

Adam Guzzo, Jacqueline Waite, Katie Richardson

Adam Guzzo:

Hello, and welcome. Good afternoon. This is the final installation of the 2021 Better Buildings Summer Webinar Series. In this series, we profile the best practices of Better Buildings Challenge and Alliance partners and other organizations working to improve energy efficiency in buildings. Next slide, please.

My name's Adam Guzzo. I'll be your moderator for today. I have been with the Department of Energy since 2010, advising states and local governments on strategies to maximize energy and cost savings through energy efficiency and renewable energy technologies, programs, and policies. More specifically, I provide technical assistance on energy data management and serve as the project lead for the State and Local Planning for Energy or SLOPE platform, which is the topic of today's webinar. Can go to the next slide.

So here are the items that we're gonna cover during today's webinar. I'll give you an introduction to the State and Local Planning for Energy platform. And from here forward, I'll call that SLOPE. Jacqueline Waite from New Mexico's Energy, Minerals, and Natural Resources Department will provide some background on New Mexico's goals and energy planning needs.

Then we'll hear from Katie Richardson, from the National Renewable Energy Laboratory. She will give a SLOPE demonstration. And then Jacqueline and Katie will show you how SLOPE can be applied specifically in the context of New Mexico to address some of the questions that New Mexico raised as they looked to implement the strategies outlined in their energy roadmap and meet the statewide resource standards outlined in their energy transition act that passed in 2019. And then we'll take your questions and have what I hope will be a beneficial discussion in response to those questions. Next slide, please.

So before we dive into the content, lemme explain how we're gonna handle Q&A. We're gonna be using an interactive platform called Slido for both Q&A and to gather some feedback from you via polls. So if you can, please, go to [Slido.com](https://www.slido.com). Can use either a mobile device or you can open a new window in your Internet browser. And then you'll enter today's events – event code, which is "#DOE." So I'll give you a moment to do that, and as you open that up, just tell you how this is gonna work. So if you wanna ask our panelists any questions, you can submit those, again, through Slido anytime throughout the presentation. We'll be answering your questions near the end of the webinar.

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And then Slido also has this cool feature where you can select the "thumbs up" icon for questions that you like that others have asked. And that'll result in the most popular questions moving to the top of the queue. So that's how we'll handle Q&A. And then we're gonna, like I said, also utilize Slido to initiate a few polls to gather some intel from you. So we appreciate your feedback in advance. You can go to the next slide, which is actually our first poll.

So we can go ahead and launch that poll. You should see now in Slido, again, on your phone or your Internet browser, a poll that pops up. And it'll – we're gonna get – try to get a sense of how familiar you are with SLOPE. So should be able to choose just one of these options here to give us an indication of if you're learning about SLOPE for the first time, or maybe you're more familiar with it and have already used it to support your energy planning or goal setting. So thanks, I see those are already – responses are already coming in.

Not surprisingly, we've got a – quite a few folks that are learning about SLOPE for the first time. That's great. You're in the right place. And hopefully after this webinar, you'll better understand what it is and how it can help meet your energy and climate goals – help support, at least, through its data and information, you and your efforts to meet your energy and climate goals.

So I'll give you guys another ten seconds or so here to respond. Again, looks like the vast majority of folks on the webinar today are learning about SLOPE for the first time, but great to see that we've got some others on the webinar that have heard of it or used it a bit in the past. So that's great. Okay. You can go ahead and close that poll, team, and we'll move on to the next one.

So we've got one more poll for ya, little bit more specific. And this'll help us as we think about which kinds of data to show you within the SLOPE platform. So which of the following data questions does your jurisdiction have? And here, you can select more than one of these options. So we all will be really interested to see – perhaps you're most interested in data on consumption. We've got data about energy efficiency, a lotta data on various renewable energy technologies. In the past, sustainable transportation data has been of great interest. So thanks for providing your responses here.

Yeah. Looks like efficiency right now is winning the race. Got a footrace here between cost of energy and commercial buildings, as

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well. And if we can scroll down a little bit, let's see how the other ones are coming in here. Okay, renewables, always a popular item. Great. Generation scenarios, transportation. I imagine many of you on the webinar are probably interested in many of these, but efficiency continues to lead the way. I work in the efficiency pillar here at DOE, so always happy to see when efficiency gets put first.

Give you another few seconds to respond to this poll, and then we'll move on to the presentation. Great. So efficiency, 80 percent or more here. Consumption. Okay. So when Katie gets into her demonstration of the SLOPE platform, we'll be sure to address where you can find efficiency information as well as data on energy consumption. And then it looks like renewables and cost are third fourth respectively. Great. Thanks very much for the feedback. Marissa, go and close that poll and move back into the slide presentation.

So as I mentioned, the focus of today's presentation is SLOPE. For those that are not familiar with SLOPE, and that's many of you, SLOPE integrates and delivers data on energy deficiency, renewable energy, and sustainable transportation into an easy-to-access online platform to enable data-driven state and local energy planning. SLOPE is a collaboration between the US Department of Energy, nine offices within DOE, and the National Renewable Energy Laboratory, and is designed to support state and local governments and other key energy planning stakeholders in building a hundred percent clean energy economy. SLOPE includes compelling data visualizations like the one you see on this slide so users can explore and better understand the impacts of energy actions and to assist decisionmakers in understanding the various cost-effective options to meet their clean energy and climate goals. As I mentioned, one of the data visualizations here on this screen is the – it's a map, obviously, that showcases our new transportation data that we released earlier this summer. What you see is the light-duty personal vehicle stock projected by county across the United States through year 2020 under a high electrification scenario. And we have this data projected out by state and county through 2050 on SLOPE.

And before we get into a live demonstration, I wanna give you a flavor of the types of questions SLOPE can answer, how some state and local governments are using SLOPE, and the data available in it. So you can go to the next slide, please. So on this slide, these are just a representative sample of questions that SLOPE can help address. You saw in the poll that we touched on many of these topics, consumption, buildings, and others, when we

asked you about what was kinda most top of your mind. So let's just run through a couple examples here. For example, if you wanna know which sectors to target, that will have the biggest impact on reducing energy consumption to support your state or local government's climate goals, SLOPE provides the projected electricity consumption and expenditures for the residential, commercial, and industrial sectors under a business-as-usual case out to 2050. And that data's modeled to the state, county, and city levels. Or perhaps you're interested in encouraging greater investment and development of solar in your jurisdiction, maybe to meet your state or county's renewable energy goal.

SLOPE provides technical generation potential of residential and commercial rooftop PV by county. And you can see how your state or county's PV potential compares to other states or surrounding counties. Or let's say you're considering programs or policies targeting commercial buildings and wanna understand the potential scope and impact of those programs or policies. SLOPE can answer questions like, how many commercial buildings over 20,000 square feet are in my city and what is the total square footage broken down by property type? So you can target certain types of buildings, potentially. So later in the presentation, Jacqueline will walk through the specific questions that New Mexico had, and then Katie will show you how SLOPE helped address those questions. Next slide.

So how are state and local governments using SLOPE? So here's, again, just a few represented examples in addition to New Mexico. You can see Milwaukee is using SLOPE to identify the sectors with the biggest impact on reducing costs and emissions, assess how much of Milwaukee's energy consumption could be met by locally-generated renewable energy, among other things. And we just released a detailed case study, which we call SLOPE Stories, that featured Milwaukee's use of SLOPE. And Katie will show you here what that looks like in a minute. In the case of Maine, it's using SLOPE to levelize cost of energy, data to augment professional energy modeling. And then in Miami, Florida, they're using SLOPE to inform building efficiency ordinances, engaging community outreach and education, and consider future generation planning and coordination with its utility. Next slide, please.

So on this slide, it's a lot of information. I'm not gonna cover all of it. But this is all the data that's currently available on SLOPE. I'll just highlight two datasets for you here today. First, I mentioned that we recently added transportation data to SLOPE, which includes current and projected vehicle registration by fuel type,

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vehicle fuel and electricity consumption, and vehicle miles traveled for personal vehicles projected through 2050. And as I mentioned before, that data is available at the state and county levels.

And then in addition to data on energy generation potential, which we have for 16 types of renewable technologies, SLOPE also has projected electricity costs for 16 generation technologies, plus battery storage. And that's available through 2050 at the state and county levels. We are also planning to deploy additional functionality and add new data over the next six months. So for example, we're planning to add customized scenario planning functionality that can model and visualize the energy system costs and CO2 emissions impacts of various supply and demand side energy scenarios based on user-selected inputs. And we're really excited about delivering that functionality to our users. We also plan to integrate energy and environmental justice data so users can help target clean energy programs and policies to disadvantaged communities.

So hopefully that gives you a high-level flavor for SLOPE to whet your appetite a bit. And on the next slide, I'll introduce our presenters for today. So Katie Richardson from NREL is going to walk through the live demonstration, as I mentioned. She'll show you the capabilities and functionality of SLOPE. But now, it's my pleasure to introduce Jacqueline Waite from New Mexico. So you can go to the next slide.

Jacqueline is a clean energy program manager in the conservation – energy conservation and management division of the New Mexico Energy, Minerals, and Natural Resources Department. She's leading the state's modernization – grid modernization roadmap development process and managing the state's grid modernization grant program. And just prior to coming to state government, Jacqueline was at Oak Ridge Institute for Science and Education, or ORISE, as a postdoctoral fellow, hosted by the US EPA's Re-Powering America's Land program. And she earned her PhD in geography from the University of Maryland. So I'll turn it over to you, Jacqueline, to provide us a bit more context on New Mexico. Thanks very much.

Jacqueline Waite: Thank you, Adam. Thanks for that introduction. Good afternoon, everyone. It's great to be here. It's great to be talking about New Mexico. So could I have the next slide, please?

What I'd like to do is talk about my favorite subject, geography,

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and the population of New Mexico for a bit. New Mexico is ranked 36th in terms of population size, but we are 5th in terms of land area size. And about half of our population is situated around the Albuquerque Metro Area. Another big population center is to the south, in Las Cruces, also in the Rio Grande Valley. And then at the other end of the spectrum, we have about 14 of our 33 counties with a population of 20,000 or less. In many cases, it's much, much less than that. So a lot of rural dispersion of population in the state.

We have – within the state, we have 19 Pueblos, 3 Apache tribes, and part of the Navajo Nation up in the Four Corners area of the state. We also have a great deal of federal land in terms of BLM land, military bases and DoD land, national forests, national monuments, et cetera. And those things make it complicated, although not impossible – but complicated when it comes to citing transmission. We are an energy-producing and exporting state. There're two big – two main areas in the state for energy production. Up in the northwest corner around Farmington, we have fossil fuel production, particularly coal, but also oil and gas. And then in the southeast corner as part of that Permian Basin area, which is – the bulk of which is in Texas, we have some oil and gas, some – especially some new oil and natural gas extraction.

I'll talk a little bit more about our energy transition plan in a minute, but we do have a very large solar potential that we are taking advantage of. We – I think – second only to Arizona in terms of sunny days. And then we do have a – quite a bit of wind potential, especially along the eastern part of the state, where you have that nice temperature and pressure differential between the higher and lower elevations, particularly in the springtime. I think many of you do know that New Mexico has become a go-to spot for filming television and films. And this is all part of our economic diversification initiatives that I'll talk more about next. So could I have the next slide, please?

Again, I work for the Energy, Minerals, and Natural Resources Department. Our objective is to position New Mexico to be a national leader in energy and natural resource management. We have five divisions, and I work for – public-facing divisions, that is, and I work for the first one, the energy conservation and management division, which houses our state energy program. So we work on renewable energy and energy efficiency and alternative transportation programs. We do like to lead by example. So the image here is of the solar array that's on the roof of the building I'm in right now in Santa Fe. We also have an EV charging station, as well as recently, we've added a few solar

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carports to the parking lot. Next slide, please.

So I'll talk about a few of these. I think Adam mentioned in his intro, we have – in 2019, our legislature updated our renewable portfolio standard. Our investor-owned utilities are expected to reach a hundred percent of retail sales from zero carbon or carbon neutral sources by 2045; and our rural co-ops have until 2050 to meet that same goal. We have a grid modernization program that was initiated by this Grid Modernization Roadmap Act that directed our department to create a plan for modernizing our grid so we can do things like electrify our transportation system. The program also – the act also directed us to stand up a grant program so that we can support pilot projects. This year, we revised our sustainable building tax credit program. This was a popular program that we've – this year, we increased the standard – the LEED standard that projects have to qualify for to get the tax credit. And that's for new buildings. And then for existing buildings, it includes some provisions for retrofitting and for appliance upgrades. And that's for residential and commercial buildings.

We have a really popular solar tax credit program. And that is for behind-the-meter projects for individual taxpayers, so residential rooftop solar. It also applies to commercial and agricultural properties owned by the taxpayer. We have a Community Solar Act as of this year. We have our clean fuels and alternative transportation, especially within my division, with our Department of Transportation, working on alternative sustainable transportation options and clean fuels, and then our Clean Energy Diversification Initiative. This last bullet refers to some of the CARES Act funding that we're using to hire folks in my department that will work alongside with our Economic Development Department in diversifying our clean energy sector specifically. Next slide, please.

So this slide essentially just tees up the next part of the conversation. These are kind of the three main areas of focus that we'll be talking about – I'll be talking about with Katie relative to what SLOPE can help us do. So transmission planning and distributed resources, energy efficiency building construction, and adoption of electric vehicles. So I will end that there.

Adam Guzzo:

Great. Thank you, Jacqueline. Really appreciate that. Now it's my pleasure to introduce you to Katie Richardson.

Dr. Katie Richardson serves as the deputy director of NREL

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government relations and also conducts outreach to communities interested in the SLOPE platform. Appreciate that, Katie. She has formerly managed NREL's partnership with Shell GameChanger accelerator for cleantech startups as well as NREL's work and partnership with tribal governments interested in participating in renewable energy markets. Katie holds a doctorate in physics. Katie, take it away and offer us that SLOPE demonstration. Thank you.

Katie Richardson: Thanks so much, Adam, for your kind introduction. It's such a pleasure to work with you and everyone at the Weatherization and Intergovernmental Programs Office at DoE. And thrilled to be able to share with everyone this afternoon a SLOPE demonstration. Can I have screen control, please? And also a big thank you to Jacqueline Weight for joining in our conversation today. Looking forward to sharing the back-and-forth with you, Jacqueline.

I think that you can see my screen now. And what I wanna do to begin is just share an overview of the SLOPE platform and get folks oriented. I know that looked like more than three-fourths of you listening in today, it's your first time getting introduced to SLOPE, so looking forward to sharing this. And in fact, if you go to the URL that was provided in the Slido chat, you can follow along, especially if you have a second monitor available. But here is the main page. This is the landing homepage that you can see via SLOPE.

Lemme see. There we go. And we can scroll here and notice features such as being able to set up your own account, where you can identify – for example, if you're a planner in a city or a county or at the state level, you can set your jurisdiction so that that pops up every time you pull out the tool. You can sync shortcuts and lots of other fun things if you do set up an account. There's also a video. It's about four minutes long. That'll help orient you towards the platform if you're diving into it soon.

There's an About tab I'd like to showcase, as well. Lots of great information here. In particular, if you're – you are incorporating SLOPE data, we encourage you to go ahead and use this citation. And one of the most frequently asked questions, I think, are, what are our data sources and where does this information come from? And if you click on this frequently asked question, you can see links here to all of the different tools, models, scenarios that feed into the SLOPE platform. So feel free to geek out and dive in as deeply as you would like in any of these data sources.

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The heart of the SLOPE tool – platform is available via the Data Viewer tab. So you can see here that there are 42 datasets. If you click on this hamburger sandwich, veggie burger sandwich, you can select which of the data sources you're most interested in. So I saw that quite a few folks are interested in electricity or energy efficiency. And let's see. Let's go ahead and make sure we're all seeing where that's coming from.

So I just clicked on Energy Efficiency, Economic Potential for the state of New Mexico. And what happens is a map will pop up here first. And you can click on whatever state you're interested in. So here's the state of New Mexico. And clicking on the map brings up, in each case of the data, a chart where you can take a look, based on the legend, on the various potential sources of savings, dollar savings in the commercial, industrial, and residential sectors.

And the width of these bands represents some uncertainty in the projections. And in fact, because these are projections, we do, for this dataset, have a timeline slider at the top that you can adjust and see how those potential savings increase in the decades to come. And for each dataset, we also have a pretty detailed text explanation of what assumptions are being made. And of course, again, we encourage everyone to click in to see where that data is coming from and what assumptions are being made.

And I'd also like to orient you to a few important tools. So for any dataset, you can click this icon to download the data. Maybe you're working together with a colleague. You'd like to share information. You can copy the URL here and e-mail that over to a colleague.

And then again, if you set up an account, it's also possible to save a shortcut. You can see that pop up here. You can title it anything you want. And that way, when you log in, you'll be able to pull that shortcut up and save your work as you move along.

So the final thing I'd like to highlight that we're proud of is that we have these SLOPE Stories now available. And if you click on that tab, you can see that we've worked carefully together with the city and county of Milwaukee, Wisconsin, and worked to identify how SLOPE data can address their climate change and economic equity challenges. So if you click in on that story, you can really take a look, read the narrative of how Milwaukee utilized data from the platform. You can see that data load as you sorta scroll through. So we do encourage you to explore that story with Milwaukee.

But for today, we have a sneak peek of the state of New Mexico's

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story. So I will go ahead and turn that over to Jacqueline. Jacqueline, can you share with us some of the questions that the state of New Mexico has been asking? And maybe we can walk through the SLOPE demonstration together.

Jacqueline Waite: Yeah, great. Thanks, Katie. So this – by way of introduction for the first question, given the enthusiasm we have for distributed energy resources, given the challenges around transmission, development, and planning both in-state and with our regional partners, given the fact that there's no multilateral regional market yet for the West – so we're thinking a lot about internal energy production in-state. And then we're also thinking about, of course, energy transition and economic diversification, in particular thinking in terms of those folks up in the northwest who are gonna confront the closure of coal plants and coal mining eventually. And so we're asking SLOPE to consider in this case, what is the potential for local distributed generation and energy efficiency programs to help meet some of the in-state energy needs and minimize the need for transmission and out-of-state resources?

Katie Richardson: Great. Thank you so much, Jacqueline. So to start off here, what I'll demonstrate here is that you wanna click on the Data Viewer. I think to answer the question around distributed generation and how it might be able to meet the electricity needs or generate the electricity needs of the state, we want to know how much energy the state needs. And that goes back to that consumption issue that was popular in the poll. So clicking again on that sandwich, we can scroll down to look at the net electricity and natural gas consumption for the state of New Mexico. And again, you see, by sector, the data pop-up here on the right-hand side. And you can scroll on this timeline if needed.

But you can see that both the commercial, industrial, and residential sectors are consuming a relatively even amount in million BTUs of electricity and natural gas. And so if the state of New Mexico wanted to do a deeper analysis on this data, you can – you can, again, download that data using this button here. And so there's an opportunity, then, to ask the question, what is the distributed generation potential? And in particular, perhaps you might be interested in residential rooftop PV. So I'll select that dataset on the left-hand side here. And for this dataset, you see the residential rooftop PV potential.

So this is considering things like the area of rooftops that are available, but may not sort of incorporate shading from trees and those kind of details, but a maximum potential that could be

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reached on residential rooftop PV. And that's relative to its neighbors. New Mexico may not have as many rooftops even though it is a very, very sunny state. But what we do – what we find when we do an analysis for the state of New Mexico is that it's actually number six in the country for residential PV potential to meet – for the rooftops to meet the potential of the residential demand. And you can see here on the right-hand side all of the different technologies graphed via SLOPE, including here is the residential PV as well as the commercial PV.

This dataset is also available at the county level. So we can sort of zoom in, or, in fact, we can search. So perhaps we wanna look at that Albuquerque area that Jacqueline mentioned. About a million people live here. And you can see that the rooftop potential in a county like this is quite substantial.

Jacqueline also mentioned the Four Corners region as an area that is undergoing an energy transition, with coal plans shutting down. So if we click on San Juan County as an example, we can compare the technical generation potential. And in fact, we find that San Juan's residential buildings can provide more than 75 percent of their energy needs as a total portion of their consumption demand. So fantastic news for San Juan.

If folks are interested, you can also click on Utility PV, and of course any of the other generation technologies that you're interested in. There are quite a few represented here in SLOPE. Overall, we find that solar can meet more than 210 times of the energy needs of the state of New Mexico. So in fact, a very sunny state. Jacqueline, how is the state of New Mexico reflecting on this kind of data from SLOPE?

Jacqueline Waite:

Yeah. I was just thinking about the – economic diversification might involve attracting companies that want to have access – who have green identities, who wanna have access to clean energy either through the utility or produced on their own rooftop. And Facebook, of course, comes to mind. They have a data center in Los Lunas in Valencia County. So I think you can show us Valencia County, maybe, and some of the commercial properties there?

Katie Richardson:

Sure. Thanks, Jacqueline. So pulling up Valencia County here, and switching over maybe to ask the question how commercial buildings, if we're looking to attract commercial partners, will be able to meet energy efficiency and solar needs – so we do have – lemme just do that again to show folks – the commercial building

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sector, we have commercial building count as well as commercial buildings by area. And what's terrific about this dataset, as you see on the right, is that it is broken down by square footage. So if you are considering an ordinance or something like this, you can – you can sort of dive in at the level of building size that you're interested in. For the county of Valencia, that we've pulled up here, and you can see it's labeled at the bottom of the map, we find that there's a significant amount of flex space, of retail space, and industrial space. So lots of rooftop potential to potentially meet commercial partners' needs.

One county to the north, in Bernalillo – lemme just click on that and pick on them again as a major metro area of New Mexico – you see, perhaps not surprisingly, that the multifamily square footage becomes an important part of the picture here. So if you were an energy planner in that county, you might be more focused on the multifamily potential, either for energy efficiency or for rooftop solar or other projects. And I do wanna point out here, as well, since I haven't mentioned it before – let's say you know for sure you're not interested in this industry. You can actually click and turn on and off these datasets. So you can focus in on whatever it is that you are interested in conveying to your partners. So wanted to demonstrate that. But back to you, Jacqueline. How does commercial building area fit into the thinking that New Mexico is having now?

Jacqueline Waite:

Yeah. It certainly is an area, at least those two counties that you've shown, and I'm sure a few others, where we can target our sustainable building tax credit communications and get people interested in some of those retrofits, potentially, in those existing buildings. The other thing that comes to mind, too, is the ability to kind of visualize those multifamily housing units allows the state and other actors to kind of assess the demand we will possibly have for community solar. Now that that law has passed, I think it's probably gonna ramp up pretty quickly once those rules are in place next year. So it's great. I think I'd like to switch to the next question. The – so this has the work – picks up on kind of our work with energy efficiency with buildings and some other programs that particular – particularly serve to help mitigate energy burden in our state. So we're asking the question, what technologies can help support energy affordability for New Mexicans and how do needs differ across rural and urban areas?

Katie Richardson:

Fantastic, Jacqueline. So thank you so much for the question. It's such an important one, to think about how we can address equity issues. I do wanna take a moment to actually introduce folks to a

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slightly different tool that can begin to give us a picture of those energy equity concerns and affordability across the state. There is a tool called the LEAD tool from the Department of Energy. And when you go to the URL shown here, you can select which income model you might be interested in. So just for demonstration purposes here, I'll pick on the federal poverty level. And in fact, this tool can show and map the energy burden for states across the country.

You can see overall, New Mexico is not that heavily energy burdened. So this is the percentage of a family's income that is spent on energy bills, on fuel costs, and other things. However, if you do click on the state, you'll have the opportunity to look at the county or census tract or city level. So just pulling up the counties here for the state of New Mexico with no data being available for the Rio Arriba County at this point, you can see that urban areas like Bernalillo do not suffer heavily from energy burden, but many of the rural counties throughout New Mexico do, throughout the state. And in fact, if you – if you keep scrolling, you can discover a chart here that allows you, as you hover, to see that for those families that are under the federal poverty level, they are spending a total of \$1,645 annually on those energy costs, electricity, natural gas, and other. And in fact, if you switch over to a percentage basis, you can see that for these families, it's up to 16 percent on average of their income being spent on energy needs. So really an opportunity to address the supportability question.

You can also pull up extra features here. Here, I've divided renter occupied versus owner occupied. And you can see that the highest energy burdens of all are these owner-occupied families that are living below that federal poverty level, who spend a total of 18 percent of their income on energy costs and bills. So with that in mind, it provides some context to the information that SLOPE provides on energy efficiency.

So let's switch back to the SLOPE platform and take a look here at energy efficiency opportunities. So we all know how important energy efficiency is. It's towards the top of our menu here. And here is that single-family home electricity *[distorted audio]* savings potential. I'll pull that up. So you can see this data is available at the state level only. If you click on the state of New Mexico, this is fantastic information on the right-hand side that comes up. These are the top ten statewide electricity-saving potentials by measure for single-family homes.

So hovering, we learn, not surprisingly, that just replacing that

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electric furnace to a vertical stack heat pump at wear out provides a significant savings potential for families. We all know how important LED lighting is, drill-and-fill wall insulation, and so forth. This data is also available on SLOPE for fuel savings. And so in this case, looking at how we might be able to save in natural gas, drill-and-fill wall insulation, smart thermostats, those sort of heating considerations like attic insulation, are gonna – and duct ceiling are going to become the most important factors as we consider natural gas savings. So Jacqueline, back to you. How is New Mexico reacting to this information on energy efficiency?

Jacqueline Waite: Yeah. We've been thinking a lot about – especially in terms of grid modernization, upgrades, and things that are gonna be relatively expensive, as we move toward – *[clears throat]* 'scuse me, electrification of other sectors, the concern is that electricity as a fuel source still needs to remain pretty competitive. And we certainly don't want to increase burden that already exists. And then I'm thinking about how especially this piece you're on now, this technology piece, how it complements some of our work. We've actually developed a model. It's called the Financial Resilience through Energy Efficiency. The acronym is FREE.

It's a – it's a DOE-funded project that – where we've been able to model energy efficiency policies at multiple scales, including the county scale. And this, I think, will help us go from kinda the modeling stage to a more specific energy efficiency program where we can kind of rally around the more effective technologies. So really appreciate that. Thank you. Our third question – hope we're doing okay on time. Our third question is about preparing the electric grid for electric vehicles.

Katie Richardson: Yeah. Absolutely. Thanks so much. I mean, it really goes hand-in-hand. How much energy do we – do we need? How can we save on that energy? And then we know, of course, vehicles are really transitioning in this process, in electrifying.

So we are very excited to showcase today the new transportation data that is available via the SLOPE platform. And I will start by highlighting personally-owned, light-duty vehicle stock. And what we have here on the left-hand side is that map, again, of the state of New Mexico. And on the right-hand side, we have, by fuel type, sort of two scenarios outlined. So in the solid line, that's gonna be a reference case here, in each of the colors. And then the dotted line, it'll indicate a high-electrification case. So that sort of gives you sort of a range as a planner to think about what might be the case coming down the road as we see the transformation of this sector

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and how quickly that may take place.

In the high-electrification case for the state of New Mexico, you can see in – if we were to pick on, say, for example, 2030, and the map will change on the left-hand side, we hover here for 2030, you can see that battery electric vehicles may be as many as just shy of about 200,000 of them on the road by 2030. And as we sort of move to the decades beyond, in 2050, perhaps as many as just shy of a million vehicles on the road that are electric vehicles in the state of New Mexico. We can also take a look at what this many vehicles and their charging needs would mean to the electric grid by clicking on the personally-owned, light-vehicle – light-duty vehicle fuel consumption information [*distorted audio*]. And in fact, it's important to note that these datasets are available at the county level [*distorted audio*]. Really helps with planning. So again, I'll pick on that major metropolitan area.

Oh. Here, I'll just zoom in. Okay, there we go. Hopefully folks can see that. Here we are. And you can see that there would be an anticipated point where there would be more potentially electric vehicles on the road than conventional fuel vehicles in the – in the case of a high-electrification scenario, as shown on the chart on the right.

But it's interesting to note that Bernalillo County, if you were to add up all the different electric vehicles you'd expect in 2030, would only account for about 28 percent of the total vehicles. So there are lots of electric vehicles we anticipate throughout the rest of the state. And in fact, I'll just go ahead – Jacqueline had mentioned earlier the san – the Permian Basin in the southeast region of the state, the Eddy County here. And you can see even in these rural counties, there's a significant electricity need that is being produced by these vehicles. And so that could help potentially rural electric co-ops or others assess what planning needs they may have.

I'll go ahead and stop sharing my screen. And if we could bring up a slide, what I'd like to share, just to conclude, is that it's always possible to download this dataset and crunch with your own numbers, reference against your own models. And so here's a – just a simple example where we were able to pull every county in the state of New Mexico and what that electricity demand looks like in 2030. So with that, I'll pass it back to Jacqueline for reactions to the transportation data and any summarizing thoughts you might share on the SLOPE platform.

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Jacqueline Waite: Thanks, Katie. Yeah, having that county breakdown is really helpful. Of course, there are more people, and therefore more vehicles in those urban counties. And – but we need to think about equitable distribution of charging infrastructure.

And people in rural counties may have different motivations for adopting electric vehicles. For example, the drive times are longer. The gasoline burden might be higher. And there's less access to alternative forms of transportation. So lots of things to think about in terms of differentiating our policies, potentially, and certainly communication.

Yeah, just to summarize, I'll talk a little bit about some of the next steps. Thanks, Marissa. So we – I will say the – I think the platform is digestible. It's very well-documented. And I think the visuals give us a way of communicating ideas in an important way. And I think we'll hopefully be able to test some of that out soon.

I also think that the insights gained, like I mentioned, kind of complement some of our policy initiatives and can certainly help us when it comes to advocating on behalf of certain policies, energy efficiency, for example. We do plan to dig a little bit further into the data that NREL has curated for this platform to think about future questions. And I will say it's been great working with the folks at NREL. In particular, Katie has been really collaborative with myself and my colleagues. So just wanna say thank you, Katie.

Adam Guzzo: Great. Thank you, Jacqueline. Thank you, Katie. 'Ppreciate your feedback. Thanks for walking us through how to utilize SLOPE and apply it to some specific questions that New Mexico had. Jacqueline, I'm excited to hear it's been useful to you and look forward to hearing more as you guys dig in further, and hope it continues to be a valuable platform for your planning purposes.

So before we turn to Q&A, we're gonna have two more questions come at you in Slido. Hopefully you're familiar with it by now. So we're gonna do these a little bit more rapid fire. So turn back to Slido. And what we wanna ask you is how you envision using SLOPE. And again, this is an option where you can select multiple choices here.

But a lot of you talked about energy efficiency. It looks like that's gonna be an area where this platform can be informative to you. Community with decision makers, fantastic. Certainly something that we envisioned as we designed this platform in terms of its

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ease-of-use, its ability to download data. There's some questions I see in the Q&A about the ability to copy and utilize the visualizations. So hopefully those features will be helpful in your communication.

I see support transportation planning, as well. Determine or support renewable energy goals, great. Really helpful feedback. I'll give that another couple of seconds here to just give folks a last chance to weigh in. And then we'll move to our fourth poll before we jump into Q&A.

Okay. Let's go ahead and close that and shift to this next poll, where we're gonna ask you a little bit more specifically about new data that would be most valuable for your jurisdiction. So we offered some ideas here in terms of what those datasets could look like. We know that obviously, they're experiencing a transition – an early-stage transition on the transportation front. So lotta folks are interested in EV charging and fuel – alternative fueling stations and the infrastructure associated with supporting that transition.

More demographic data – yeah, I talked earlier on in my remarks about the fact that we're planning to add energy equity and environmental justice related data to our platform. We showcased the data available to you in the LEAD tool. It has a lot of data on demographics as well as energy affordability. So helpful to see what other datasets would be – would be helpful and of interest to you as our primary stakeholders. So thanks for the feedback there.

Yeah, I see some that are interested in more refined renewables in terms of generation potential. Great. If we could scroll down a little bit and just look at these last couple of options? Yeah. So the less interested in residential buildings count compared to some of these others. More city-level data, as well.

Okay. Great. Thank you for the feedback. Okay. Let's close that out and look at now our Q&A section. And we'll try to address as many of these questions as we can in about the next ten minutes before we do a few wrap-up-related things. And I'm just gonna start at the top here.

So Katie, why don't you go ahead and join me back on the screen. And we'll try to jump and address some of these SLOPE- specific platform questions. So the most popular here at the top is how we plan to keep our information sources current, and we're certainly planning to do that. And I've already mentioned we're planning to add some more data, as well. But Katie, anything else that you

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wanna say about that in terms of making sure the platform remains current?

Katie Richardson: Absolutely, Adam. Thanks so much for the question, everyone. We absolutely will be working to keep the data available on this platform current. As I mentioned before in this About page – I guess you can't see my screen right now. But in the About page, there is the availability to identify all of the data sources for SLOPE, and you can take a look at each of them. So basically, as those data sources update, so will SLOPE.

So as one example, the annual technology baseline data is an important component in some portions of our tool. As indicated, that is an annual update that all of those levelized costs of energy will undergo and will be reflected immediately on SLOPE. So again, one example for folks who are interested in the consumption data, the Energy Information Administration has their annual energy outlook. That's some data that is fed into the tool that's updated annually. So certainly as you go along, you can expect SLOPE to reflect the most current data.

Adam Guzzo: Thanks, Katie. And I'll just encourage folks to continue to populate Slido with your questions or upvote those of most interest. So we talked about the data capabilities in terms of – or the functionality, that you can download the data and then manipulate it for purposes – for your purposes. And Katie showed you an example of that. Question about the graphs and whether those can be downloaded, if you can address that, Katie?

Katie Richardson: Yeah. Folks are definitely welcome to copy and share the graphs. We would just encourage you, of course, to provide the citation to the SLOPE platform as you do that. And then certainly feel free – I think it's important to be able to do your own analyses. So download that data, crunch it, change it, create your own graphs. Again, encourage the citation, of course, but we really do want you to be utilizing, manipulating this data for your needs, for your purposes, for your stakeholders, and sharing the word about the work that you're doing.

Adam Guzzo: Yeah, absolutely. And as I mentioned, it was – the platform was designed to try to make those visuals compelling, kinda easy to understand. So we certainly hope that you'll utilize them by copying them outta the – outta the platform itself. This next question about base layers and LIDAR, I think that's maybe one that's a bit more technical in terms of where we might go. I don't think that's something that we currently have planned, but it's

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something that we can certainly talk to our technical team about as a consideration. So thanks for offering that as a – as an idea.

And then a question from Mike about, "Can SLOPE be used to stack clean energy alternatives based on GHG reaction per dollar spent?" And Katie, before I turn to you, I'll just mention that I said earlier, we're talking about developing – we're not talking about. We are going to add scenario planning functionality to SLOPE. And we're really excited about that functionality. It's kinda been the vision of where we want SLOPE to go from the beginning.

And within that context, users will be able to toggle on and off different supply and demand side scenarios. They'll look at different planning metrics, including GHG, which is not one of the planning – or one of the metrics currently in SLOPE. So that's gonna be an addition as part of the scenario planner. Anything you wanna – else you wanna say specifically to this question, Katie?

Katie Richardson: Yeah. Thanks, Adam. We are so excited about developing that scenario planner. It really is the cutting edge of being able to integrate all the information available on renewable energy and energy efficiency and transportation. And the scenarios that can be explored have quite some depth to them, right? Are there constraints on transmission buildout? Are we in a scenario where there's an anticipation that electric vehicles are gonna be adopted quite quickly if there are some policy drivers of that, for example?

So you can toggle these variables on and off, and will be able to explore, as Adam mentioned, via cost and via greenhouse gas emissions as well as just sorta total impact to the electricity or energy needs in gigawatt hours. So together, those three metrics will enable you to get to the heart of the question. I love the question, Mike. Right, that's the metric of interest, isn't it, the GHG reduction per dollar spent? So excited to see how the scenario planner might be used in the wild once we have a chance to launch it. So stay tuned.

Adam Guzzo: Absolutely. Thanks, Katie. Yeah, these next two are sorta back to what we were talking about in terms of functionality and being able to connect to other tools and resources. API – we don't currently have an API for this platform. The LEAD tool, which we talked about, we're in discussions about potentially adding an API for that particular tool. But we don't have one for SLOPE. And I think we mentioned about the capabilities to download the data and manipulate the graphs.

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We don't have the ability currently to embed those graphs into external websites, at least directly from the SLOPE platform. But again, you can copy and utilize those in various ways that you see fit. So hopefully that addresses your question, Jamie. But I think these kinds of questions about the visuals are really helpful 'cause it makes us consider other functionality we may want to consider in the future. So thanks for offering that feedback. Katie, you wanna talk about the granular nature of SLOPE data and what we have as far as both state, county, and city-level data?

Katie Richardson: Absolutely. So as you maybe saw in the demonstration, all the datasets are available at the – at the state level, I believe, all 42 datasets. In many of those cases, we also have data resolved at the county level. And in several others, we have it resolved down to the city level. And so this sort of granularity in jurisdictional planning is hopefully something that you and your stakeholders and colleagues will find useful. There is, in the About page, under "Frequently Asked Questions," a guide to which datasets have which level of granularity. But in each case, it's just based on that background data and what we were able to pull into the SLOPE platform.

So certainly encourage folks to explore at all of those levels. I find the comparison piece of the data analysis so useful to see what your neighbors are doing, what they're looking at, what decision – decisions are being made and how that compares to your state or jurisdiction. So certainly encourage exploration. And I think the jurisdictional level here is part of our – of the SLOPE platform.

Adam Guzzo: Yep. Absolutely. And we – when we share these slides – the slide I presented on earlier about what data is available in SLOPE actually talks about each dataset and the resolution available for that. And if you stay till the end, you'll see a slide on additional resources, which includes our SLOPE fact sheet. That also has a table on the data sources and the resolution of that data.

Let's try to do one more here. It's a more technical question about whether SLOPE can account for improved access or availability of public transit under the transportation scenarios. Katie, is that one that you feel like we can answer here today? Or is that one we need to take back to our team and address with our transportation experts?

Katie Richardson: Yeah. I'm blanking on the name of the tool, there are so many. But there is a tool that NREL has helped support that can help map where charging stations are across your area of interest. Certainly,

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SLOPE, in our new transportation data, can help drive and compel the reason why you would be asking those kinds of questions when it comes public transit that has been electrified. So maybe there's electric bus needs or that kind of thing. But – I'm sorry. The transportation data is for personally-owned, light-duty vehicles. And so that can sort of inform, in some way, the public transit picture, but – I hope – I hope that's helpful.

Adam Guzzo:

Yeah. I think this brings up a great question, which – what we tried to do in SLOPE is provide, in some cases, higher-level planning relevant data. And then in many of – in all of our datasets, and the transportation one included, there's links to other datasets where you can dive deeper into particular areas. So for example, we used the Transportation Energy and Mobility Pathways Options or TEMPO model for our transportation dataset. There's a link to that in the three data layers on transportation, where you can learn more, as well as additional resources on the alternative fuels data center and trans atlas, other resources where you can dive deeper on the transportation question where SLOPE can't address it. 'Cause we recognize it can't answer every single question.

Okay. So with that, from a time perspective, we're gonna have to pause there on Q&A. And I'll just close out with a couple of final polls quickly in Slido, and then just a few quick slides where you can get additional information. So here's just an option for you to tell us about additional features or data you'd like to see incorporated into SLOPE. You can type that directly into the – into the Slido here, so freeform. Love to get your feedback.

And while you do that, I'll just say if you've got other SLOPE-specific questions, you can feel free to e-mail us at SLOPE@NREL.gov. Or certainly, you can reach out to any of the presenters today. And our contact information is provided at the end of the presentation. And I'll just here thank Jacqueline and Katie for their time and their expertise and insights. We really appreciate that.

So I'll leave that open for another moment. I'm not seeing any responses there, but hopefully folks will feel free to e-mail us with additional ideas. Great, there's one. There's a few more. Great. Thanks for the feedback.

And then one final poll here. What types of support would be most helpful to you? And this will help us think through how we can ensure not only that you're aware of SLOPE and its functionality and capabilities through mediums like this, but also other ways that

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we can potentially be helpful in your utilization of SLOPE to support your energy and climate goals and planning needs. So trainings and webinars, great. Very helpful. Certainly doing one of those today, but certainly think about what other ways we can provide training and support around SLOPE.

Case studies – as we mentioned, we've got one in Milwaukee. We've got one coming on New Mexico. So keep an eye out for that one, which should be available soon. We're excited to tell you more about the work we're doing with New Mexico and their use of SLOPE. And then peer exchanges. Great.

Okay. Let's close out that poll, and I'll run through these last couple of slides quickly and try to get you outta here by 4:00. So here's the additional resources. As I mentioned, I called out the SLOPE fact sheet. Also see a link here for the Milwaukee SLOPE story as well as some other resources, some of which we highlighted, like LEAD, others that we didn't explicitly call out, but are maybe relevant. Next slide.

As I mentioned, this is the final webinar in the 2020 Summer Webinar Series. So you'll see we'll be announcing – here's all the webinars. We'll be announcing our 2021/2022 Annual Webinar Series in a few weeks. So we appreciate you spending some – your summer with Better Buildings. And then next slide, you can actually go here to watch recordings from the Better Buildings virtual summit as well as our previous webinars in this series and others. We have technical presentations from labs. So lots of on-demand resources available here.

And then finally, I'd like to again thank our panelists for their time today. And here's our contact information. And feel free to reach out to any of us with questions or if we couldn't get to a question or you didn't get a chance to ask one in the Q&A period. And I'll just encourage you to follow Better Buildings on Twitter. That's where you'll get the latest news. You can also sign up for our e-mail notices on the Better Buildings Solution Center. Be sure to check that out.

So thank you, everyone. It's time for us to close out for the day. But 'ppreciate your time. Hope you have a great rest of your Tuesday and week. Thanks very much.