this area.

And so they're looking at a BRT project right now, the MARTA board just approved a locally preferred alternative that includes bus rapid transit or BRT along one of the corridors through here, to kind of help improve that. So those are two recent developments, or initiatives, that I think would apply to this area, and how as ARC, how we're looking at addressing both household and transportation burdens.

Katie Richardson:

Fantastic. And as it relates to your energy audit comment, I'd like to briefly just showcase the low to moderate income single family home build savings potential layer. This layer is available down to the county level, across the United States. And again, you can type in the jurisdiction you're interested in and the map will zoom in here, as you see. And this is a data layer that's built on the ResStock model from DOE that's conducted by NREL.

And what that really is, is a set of computer modeling that looks at average you know, homes in that particular county and asks the question, if we were going to conduct an energy audit, what is likely to be the most cost-effective set of energy efficiency measures that would be recommended for that particular home to adopt. And based on that analysis, we find that a potential as much as 41% of energy bill costs for these LMI households could be saved if that ideal energy package were to be adopted.

And what that translates into roughly is, an electricity bill, a \$485 savings for these households, in their pockets. I really, really love

this graph, because I think it's a great communication tool. People understand what a dollar in a family's pocket means on an annual basis. And I think that's a compelling argument for those energy audits that Kofi was talking about. So Kofi, any thoughts here before we switch briefly to the Scenario Planner?

Kofi Wakhisi:

No, well, I will say that one of the things that just in general we do at ARC is pass down federal funding, federal transportation funding, to local governments to do more detailed in-depth engagement and planning for vulnerable communities in areas that are often facing extreme poverty. And so, that's one of the ways we're looking at furthering a conversation and having developed more specific context-sensitive recommendations for improving quality of life in those areas.

Katie Richardson:

Great, thanks so much. So we'll go ahead and switch over now to the second half of the SLOPE platform, which is the Scenario Planner. And I saw a question in the chat earlier that asked where does this data come from, for the Scenario Planner? And this is really an analysis that is built on the backbone of five models of NREL's that were conducted by the DOE as well as two standard scenario studies.

And together, that information is incorporated across these sectors, transportation, residential, commercial, industrial. And is considered on both the supply side and the demand side of the energy equation. So we're really, really excited to have this scenario planner available. It provides you an incredible tool to explore information from your community. So again, the way this works is on the left hand side, there's a control panel. And you can type in at the county level, if you like.

Take a sort of look at, let's see, I need to start at reference here. Take a look at your information. This first set of options in the control panel is the metric on which you're wanting to examine your problems. So perhaps you're interested in energy consumption. You can also look at carbon emissions, as well as system costs at the state level.

On the right hand side, if we close up the control panel, we see a chart which really sector by sector says here's what the energy consumption needs are for this county, both in the natural gas side of the equation, transportation and electricity, and includes gasoline emissions from conventional vehicles. And then as well on the electricity sector. So the emissions that are coming from buildings and from the power sector supporting those buildings.

As you sort of scroll down, there's information in this chart, as you can sort of slide year to year here. And these numbers in the table will change. You can also download the information in this chart using this button here. And if you scroll all the way to the bottom, there's a set of information that our tracking at the state level, technologies under the circumstance of this reference case which is just a business as usual projection of what's going to happen in the supply and demand side for Fulton County in 2050. And so here you see in a business as usual case, maybe only 11% of vehicles on the road, light duty vehicles, would be electric vehicles.

We can also look using the control panel, let's go ahead and switch our metric to carbon emissions. And you can see some bumpiness here, some adoption of different types of power sector generation facilities in the area. And what we discover in fact is that based on the projections of the different ways that we're going to supply energy to this area in a business as usual case, there will be as much as a 22% reduction in emissions over you know, 2050 over 2020. So that's something you can sort of calculate using this data.

However, you know, I know that Kofi's sort of spearheading the effort to look at the transition to electric vehicles. So he might want to go into this case, and looking at the demand side, we have the opportunity to choose a high level of electrification for the county. And so this considers both electrification of buildings, so switching over heating needs from natural gas as well as electrification of the transportation sector.

You can find that information in this question mark, or if you would like you can dive into the methodology as well of the scenario planner. But you can see the decrease in emissions really sort of kicking in as these conventional vehicles come off the road and transition instead to being served by the grid. And since that grid is not 100% green in this case, you do get some emissions from those electric vehicles as well. You can in fact layer the options, if you wanted to look at a greener grid as well. I wanted to point that out.

And you can also, I'm just going really fast because I know we're running a little bit behind time. But we can also take a look at a side by side comparison. And here you have widespread electrification on the left, and then that reference case on the right. So you can see the impacts of that additional, there's additional vehicles on the grid. Here on the bottom, that planning metrics, we

now see in 2050 84% of vehicles on the road might be electric vehicles in this high electrification scenario.

So that begins to inform Kofi about what range of possibilities he might need to prepare for, as he begins to look at the interrelationship between emissions and you know, vehicle adoption in charging units as well. So with that, I'll go ahead and hand it back over to Kofi to share any final reflections with the group.

Kofi Wakhisi:

Thanks, Katie. So just I would say being an end user of the SLOPE data tool, especially the scenario planner module, it really streamlines what I would say is a plethora of data into sort of like a decision-making tool, or at least an analysis tool that helps set up the framework to make decisions on how to set targets and goals for achieving electrification, for example, and how that, and what the impacts are going to be to our GHG emissions.

I would point out, and I think we have a link that we can post in the chat, that federal highway just proposed, or announced a notice of proposed rulemaking for states and urban areas, aka MPOs, metropolitan planning organizations like ARC, to set targets for reducing greenhouse gas emissions on the national highway system. It's actually a mandate to reduce carbon dioxide emissions. And state DOTs would establish a two and four year statewide emissions reduction target. MPOs would establish a four year emissions reduction targets for our planning, metropolitan planning area.

And we'll be required to report on these metrics every so often. I think it's, I can't remember if it's every two years that we'd require state DOTs and MPOs would have to report on those. But how do you even go about setting the targets realistically? And that's where the SLOPE tool comes in. So we're very fortunate, and I think the timing and the stars are aligning for us to get further along in our decision-making at the state and regional levels for achieving this rule. This rule will be out until October, mid-October, I think October 13.

So if anybody's interested in reading the rule, go ahead and click on a link. And of course for the highways accepting public comments until October 13. So that covers it. Of course there's more I could say and rave about the SLOPE tool, but I know we're short on time, and there's probably some Q&A that we want to get to.

Elizabeth McNamee: Awesome. Thank you so much, Kofi and Katie, for sharing those really illustrative examples of how SLOPE data can support regional planning. And I'll just reiterate that the examples Katie and Kofi went over, just a couple of planning applications that SLOPE has. There's so much more data on the platform that we really encourage folks to explore that can help with an even wider variety of planning interests.

So with that, we're going to transition to Q&A now. If you haven't already, please join us over on slido.com with the event code hashtag DOE to submit and upvote questions. So I've taken a look at the questions submitted so far. I think we have some recurring themes here, so I'm just going to touch on the ones that seem most popular. The first, the most popular question, where is the data on the scenario planner coming from? And Katie touched on this a bit, but there are really so many different underlying sources, from the national labs, from DOE, and other sources that are really integrated together in the scenario planner.

And that's really why we think it's such a powerful and innovative tool. There is a link to the methodology that is posted in response to the questions. So definitely if you're interested in learning a bit more about those underlying resources and assumptions, we definitely encourage folks to check that out. But just a few of the underlying resources include standard scenarios, electrification future study, the annual energy outlook from EIA and plenty of other resources. So, definitely would send folks to the methodology if you're interested in diving in deeper.

All right, moving on to some of our next questions are really about, or seem to be getting at what types of jurisdictions data is available for, is it available for tribes, communities in Alaska, rural communities, and things like that. So, just to start there, I would share that the reason SLOPE's data is resolved at these different levels is just because again, we're pulling from so many different data sources. So some of the underlying data doesn't have data provided down to the city level always or for certain communities.

But I would say that on the Data Viewer, SLOPE's data is available at the state level, county level, city level, and/or census tract level depending on the jurisdiction. And for the Scenario Planner, I would say we have scenarios available for the U.S. as a whole, and also states and counties. But often we've found you know, for folks at the cities, that they're interested in using the scenario planner. Folks are able to kind of often use a county as a proxy for their city.

Another question on this topic, does DOE incorporate data from tribes into the SLOPE? Unfortunately, we don't have tribal specific boundaries or jurisdictions resolved at this time. That's something we are definitely interested in doing in the future if the opportunity arises. But if folks are kind of aware of the tribal jurisdiction boundaries, you know, folks can always download data from SLOPE and kind of try to aggregate together from different counties to create proxies of what tribal data might look like.

[Inaudible, crosstalk]

Yes, please Katie.

Katie Richardson: Sorry, Elizabeth. I wanted to just highlight in the chat and the Zoom chat, there's another resources as well that those interested in tribal boundaries, I'd encourage you to check out as well, in addition to aggregating information on SLOPE on a county by county basis, the tribal energy atlas is a tool that NREL has developed for the Department of Energy's Office of Indian Energy.

Lots of information there, including some you know, sense of where generation facilities exist, where transmission lines are, that might help support tribes in thinking about siting utility scale projects and thinking through how they might be able to participate fully in the economic opportunity of utility scale solar and other projects. So, lots over at the tribal energy atlas and another great tool to take a look at.

Elizabeth McNamee: Thank you so much, Katie. That's a great plug, and yeah, definitely reinforced encouraging folks interested in tribes to check out that tool as well. I think the last comment I have on kind of data resolution in terms of geography in response to the question of slope represents rural communities. The answer to that is yes, SLOPE is mapped across the U.S. and even our city level data I believe goes down to cities up to 2500 in population. So you get fairly small towns there. But certainly all counties and rural areas and things like that cover those communities as well. Any other comments on data resolution from any of our other panelists? If not, happy to transition to another question.

Katie Richardson: Yeah. Just to jump in quickly. You know, I think philosophically we try to include and provide publicly as much data as we have. There are some limitations to that, so there are some data sets where we don't have information for Alaska or Hawaii. There are many data sets where we do not have information for Puerto Rico.

I see there is a question here, there as well.

However, I do think a couple of our energy justice data sets do have Puerto Rico information for the first time. So take a look at that. That's available for you. You know, we're ultimately just limited by where the modeling and analysis that you know, is the backbone for the data that we share, so we try to include and share with you everything that we possibly can.

Elizabeth McNamee: Thanks so much, Katie. I think we have time for one more question, and I see the next one is does the tool account for grid capacity for electrification or ability to take on new renewable projects. And I'm going to see if Katie has anything to add to this in a second, but just want to flag kind of two features that we weren't able to, didn't have enough time to demonstrate on the scenario planner.

And that is, we have a scenario for folks interested in grid decarbonization that allows folks to turn on and off transmission constraints to kind of see the differences in how transmission constraints can affect CO2 emissions reductions, energy consumption, and costs as well. So Katie's kind of showing us where that is right there. So that's an interesting feature that can kind of give you a sense of how you know, some grid constraints can change outcomes.

And then additionally in the systems cost chart on this scenario planner, I believe there is also kind of a swath in this chart that accounts for distribution and transmission costs as well. So that can hopefully give you, you know, some more information there on grid capacity constraints. Katie, do you have anything to add to that, any more color you can provide?

Katie Richardson: Yeah. I would just say that the, one of the most important modeling capabilities that we have that informs the supply side of this analysis is the tool. And that does definitely take a look at what the capacity is for buildout and market constraints and all of those kinds of considerations that are reflected in that approach from DOE and NREL are then sort of translated into the Scenario Planner. So, really great features that Elizabeth had a chance to showcase here, the transmission constraints and as well as the system cost changes at a state level. So didn't have a chance to dive into that, if anyone has questions I encourage you to reach out. We'd love to hear from you.

Elizabeth McNamee: Awesome. Well, I think that is all the time we have for Q&A today. But thank you everyone so much for all of your questions. If we didn't have time to answer your question today, definitely feel free to resubmit it to our SLOPE e-mail address which will be showing back onscreen in just a couple minutes. Before we wrap up we have two polls to help gauge how we can best support you in your use of SLOPE in the future. So let's first go to our first poll.

So this question is asking how you envision using SLOPE [*break in audio*] climate goal setting. That's great. The scenario planner projections really can help with that significantly and give you some actual potentially attainable targets to set. We also see developing roadmaps to reach goals, communicating with decisionmakers and the public and kind of a fairly even spread here. So this is helpful for us, to help target some of our future assistance and efforts. So thank you for that.

And then happy to move to the final poll question, which is which types of technical assistance are going to be most helpful to support you in your use of SLOPE. So maybe workshops diving into specific clean energy topics would be helpful. A working group to address multiple clean energy topics. Office hours, a SLOPE hotline that would give you quick responses on any questions you have. Customizable fact sheets that you're going to be able to download for your jurisdiction maybe. Or maybe you don't feel like you need any additional assistance at all, and the platform is self-explanatory and you feel ready to dive in.

So right now, it's looking like these small group options seem to be pretty popular to kind of dive into a specific topic or question in a bit more depth. Also seeing good response for customizable fact sheets for jurisdictions. But that a lot of these other ones might be helpful as well. So thank you very much for your input there. We will collect this and use it to target some of our future efforts.

With that, I'm happy to go back to the presentation and wrap up. And so our final request is just to ask the group if you have used SLOPE and are willing to share your experiences with our team, or if you think your jurisdiction would benefit from additional outreach or assistance, please reach out to us at slope@nrel.gov over e-mail so that we can follow up and learn more. Let's go to the next slide.

This webinar is part of the 2022 Better Building summer webinar series. As you can see, we have a great lineup of presentations

through the end of the month. And visit the Better Building solution center to learn more and register. Next slide please. We hope that you'll join us on August 9 for our next webinar title "Why Deep Energy Efficiency Now Matters More Than Ever: An Actual Case Study, Not Just A Theory." Join this webinar to walk through a deep energy efficiency program that is more impactful, permanent and affordable than emissions offsets. Next slide.

Each year DOE releases an annual report with key findings, updates and metrics from the Better Buildings Initiative. Visit the Better Buildings Solutions Center to explore the 2022 progress report and learn more about how DOE and partners are working towards a more energy efficient future. Next slide.

If you're interested in learning more about the topics discussed today, I also encourage everyone to download our additional resources handout from the Zoom chat box. This handout contains links to resources from Better Buildings and our other speakers, and we hope you enjoy that. Next slide.

And then finally I'd just like to thank all of our panelists very much for taking the time today to be with us and to all of our attendees for joining. Feel free to contact our presenters directly with additional questions or if we couldn't get to your question during the Q&A period. And finally I encourage everyone to follow the Better Buildings Initiative on LinkedIn and Twitter for all the latest news.

You can find the handles right next to their respective icons on the left hand side of the slide. And then finally you're going to receive an e-mail notification when today's recording, slides, and transcripts become available on the Better Buildings solution center. Thank you again very much to everyone for joining, and I hope everyone has a great rest of your day.

[End of Audio]

SLOPE: The Toolbox for Planning Your Clean Energy Future

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- [SLOPE Factsheet](#) (*Updated version coming soon*)
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