DOCKETED	
Docket Number:	18-IEPR-08
Project Title:	Energy Equity
TN #:	224288
Document Title:	Transcript of 05302018 Joint Agency Workshop on Clean Energy in Low-Income Multifamily Buildings
Description:	***SUPERSEDES TN 224278***
Filer:	Cody Goldthrite
Organization:	California Energy Commission
Submitter Role:	Commission Staff
Submission Date:	7/24/2018 3:04:57 PM
Docketed Date:	7/24/2018

CALIFORNIA ENERGY COMMISSION

In the Matter of:

Clean Energy in Low-Income)
)
Multifamily Buildings)
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JOINT AGENCY WORKSHOP

CALIFORNIA ENERGY COMMISSION

1516 NINTH STREET

FIRST FLOOR, ART ROSENFELD HEARING ROOM

SACRAMENTO, CALIFORNIA

WEDNESDAY, MAY 30, 2018

10:00 A.M.

Reported by:

Gigi Lastra

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PRESENTERS

Presentation of Context of SB 350 Low-Income Barriers and Implementation Effort

Michael Sokol, California Energy Commission

Presentation on the Current Landscape of Multifamily Sector

Isaac Sevier, Natural Resources Defense Council

Presentation on the Clean Energy in Low-Income Multifamily Building(CLIMB) Action plan

Eugene Lee, California Energy Commission

Presentation on Utilizing Data to Better Understand Multifamily Buildings

Erik Jensen, California Energy Commission

Renee Daigneault, Los Angeles Better Buildings Challenge

APPEARANCES

Panel I

Martha Brooks, Moderator, California Energy Commission,

Stephanie Chen, Greenlining Institute

Meredith Milet, California Department of Public Health

Nancy Sutley, Los Angeles Department of Water and Power

Mary Sutter, Grounded Research and Consulting

Panel II

Mikhail Haramati, Moderator, California Energy Commission

Andrew Brooks, Association for Energy Affordability

Ram Narayanamurthy, Electric Power Research Institute

Dave Brenner, Fresno Housing Authority

Mauro Dresti, Southern California Edison

Alice Stover, MCE Clean Energy

Presentation: Berkeley Convening on Finance

Ted Lamm, UC Berkeley Center for Law, Energy, and the Environment

Panel III-Encouraging Investment and Market Adoption

Eugene Lee, California Energy Commission

Deana Carrillo, California Alternative Energy and Advanced Transportation

Stephanie Wang, California Housing Partnership Corporation

Rich Ciraulo, Mercy Housing

David Hodgins, Sustento Group

APPEARANCES

Panel III (continued)

Lane Jorgensen, MG Properties Group

Recap of Workshop Themes and Areas that Need Additional Feedback

Jeanne Clinton, Former Special Advisor for Energy Efficiency to the Governor's Office and CPUC

PUBLIC COMMENT

Rachel Golden, Sierra Club

Deborah Little (via WebEx written comment)

Nehemiah Stone, Stone Energy Associates

Tom Phillips

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P R O C E E D I N G S

10:03 A.M.

SACRAMENTO, CALIFORNIA, WEDNESDAY, MAY 30, 2018

MS. RAITT: Good morning. Let's go ahead and get started. Welcome to today's 2018 IEPR Joint Agency Workshop on Clean Energy in Low-Income Multifamily Buildings. I'm Heather Raitt, the Program Manager for the IEPR.

I'll go over just a few of our normal housekeeping items.

If there's an emergency and we need to evacuate the building, please follow staff to exit the building, out the doors, and go diagonally across the street to Roosevelt Park.

Please also note that this workshop is being broadcast through our WebEx recording system, WebEx broadcasting system, so it is being recorded, and so we'll have an audio recording posted in about a week, and a written transcript in about a month.

We do have a very full agenda, so I ask our presenters to please stay within your allotted time limits.

There will be an opportunity at the end of the day for public comment, and we'll allow three minutes per person for comments, and first take comments from folks in the room, and then from WebEx participants and folks on the phone lines. If you do -- would like to make a comment, go ahead and fill out a blue card. And you can give it to me or our Public Adviser, who's in the back of the room. And if you're on WebEx, just use your chat function, and just for comments at the very end of the day.

Materials for the meeting are at the entrance to the hearing room, and they're posted on our website. And written comments are welcome and due June 13th. And the notice provides all the information for submitting comments.

And with that, I'll turn it over to Commissioners for opening remarks. Thanks.

COMMISSIONER HOCHSCHILD: Well, thank you, Heather. And thank you all to the stakeholders who are here this morning.

The IEPR is a little bit like the Golden Gate Bridge; as soon as you finish, you start painting it again, and that's kind of how it's been. And I really want to thank Heather and her team.

For those of you in the room today, I do want to note that we're doing the IEPR differently this year. We're doing it in two volumes. Volume 1 was just posted yesterday afternoon. And I would really welcome all of you to take a look at that and provide comments during our two-week public comment period. And that, we're going to get done by September, in time for the International Climate Summit. It tells the story at large of California's clean energy efficiency, clean transportation innovation, and equity policies and what's happening. And then Volume 2 will get done on the normal cycle.

With respect to multifamily, just it's worth noting, you know, we're now in a place where the multifamily is the majority of the new construction happening in the state. It's a really critical sector, particularly with low-income. And both Commissioner McAllister and I had the opportunity in the last few weeks to visit a really impressive multifamily low-income project. I want to thank Isaac Sevier, who is here today, who helped lead that tour.

But with that, we'll get into it.

Commissioner McAllister?

COMMISSIONER MCALLISTER: Well, great. We have a really substantive solid day, so I don't want to take away from all the great presentations and conversation we're going to have. I just want to highlight the importance of multifamily and build on what Commissioner Hochschild just said.

Multifamily housing is really the future of California and our urban areas depend on it. We depend on it to meet our climate and energy goals, but for many, many reasons that really have nothing to do with energy at all. And so it's really a quality of life issue. It's an equity issue. It touches many, many points of policy and just equity and, I would just say, social importance beyond energy and environment. Of course, we're here because of the energy environment angles.

But as a platform for innovation and technology, as well, multifamily is really surging to the fore, so it's just a perfect moment to have this conversation. I think there's so much substance along many, many different axes and many different policy directions that my hope is that we can develop ideas. You know, there's a lot of great thinking going on already and we're going to unify that and sort of bring that together in this room and in the IEPR, but that we can build on it to really create something that becomes obvious that it needs more extensive policy treatment over the next year or two or more.

The code update that you all probably heard about that was adopted a few weeks ago at this Commission focused on single-family for the most part, and low-rise multifamily. And for the next code update, again, this is very timely conversation, for the next code update in 2022, we are going to focus on multifamily, as well as commercial, but we're really going to make a good focus of multifamily. It's overdue.

And so, again, you know, all the technologies that we want, if it's efficiency, if it's renewables, you know, if it's clean transportation, demand response, all of those sort of key pieces of getting to our clean energy future are there, present in earnest, in multifamily housing.

And so I think it's just a really good moment to have this conversation. And I really appreciate everybody being here and contributing your expertise. It's a diverse area. It has all sorts of issues that I -- as I mentioned before. So I think, you know, we'll need all of your -- all of your sleeves rolled up and helping us sort of navigating a good policy path, trying to identify the highest needs and then putting some, really, some resource requirements and some directions going forward on that. So thanks again for being here.

Commissioner Scott?

COMMISSIONER SCOTT: Good morning everyone. And I'm also just delighted to be here and to have the conversations that we have planned for today. We have a really amazing set of panels and panelists to hear from.

I'll just really echo what you heard from Commissioner McAllister in terms of our multifamily buildings here in the state really do sort of have all of the components, especially on clean energy, that we're looking at together, renewables for community solar, those types of things, energy efficiency and how do we really make all of that work together? But then we want to plug in a bunch of electric vehicles into these, as well. And so how do we make sure that as we are trying to make the buildings more efficient, we aren't undercutting or balancing away from wanting to add some plug load by adding in plug-in electric vehicles to those communities?

And then as we're designing them and as we put them together it is, as Commissioner McAllister and Hochschild have mentioned, so much broader than really just the energy component. I mean, we're looking at how do you build smart communities? How are they walkable? How are they bikeable? How are -- is it accessible, making sure people can easily get to where they need to be in a smart way? And some of that, I believe we've got some folks, potentially later today, coming from the Strategic Growth Council, and the Transformative Climate Communities, as well. But when we think about all of this, just a smart design of communities and making sure that our low-income multifamily buildings are really a component of this in terms of the renewables, the energy efficiency, the clean transportation, all of that together.

So I'm very much looking forward to the dialogue today. Thank you.

I'll turn it to Commissioner Douglas.

COMMISSIONER DOUGLAS: Hi. Good morning, everybody. I think we've heard a lot from those on the dais. I agree with the comments. Multifamily really needs to have this level of focus, and I'm really delighted to be here today.

Thank you.

MS. GOLDBERG: Hi. I'm Sandy Goldberg from the California Public Utilities Commission on behalf of Commissioner Cliff Rechtschaffen, who could not be here today.

And the Public Utilities Commission has recently approved new budgets for its multifamily low-income building energy efficiency retrofit program that is called Energy Savings Assistance Program, ESAP. And a major new component of this program is for energy efficiency measures in multifamily building common areas. So we're very hopeful that over the next few years that the new multifamily common area program will be fruitful. And we'll have a lot of lessons that we can learn on what improvements are needed going forward for this activity.

Thank you.

MS. ADEYEYE: Hi everyone. My name is Adenike Adeyeye. I’m an Adviser to Commissioner Guzman Aceves at the California Public Utilities Commissioner, and she’s sorry she couldn’t be here today, but this is a really important issue to her, to our office, because it’s so important to make sure that California’s clean energy transformation actually benefits everyone. And it’s very important to get to the people who are living in multifamily buildings which, as everyone already discussed, is a lot of people in California. Making sure that it gets to low-income multifamily buildings is especially important.

And I just wanted to highlight that Commissioner Guzman Aceves is the assigned Commissioner for the net energy metering proceeding which is mentioned in the Climate Action Plan. And part of that scope includes a Multifamily Affordable Housing Solar Roofs Program. So we’re very excited to see how we can work with other agencies, also work with all the stakeholders who are here, to try to figure out ways to make sure that this transition does actually benefit everyone and does include low-income multifamily housing.

And thank you so much to Heather, to everyone who worked on the Climate Action Plan. It seems like it was a ton of work to do all of this and to put this together, so we appreciate it. I'm looking forward to hearing from everyone today.

MS. RAITT: Great. Okay, so thanks.

So our first speaker is Michael Sokol from the Energy Commission.

MR. SOKOL: All right, good morning everyone. My name is Michael Sokol and I've been serving as the coordinator role for Senate Bill 350 implementation for the Energy Commission. So what I'm going to do is just give a brief recap on sort of the genesis of this Low-income Multifamily Building Action Plan, the Low-Income Barrier Study, and some broader context of SB 350. I will also keep it pretty brief, just so we can jump into the, really, meat of the content today and allow the experts to get into the panel discussions.

So just a quick overview of SB 350. Everyone is likely very familiar with the major goals, the 50 percent renewable energy by 2030, requiring a doubling of energy efficiency savings by 2030, looking at encouraging widespread transportation electrification, you know, wherever possible, all of this with a shift towards reducing greenhouse gas emissions across the energy sector. And then really a key theme throughout all of these requirements and the programs that have been developed in response to those is the need to prioritize benefits for low-income residents and those that live in disadvantaged communities, to make sure that, really, there is an inclusive clean energy economy and that we're addressing those barriers that have historically limited participation.

And so specifically, one of the requirements from SB 350 was the Low-Income Barrier Study. This is something that the Energy Commission was tasked with, looking at the barriers on the energy efficiency and renewable energy side. And the Air Resources Board was tasked with looking at transportation-focused low-income barriers.

Where the Energy Commission published our report in December of 2016, and shortly thereafter the Air Resources Board has put out their report. And I'll get into a little bit of detail about some of the barriers identified throughout this process and some of the recommendations that have taken shape as a result of publication of the study. But the link is there for both reports at the bottom of this page for those that may not be familiar.

Just a high-level flavor of the barriers that were identified in this process, and we'll get into a lot more depth in some of these later today, but you'll notice there's a lot of parallels through the broader Barrier Study, and then the specific Multifamily Action Plan, as well. So looking at the fact that a lot of low-income residents are renters and there's not a high home ownership rate.

Specifically, a lot of the complexity around the multifamily building discussion, which the Barrier Study sort of scratched the surface on, and this Multifamily Building Action Plan really dives in a lot more depth, looking at, you know, not a lot of access to capital and the inability to take on significant new debts to install clean energy measures, often times older buildings that are in need of upgrades, just for structural issues or other issues that may limit the ability to go in and install clean energy. And then also some unique needs for remote or under-served communities that are different than maybe the urban environment where you have some issues with different heating fuels that result in higher costs, or limited access to some of the efficiency programs that are offered.

And so that's kind of the structural barrier category.

There's also some program and policy barriers that were identified that really look on the market delivery side, inconsistent definitions was identified as a key issue, inability to sort of integrate across some of the programs. Really what we're looking at is some siloing issues, and along with those, some data limitations around inconsistent data collected or that hasn't been shared historically or isn't always on the same consistent measures. And then looking at unrecognized non-energy benefits where you look at, often times, some of these energy upgrades result in benefits that are far beyond energy savings or cost savings and can result in quality of life or health and safety improvements.

So that's, again, just the high-level. Please refer to the Barrier Study for more detail on the specific barriers, and we'll hear a lot more about those later today.

But ultimately, as a conclusion, the Barrier Study recommended 12 different high-level actions that could be taken by different actors. And with each of those, there's a number of sub-recommendations, so I'm just going to touch upon a few that are very relevant today.

We have five principle recommendations. And really to address some of those program alignment and coordination-type of issues, the first recommendation was to get a Task Force of state agency representatives up and running. This is something that has now -- there's been lots of coordination behind the scenes for all of the agencies, with one of the deliverables being this Action Plan you see today. And so this has been such a huge collaborative effort. There's probably too many to list here that have contributed, but refer to the Action Plan itself and it has a good list of all those that have chimed in and given good feedback.

One of the sub-recommendations for this Task Force was actually to focus issues specific to multifamily buildings. And so that's really the genesis of where this Action Plan has come from is through this Task Force and the interagency coordination effort.

There's a number of other recommendations that you'll hear echoed throughout the narrative today.

Looking at ways to include low-income customers and different solar offerings including, potentially, community solar programs.

Making sure that we're considering the full range of benefits of sort of clean energy upgrades that include workforce development and education goals and having a comprehensive strategy across the agencies that focuses on that.

Looking at ways to unlock addition access to capital and new financing opportunities that take consideration of the inability to take on new debt or things like, potentially, low credit scores or lack of access to capital.

Looking at ways that across the agencies, we can develop a consistent set of metrics and share data and track things systematically across the whole state and across the various programs that are offered.

And so this is kind of the core set of principle recommendations from the Barriers Study. There were seven additional recommendations. And really, again, there's a lot of meat to these, so I would refer you to the Study to dig into them.

But at a high level, we already talked about expanding opportunities for renewable energy for low-income customers, looking at ways to align tax credits and use some of the information from tax events to align clean energy upgrade opportunities.

Thinking across the programs from more of a customer-oriented approach to a one-stop shop kind of a mechanism. This is relevant, also in the multifamily side, as well, where we heard a lot of feedback on the need for a one-stop shop on the multifamily side, particularly for building owners that often times struggle, not knowing where to go for all these various program offerings.

We want to consider consumer protection, of course. As there's more opportunities, you want to make sure that low-income folks are safe and protected and that there's trust built into the system. So along that same line, working with qualified community-based organizations that know the local communities, know the residents, and sort of have a local trusted voice in the community that can serve as liaison in between some of the state-administered programs and the local needs.

And then, lastly, just a couple of items of looking at ways to align some of our research program offerings to target benefits for low-income and disadvantaged communities. And then looking -- and this was sort of a third requirement of the Barrier Study, is looking at ways to increase small business contracting opportunities in disadvantaged communities.

And so that rounds out the whole list of our 12 recommendations. And I just wanted to mention, too, that this is from the Energy Commission study that released 12 recommendations. The transportation-focused study on the Air Resources Board side also has a range of recommendations, as well. And so both agencies, along with the PUC, along with the whole range of other state agencies have been working closely together to actually implement these recommendations. And so that's -- we'll hear a lot more about some of those steps that have been taken today.

There's a couple I do just want to highlight for folks that may not already be aware. This relates to the Recommendation 5 from our study which is looking at better ways to utilize data and track performance over time. There's an energy equity indicator tracking progress report that the Energy Commission has taken the lead on developing, in coordination with all the others, as well, and lots of public feedback, that looks at tracking progress of four different clean energy programs over time as they are performing in low-income and disadvantaged communities. And this is also serving as a tracking mechanism for implementation of the Barrier Study recommendations.

There is a draft Track Progress Report that's posted right now on the Energy Commission's website. There's the second link you see here, where we had an initial sort of framework paper published last year. There's the draft Tracking Progress itself available now. And we're working towards a final, which should be coming next month.

As we publish this final Tracking Progress Report the idea is to move towards more of an interactive mapping tool that will allow stakeholders to go on it, conduct their own analysis, focus in on different regions, and then, you know, sort of build the picture of what story that they're trying to tell. And then on the static Tracking Progress Report, there will be an annual update, as consistent with our other Tracking Progress Reports that are done here.

I would encourage everyone to go check out the links here and go, you know, familiarize yourself with the system. I think it's a very good start, but there's still additional work to be done to build out the picture, specifically on the multifamily side as we move forward. And we'll hear some about the data limitations and potential actions to move that forward later today.

Another effort that I just wanted to

point folks to that's related to SB 350 implementation is the Joint Agency Public Utilities Commission and Energy Commission Disadvantaged Community Advisory Group. This was a requirement of SB 350. There was a kickoff meeting that was held earlier this year, just a couple of months ago, here in Sacramento. And then going forward, there will be quarterly meetings. But really the intent of this body is to review and provide advice to the agencies on proposed programs and sort of how they are impacting disadvantaged communities to make improvements moving forward.

And so there's, as you can tell, a number of key coordinating bodies and mechanisms to try and really make sure that the Energy Commission, the PUC and other agencies are being responsive to the needs of low-income customers and disadvantaged communities.

Just at a quick high level, the next steps are, you know, we'll continue to coordinate amongst the agencies through this Task Force mechanism, but through, also, meetings like this, key workshops and roundtable discussions, et cetera.

Outside of the interagency coordination, making sure that we're going back out, engaging with communities, understanding what the local needs are, even doing regional outreach, as needed, to make sure that we're, you know, coming to folks, where we realize it's not always possible for everyone to come here in Sacramento and join a workshop like this.

And then like I mentioned, tracking process on the energy equity goals, and also the larger SB 350 goals, many of which are relevant today. So where we have energy equity in the Barrier Study as kind of the genesis of this Action Plan, there's implications for things like the energy efficiency doubling, the renewable energy goal that's here in California, and ultimately towards the decarbonization push that is really a key focus moving forward.

So with that, I will leave it here. And I'm happy to take any questions from Commissioners, or otherwise we'll kind of continue moving through the agenda.

MS. RAITT: Thanks, Mike.

Next is Isaac Sevier from Natural Resources Defense Council.

MR. SEVIER: Hi everyone. Good morning. I want to thank the Commission staff for inviting me to come and speak with you today and share what I believe are some of the most important highlights for us in the room to understand about the state of clean energy and low-income multifamily housing as we kick off the rest of our discussion today.

My name is Isaac Sevier and I work at the Natural Resources Defense Council, which is an international environmental nonprofit group. And specifically, I spend my time building the California network of Energy Efficiency for All, which is a national partnership advancing healthy and affordable energy solutions for under-served renters.

Before I dive in, I want to just note that it would pretty much be impossible for me to really cover the breadth and depth of every clean energy technology with the attention that it deserves. Rather than do a disservice to renewables, energy efficiency, distributed storage and electric vehicles, I chose to keep my remarks at a pretty high level about the state of clean energy in low-income multifamily.

Over the next 15 minutes, I'm going to attempt to do three things. I want to describe what I think is an emergency in motion, as we talk about the widening gap for Californians in terms of clean energy access. While we're on our way to cleaning up our grid and decarbonizing the fifth largest economy in the world, the poorest people among us simply can't access the same benefits that we have. Secondly, I'm going to try to characterize the fundamentals of the multifamily properties that house nearly 18 percent of California households. And last, I'll cover briefly some barriers that are really specific to the building sector and the benefits to be had in overcoming them if we really tackle this effectively.

Today, 40 percent of households in California are low-income. Low-income is defined often for program eligibility as 200 percent of the federal poverty level, which in 2018 for a family of four is $50,000. If you qualify as low-income, you're likely to be also someone who rents your home. Your likely, as we've talked about already, to be living in multifamily housing. And you're also likely to be non-White.

You're likely to be elderly or being -- taking care of someone who is elderly.

And for the purposes of this conversation, it's important to note that you're very likely to face high levels of energy insecurity, which means that you're not just struggling to pay your energy bills but, in fact, you're making tradeoffs between food, housing, medicine and energy. And if not -- if we don't come up with interventions on this, it really produces long-term health outcomes, and I've listed a few here, some of the most serious of which are higher rates of respiratory problems, heart disease. And some of our health friends are even telling us it has severe implications for life expectancy.

Meeting an energy burden in low-income households in California is two times as high as for all households. And I'm showing you a graph that points out what this looks like across six of the largest metropolitan statistical areas here in the state.

So in San Diego, what you're seeing is if you're living in a low-income multifamily household, you're paying four percent of your income for energy, compared to two percent that everybody else pays.

I want to note that this graph doesn't include any information about our communities in the Central Valley because they weren't included in the source study, and this is because they're not part of a metropolitan statistical area. So I think this sort of further highlights the fact that if we rely on some of the known data, we're going to miss out on a large part of our population who are living in even hotter climate zones than our coastal population. And comprehensive approaches and solutions really need to take them into account.

So let's -- that's kind of the human implication of this emergency that described.

I want to talk a little bit about where these folks are living. And remember that we just saw this, 40 percent of Californians have low-incomes, and 44 percent of those households are living in rented multifamily housing, accounting for more than six-and-a-half million people.

So from the chart on the right we can see that it's divided up into -- the classifications are divided up into how many units are in each building. So when we talk about multifamily programs, you'll often see programs that are designed to target buildings with five or more units. Then there are other programs that might address buildings with just two to four units. Together, these make up that 44 percent.

Next, I want to talk about just the vintage of housing that we're talking about. The majority of low-income multifamily housing was built prior to 1980, and these represent the most significant opportunity for envelope (phonetic) and equipment measure upgrade.

So if you're looking at this graph with me, you'll see that five-plus unit buildings, 45 percent were built before 1970, and another 14 percent were built between 1970 and 1974. And you can kind of add up the numbers yourself to see that 80 percent of the five-plus unit properties were built before 1980, and 70 percent of those two- to four-unit properties.

So even, if we look up the scale, we even see that properties that were built around 1990, if we think about where we are today in 2018, we're talking about buildings that are approaching 30 years old. And technologies, as far as energy efficiency and renewables, has changed a lot in that time. And we'll have to make significant investments in a much older stock.

So the ownership of multifamily housing is where it starts to be really complex. And I'll kind of recall for you guys that six percent of multifamily housing is what's called rent assisted, meaning that it's subject to really complex federal requirements. This housing is often owned by either large corporations or by nonprofit groups.

And in contrast, the bulk of market rate low-income housing is owned by individuals. And I want to make a note that this is not market rate in the sense that you can go on Craigslist and see that the rents are kind of comparable to everybody around them, but that they're specifically market rate low-income, which is a term of art that often hides the fact that this housing would be unacceptable if you could just pay more to get out of it.

Well, the main takeaway here is that the ownership structures are very different depending on whether or not you're talking about rent assisted properties or whether you're talking about market rate. And as a result, it's really hard to just paint with one broad brush and say this solution will fit everybody when we talk about the low-income multifamily space. Especially for corporate ownerships in this space, it presents a number of financial barriers that I'll kind of address a little bit later.

I was asked to kind of include this statistic for you that highlights the geographic location of low-income multifamily buildings. Sixty-eight percent of all low-income multifamily housing is in just six counties.

This is just one example of how the state agencies who are tasked with, you know, meeting the goals of SB 350 could think about prioritizing their efforts. But I did a little bit of work and thought, if I waited at all on disadvantaged communities in this, you would actually see the last two counties fall off of this graph, and you would add a lot of our Central Valley communities, including San Bernardino, Kern County, Fresno County, Sacramento and San Joaquin Counties.

But I say this to highlight the fact that it might be easy to say, where are the multifamily buildings? But that doesn't necessarily correspond to where are the energy savings and the energy gains to be had in low-income and multifamily housing.

So, so far I've shown a lot of information just about the building stock, without covering the actual energy efficiency or renewable energy potential that's here. And some of that is just because we don't have as robust studies as we'd like to really evaluate the potential that exists.

But we do know from practice that existing programs are realizing those savings. So the Community Services and Develop Low-Income Weatherization Program has been able to achieve 44 percent energy savings in its low-income multifamily treatments.

Some of that tremendous success is focused -- is because the program is focused on achieving greenhouse gas reductions rather than -- and, thus, can kind of like holistically treat a building rather than splitting up its attention between what's going on in the tenant unit versus in the common area spaces of the building.

Another really promising program that was alluded to earlier on the dais is the Solar on Multifamily Affordable Housing Program, which is going to install 300 megawatts of solar over the next ten years and has been specifically designed to figure out how to deliver benefits, not only to the building owners, but to the tenants first.

I think everyone in the room is probably really familiar with the split incentive problem, which is also described like at length in the SB 350 Barriers Report. And if you're not familiar, the barrier really represents the building owners lack of incentive to invest in housing if they're not seeing a direct benefit. So a question you might hear is why should I, a building owner, try to save my tenants money when I'm not paying their bill and when I don't accrue the benefit of that investment?

Programs like LIWP and SOMAH, which I've already mentioned, are really creatively addressing this problem through providing really robust technical assistance and deliberate design, a design that emphasizes the benefits that are delivered to the whole building and to the tenants.

The utility programs that exist aren't able to address the building holistically because of how they've been designed. So they are tasked with delivering benefits to folks in their units and then, separately, the common areas of those buildings. And this gets into -- or this brings up a problem of metering and how we are able to aggregate the metering data for a building. So if you're a building owner, you might not have access to see just how much energy your residents are consuming. And I believe that the next presentation will get more into this problem for us.

Apart from the split incentive problem, another really significant issue in implementing programs here is addressing the financial -- is addressing the knowledge around programs that are available and incentives available for building owners. And this graph that I'm showing you from the CADMUS study in 2013 shows that a majority of market rate owners and rent assisted owners aren't aware of state programs or utility rebates that are available to them.

And one of the reason, I believe, for this is that there's actually a source of good financing options for them. So it's not that they have just ignored completely the incentives that are available, but that when asked -- when answering this question, they're saying there aren't programs that I can actually take advantage of that I know of.

So the problem can be overcome with good models. And we're seeing that in real-time with the implementation of WYWTH, with the implementation of SOMAH. But it's a problem that's compounded by the fact that these financial barriers are complex.

So earlier I alluded to the fact that the ownership structures for these properties have many different players. And with these several groups of stakeholders, they each hold veto power over financial decisions, and they each have different priorities that they might be trying to accomplish in different ways.

The current knowledge about how to sort of address this is to provide incentives and to provide larger incentives that allow them to skip past the multi-stage approval process. For building owners, the ability to implement some of these programs really comes up front in the planning. If they can't navigate these programs easily and see that the savings are going to be worth even the time that they're investing in walking through them, they might skip them in favor of an easier way to raise revenue, which would be by just raising the rent, instead of focusing on reducing costs.

So I'm really gratified to see everyone in the room today and for the attention from the Commission on this issue because the challenges before us in addressing the expansion of clean energy really get to long-term health benefits. And I think that this is a piece that gets lost sometimes when we talk solely about energy efficiency savings or we talk about access to more solar megawatts.

And I think it's -- what I want to point out here is that there are a lot of experts across different state agencies that are thinking about the built environment and are thinking about the energy savings in a more holistic sense.

So the Oak Ridge National Lab did a study of some of the federal energy efficiency programs and found that when we improve clean energy access, we actually achieve a large number of non-energy benefits. And the majority of those benefits came in the form of health benefits.

So earlier I talked about how folks who are living in low-income and multifamily housing could really benefit from sort of reduced thermal stress, both in heat and cold. They would see massive improvements in quality of life by being more comfortable in their homes. And you see those through improvement in prescription drug adherence, and also a reduced economic need for food assistance.

So today as we continue to hear from terrific experts across the board, I really want to encourage everyone to think about how we can move the status quo forward when we talk about treating low-income families here in California.

The question for me today is not how do we just address the entire multifamily sector, but how do we improve the lives of Californians that are living without adequate incomes that are making those tradeoffs that I mentioned before, the tradeoffs between energy, between housing, food and medicine. And I think that we need to have the courage to commit to putting our best practices to work and drawing across all the knowledge that we have in the room already to set really significant targets in the next IEPR.

We already know that today the sector is vastly under served. And I hope that this Action Plan will take a bold stance on how to change the picture that I've shared with you today.

And now I'll take some questions, if you have them.

COMMISSIONER SCOTT: I had a question for you back on -- oh, my slides don't have -- this one doesn't have a number. It was the ownership of multifamily housing is complex. And you mention the difference between kind of market rate low-income and low-income. Could you tell us just a little bit more about that? It was a definition that you gave and it went by really fast, so I just want to make sure it's clear.

MR. SEVIER: Sure. I think the distinction I was trying to make was between what we often -- that the graph is labeled rent assisted and market rate. And I just didn't want anyone to think that this is market rate in the same way that you might go out and find an apartment on Craigslist, say in the Bay Area, and you'll notice that rent is, you know, $3,000 a month for a shoebox.

We're talking about market rate low-income, which is often really poor conditioned housing, so it's housing that might not be showing up in real estate listings. It's your, you know, friend's cousin's apartment in his back yard that's really his garage; right? It's stuff that is really uninhabitable, but because of the income levels that these folks are at, that's what they're left with.

COMMISSIONER SCOTT: Thank you.

COMMISSIONER HOCHSCHILD: I just wanted you to talk a little bit more about the sub-metering and how significant a challenge that is and what the benefits would be of getting that right.

MR. SEVIER: So I don't want to harp on kind of like the difference between sub-metering and master metering in these buildings, but really note that program design, when meant to address buildings holistically, are able to look at the energy use, both in tenant spaces and in non-tenant spaces, like hallways, water heating, pools or otherwise; right? And that in the way that industrial and utility programs are set up today, they're required to treat them separately. So through better program design, we can achieve the savings that we know are out there because we see them in the Low-Income Weatherization Program. But the issue of that data collection in the current program structure is a big roadblock.

COMMISSIONER HOCHSCHILD: Thank you, Isaac.

All right, should we move on to Eugene Lee?

MS. RAITT: Thanks. So our next speaker is Eugene Lee from the Energy Commission.

MR. LEE: Good morning. My name is Eugene Lee and I'm the Residential Supervisor in Existing Buildings. I currently manage a small but brilliant team of energy avengers, I call them, in the Existing Buildings Office. This is a fabulous piece of work. I'm very proud of this 76-page document. And bear with me as I try to fast forward very quickly of what the contents are.

Today, we'll be walking through the characteristics of the multifamily sector. I'll just breeze through it very quickly because we've already received some excellent information before, as well as the SB 350 implementation.

What is the CLIMB? And what are our goals today, and our next steps?

As we learned, there are three principle segments in the multifamily housing world. We're speaking of the deed restricted, serving low-income households, but we also have a market rate component that is actually two subsets, where they are inhabited by low- and moderate-income households, but also household incomes that are sufficient to meet the rent levels. But nonetheless, it should be recognized that within this housing stock there's probably an overburden, as we all know. And there's probably an overcrowding problem, also, within this segment.

These are some statistics, and recognizing about the energy burden, as well as the households and the age these points were previously made. We'll be talking about coordination quite a bit.

So although the multifamily housing is often deed restricted, I think we need to recognize that, also, you cannot actually deed restrict an energy burden. These households are very challenged.

As Mike explained, the guardrails of this study are fully contained within the SB 350 implementation. It comes out of the Recommendation 1D (phonetic), to actually develop a comprehensive plan focusing on these improving clean energy opportunities.

So what is CLIMB? It's a great acronym. And I wanted to begin with just a quote of a very famous mountain climber, Muhammad Ali, who said this, "It isn't the mountains ahead to climb that wear you out, it's the pebble in your shoe."

Today our discussion is about talking about those pebbles, those obstacles, those things, those irritants that are really preventing us to succeed. You'll see in this slide that multi agencies must collaborate. And this slide recognizes the principle partner agencies that my staff and myself have partnered with and met one on one. This Action Plan the content of participating state departments. And for that reason, that must be recognized.

The trail on this multifamily summit, it's old. It's been traveled by many smart professionals in this room. And it's been evidenced by other research and analysis efforts. This does not dismiss those efforts at all, but in these one-on-one meetings, we have seen renewed enthusiasm for a holistic approach to improving state programs. So instead of siloing programs by agencies, we seek to coordinate and ease that administrative and technical burden for the applicants.

We join together because we have a collective vision of these kind of benefits that, yes, clean energy resources for owners and residents of multifamily buildings needs to be improved, and there are benefits to distributed energy resources. Essentially, CLIMB is a collaborative and a collective vision of these benefits.

Today's purpose of the Climate Action Plan is to identify those early actions to improve those existing programs and lay out those data gathering and collaboration building that we have started to develop those long-term solutions. Our aim is to be adept and very forward-thinking in this Action Plan and to keep climbing.

These are our five trail markers, so to speak, as we climb this, and they're reflected here. We're expanding coordination, recognizing the existing programs that are among us. Do we have a cohesive understanding of the multifamily market? And what are those lessons learned, so that we can recalibrate those existing programs and help us jettison to a future program design, examining very closely about identifying additional resources and the gaps and increasing the outreach awareness and access as previously stated. Allow me to walk through each of these individually.

Expanding the coordination. Our goal is to harmonize the professional voices and to make sense to the implementors and the beneficiaries, so that we understand that there's this coordination barrier. How do we actually qualify? What are the definitions and the language that we use for multifamily, or even low-income? So we leverage our current efforts and we align.

Number two, we're seeking to understand the multifamily market. We're developing, I emphasize, a cohesive understanding of the multifamily market, so that now we're framing ourselves into and statements and no longer either/ors. We're thinking of buildings and behavior, not buildings of behavior. We're connecting the dots. We're gathering data on understanding this multifamily sector.

I spoke of program design. And we're seeking to improve the existing and future program design, understanding that there are statutes and regs and guidelines and policies that bind programs. That's fine. However, our goal is how do we actually make these programs locally impactful, getting to the ground level of effectuating that change? How are these programs limited by geography? How are we examining the respective territories and how they serve disadvantaged communities in extreme climate zones, and those people who are living in those communities and rural areas?

It is a resource problem, so it's identifying the additional resources and the deployment opportunities. And it isn't just a

question of whether there's sufficient resources, but also understanding that we apply resources intelligently to fill the gap. What exactly is the unmet need? Again, we're designing with the and in mind, the
A-N-D. We're looking at triggering events at the time of rescindication of low-income housing tax credit projects. How are we prioritizing the leverage of matched funding where sources are launched and available, but aren't necessarily connected together and woven together? And moving beyond an incremental approach to retrofits.

But education is critical. And our goal is to remove and correct the misunderstandings, the perceptions and biases by providing that education. This is what I call the human element of the Action Plan. And this recognizes and seeks to understand the low-income households and the disadvantaged communities. We understand that 54 percent of the low-income people use a primary language other than English. This is stated in our Barriers Study. How do we train and make a workforce accessible, and that also achieves the goal of consumer protection?

We understand there are challenges. I

think we can all agree in this room about that. We're onboard about coordination. But allow me to emphasize that and ask the question: Exactly what is our vision of what could be in the future? What can be improved? What would it look like?

Today, we are seeking feedback. We have the Action Plan available, but have we considered additional barriers? We have identified strategy timelines. Are they appropriate? Are they aggressive? Are they too relaxed? And allow me to emphasize, how are we -- are we doing enough working with local governments? We understand that state and local leadership, and we need to think statewide but act locally. And engaging in local governments and the local level is necessary in order for us to be successful.

Public comments are due this month on the 13th. Our aim is to finalize the CLIMB Action Plan in August with a results workshop at the end of August, preparing ourselves for September 12th through 14th, the Global Climate Action Summit.

Thank you.

COMMISSIONER MCALLISTER: Thanks very much, Eugene. I wanted, first of all, to thank you and your team. I know this plan is of interest to the Governor's Office and really across the board, and certainly is one of the sort of, I think, visible and important recommendations from the Barriers Study. And, you know, you and your team just jumped to this with full energy and open minds and really a lot of willingness to collaborate and listen, and I think it's reflected in the draft.

Having said that, you know, this is a tough nut to crack, as you've made repeatedly clear. And, you know, we need creativity, we need commitment, and we need long-term energy, really, effort to get there.

Let's see, I wanted to also just bring up, you know, the fact that -- really to exhort everyone here to think about how to prioritize, really focus on concrete steps and help us make this thing better. I mean, your comments are really going to go into a very willing process that, you know, we really want to make this plan better and as concrete and implementable as possible, be able to argue persuasively for the resources that it needs, and so I think that's a team effort. It's not just the Energy Commission sort of putting that on our back and going forward, although that's a big part of it. It's also, you know, whoever we're trying to influence on this needs to hear from multiple parties that have some gravitas and are well informed. And so I think we -- it's, in that sense, also it's a team effort.

I want to point out, just from my own silo here, you all probably know that AB 802 produced a regulatory process that ended up with a benchmarking program for multifamily and commercial buildings above 50,000 square feet. We have regs in place. That program is live and it will require multifamily, medium and large multifamily buildings to do a benchmarking as of June 1 of 2019, okay? 2018 is the commercial requirement, and then a year later, 2019 on June 1, the multifamily requirement. So that's going to produce a beautiful stream of information about our multifamily household stock through Energy Star Portfolio Manager, which many of you may be familiar with.

So, for example, it would be wonderful if stakeholders, you know, you all here and others could put on your thinking caps and say, okay, well, gosh, what could we do with that data? You know, what -- you know, how can we use that data to produce program ideas, to produce good policy, to inform the legislature, to inform us here at the Energy Commission and the Public Utilities Commission, really sort of use it for good. And, you know, the disclosure piece of this comes a year later

So, you know, in 2020 on January 1, all the multifamily building owners that have been subject to the requirement for benchmarking will see their buildings -- you know, essentially look at the map of all these buildings and you'll have a number floating over your building. Well, that's, you know, that's potentially a motivation for some investment in those buildings. Well, how do we leverage that disclosure moment? You know, what does that come along with in terms of outreach and education? What levers can we sort of pull alongside both the disclosure requirement -- or the benchmarking requirement and the subsequent disclosure?

So we want to be impactful. And you all know this market better than we do, and so how can we make sure that we're just pushing in the right ways and in the directions and with the right level of force, you know, carrots and sticks and all that good stuff, so we can get some real results? You know, the econ policy demands it, and also our justice concerns.

So anyway, I wanted to just mostly thank Eugene and the team, but also say that this is a first important step and we really need a better collaboration to make it better, so thanks.

COMMISSIONER HOCHSCHILD: Any other questions of comments for Eugene?

I just want to say, great acronym, CLIMB. We have some terrible acronyms in state governments, and this is -- CLIMB is really well done, so, yeah, I know. All right, thank you, Eugene.

MR. LEE: You're welcome.

MS. RAITT: Thanks. So good segue.

The next presentation is on using data to better understand multifamily buildings, and it's a joint presentation with Erik Jensen of the Energy Commission and Renee Daigneault from Los Angeles Better Buildings Challenge.

MR. JENSEN: Good morning everyone. My name is Erik Jensen. I work here in the Existing

Buildings Unit. I led the development of our benchmarking regulations which went into law on March 1st and I'm working on the implementation of those regulations now. I'm going to talk briefly about Assembly Bill 802, what that did for whole building data access in the state. And I'll talk a little bit about the requirements of the benchmarking regulations. And then someone -- Renee is going to talk specifically about the local benchmarking program that happened at City of Los Angeles.

So Assembly Bill 802 had two -- had a variety of provisions related to energy. There are only two that are relevant in this context. First of all, it required utilities to provide whole building energy use data upon request of a building owner or owner's agent. And we'll get into the specific buildings to which this applies a little later, but this is a big deal. So with a few caveats regarding customer permission, which I can get into later, it definitively says that utilities need to provide energy use data upon request to a building owner, in most cases without requiring individual customer permission. So that's an important step in getting building owners' information about how their buildings are operating.

Secondly, it directed the Energy Commission to create a program for benchmarking and reporting large buildings and publicly disclosing information about those buildings. And so these are two distinct but related provisions.

So covered buildings are the buildings for which utilities are required to provide energy use data upon request. There's no square footage threshold for these buildings, so they can be of any size. And this applies to buildings with no residential utility accounts or five or more residential utility accounts. So again, no square footage threshold. This is the entire set of buildings for which energy use data is required. And again, the building owner, whether it's for participating in the benchmarking program, or for any other reason, the building owner has access to the energy use data.

A subset of covered buildings are disclosable buildings. Those are the buildings for which building owners are required to report to the Energy Commission and for which we will, again, beginning next year start publicly disclosing the data, and those are buildings larger than 50,000 square feet with either no residential utility accounts or 17 or more residential utility accounts.

And let's see, I think I -- there we go. So here are the dates for the reporting and the public disclosure. Commercial reporting began this year. June 1st is the regulatory deadline for that, and that's an annual reporting requirement to the Energy Commission. And public disclosure will begin next year. Residential buildings begin one year later for both. So reporting will start next year and public disclosure will begin in 2020 for the residential buildings.

So this provides sort of two separate levels of information. The first is for the covered buildings, building owners can get their information, participate in efficiency programs or, again, use that information for whatever they want to. For the disclosable buildings, which is the subset of the covered buildings, there will be public disclosure. And so that provides this information to prospective owners, prospective tenants. They can get -- have better information about buildings they're considering purchasing or moving into. It provides -- and so we're really hoping that will sort of motivate the market to improve buildings voluntarily. There are no requirements in this benchmarking program beyond reporting to the Energy Commission.

So some of the local programs often require audits, retrocommissioning, and then even improving the building coming up in New York City, as an example, but this one stops at reporting to the Energy Commission. And so that's -- the data access provision for the covered buildings is what local programs can build upon when they -- if they want to have a local benchmarking program that exceeds the requirements of the state program, and Renee is going to talk about that next.

Here is contact information for me and our program in general. If you've got questions about compliance, what's required, please use the bottom email address there. That's for our hotline. If you've got more sort of policy-type questions or questions about the background of the program, please contact me at the information up above.

And with that, I will hand it over to Renee.

MS. DAIGNEAULT: Okay, good morning. First, I'd like to thank the Commission for the opportunity to share this information. I'm going to be providing some background on the benchmarking ordinance in Los Angeles, which is now in its second year.

So my name is Renee Daigneault. I'm the Program Operations Manager for the L.A. Better Buildings Challenge. And we staff the L.A. Energy and Water Efficiency Resource Center, which is a utility-funded effort to help building owners comply with our ordinance.

So the L.A. ordinance has three main components. It requires annual benchmarking of whole building data. There's also a performance component which starts in 2019. And then there's a public disclosure element, and we've already begun to publicly disclose data from 2016, which was the first year of compliance.

So buildings located in the City of Los Angeles and the LADWP service territory are subject to the L.A. ordinance. There are a few exemptions by building type, and also exemptions by calendar compliance year based on the building status, which are listed on that slide.

When it comes to benchmarking for the L.A. ordinance, there are some specifics that apply. So the benchmarking results will impact the performance requirement that starts, as I said, in 2019. And our ordinance requires that building owners include whole building energy and water data.

And then lastly, our ordinance includes structured, as well as subterranean parking.

So this chart here outlines the performance phase. As you can see, that's sort of a presentation in itself. But essentially, buildings need to either demonstrate that they are already efficient or that they're on a path to efficiency. And if they achieve Energy Star certification, then they are exempt from the energy component of the performance requirements.

The City of L.A. has applied for an exemption from AB 802. So if that is granted, then building owners in L.A. will be just reporting to the city. The city will report onto the state. The City of L.A. is also working with the state to coordinate on a few items I've listed here, the definition of a building exemption, as well as the data transfer process.

So as I mentioned, we already have some data that's available. It's published on Mayor Garcetti's open data platform at the link there. And if you search for EDEWE (phonetic) you'll be able to locate that data set.

This example of displaying benchmarking data comes from Denver. We're looking at all different types of ways to make this data easier for the public to access as we move through future years. And this map actually gives the user the ability to click on a specific dot, each dot is a building, and see more characteristics about that building. So we're looking down the road, as well, to make sure that this data is as easy as possible for people to access and make decisions from.

So next I'm going to cover the resources that we've developed to help owners comply with the ordinance. They're listed here on this slide, and then I'm going to go through a few of them in greater detail.

The main -- the largest resource that we've developed is a benchmarking guide. We worked closely with the utilities, as well as the city, to put this together. So this guide includes screenshots of the entire compliance process. We found Energy Star is not intuitive to people who have not used it before, and so the screenshots are really necessary to get people to a place where they can sit down and complete their compliance themselves.

This is the table of contents from the guide. So just to give you sort of a general outline of what's contained in there, the most sort of critical component for building owners to read through when they read through this is to determine whether or not they have access to whole building data. If they have access to data, they can manually upload it. If they don't, they need to go through the utility request process. So we have specific instructions for each of those scenarios. This is particularly significant for multifamily buildings as the tenants are nearly always billed directly, so the owner does have to go through the data request process in order to report whole building data.

So to help owners comply that don't want to do the benchmarking themselves, we've created a service provider directory. So this includes local vetted third-party vendors that are available to assist owners. Many owners are interested in having a third party provide this service, and so this has been -- this has worked really well in terms of providing that resource to owners that don't have the internal resources to complete the work.

For owners that do want to complete the benchmarking themselves, they refer to -- we refer them to the benchmarking guide. And then after they've uploaded all of their data, we offer a complimentary confidential data review. So what we do during that review is we ensure that the minimum data requirements have been met to comply with the ordinance. We also verify that issues that were identified by the data quality checker were properly resolved. And then lastly, we look at some of the data points in Energy Star that are required to pursue Energy Star certification. That will help the customer in forecasting the performance phase compliance options. So we want to prepare them for Energy Star certification, so they can accurately see where their building is performing.

So for customers that go through the benchmarking guide, maybe decide not to call a service provider and still have questions for us, we have two ways that they can contact us, either by phone or through email. And this is an example -- this is an example of the data flow when customers select the contact us form. So through our website, they complete the form, provide some basic information about the building, and then they select the reason they're requesting assistance.

When they complete that form, they get a custom auto response based on the reason that they've contacted us. So if they're just looking for the reporting link or another piece of -- administrative piece of information, they receive that immediately. And then our staff follows up with them within one business day. The system also generates a case in Salesforce so that we can track each inquiry and make sure that we respond to it and the issue is resolved.

Customers can also contact us by phone.

When they contact us by phone, they get an automated voice response system first, so they'll enter some information about why they're contacting us. We'll direct them to resources. If their resources don't answer the question, then they're able to leave a voicemail which generates a case in Salesforce, and then our staff follows up with them within one business day. We track the outcome of these calls, so that we can see what types of questions and use that information to inform the resources where we want to invest time and effort.

So this slide is intended to outline the importance of determining which stakeholder answers which type of question. Between the utilities, the city, and then our organization, there's a few places that the customers have to go for certain types of inquiries. So it's really important to send the customer to the right place so that they get a response in an efficient time frame.

So to summarize, we're working towards June 1st, 2018. This is our second year of collecting this data, so we have lots of reports coming in this Friday for buildings that are over

50,000 square feet. The performance phase of our ordinance begins in 2019. And really our next phase is to focus on converting the benchmarking interactions that we've had into project discussions, so that we can move further towards the goal of saving energy and water.

So that is the conclusion of my presentation. Our website is located there. Happy to answer any questions. And you can also find all of the resources that I mentioned on our website.

COMMISSIONER MCALLISTER: Oh, yeah. Go ahead.

COMMISSIONER SCOTT: Thank you, Renee. This is great. I had a question for you.

You talked about the benchmarking guide overview and it kind of lists the different things that a person or the building owner needs to do, and also that there's a service provider directory.

Do you have a sense of, if you're a building owner and you get on the page and you're trying to get all this information on your own, how long does that take? Is that like a really big effort for a building owner, or is it something they've mostly got and can just get on there? And then for the third-party vendors, is that something that is a relatively small cost for building owners, or is that something that's a surprisingly large fee? I'd just love to get a sense of that.

MS. DAIGNEAULT: Sure. Sure. And this -- yes, we've got lots of datapoints on this one.

Building owners that are already using Energy Star Portfolio Manager or are familiar with data tracking are able to get in there pretty easily. For the first round of the ordinance, which effected buildings 100,000 square feet or greater, it was relatively easy. Many of those buildings were already being benchmarked.

For buildings that are not -- have never done any benchmarking, what is Energy Star, it is pretty time consuming for people. Many, many times it's because Energy Star has so many options. So they go in and if they're not following the guide closely, they think they have to fill out all of the information comprehensively, which is not required by the ordinance. So we're always referring people back to the guide, saying this is the only information that's required.

So, you know, for people that aren't familiar with this system, it can be time consuming. And a lot of it, is the vocabulary. They're not sure where to look on their bill. It's just sort of a different set of -- different set of guidelines than they've seen before.

And then to answer your questions regarding the service providers, always hard to give any sort of number but, you know, we see around $1,000 per building. Some are a little lower, some are a little greater. Sometimes their packaging that with other types of services. But, you know, it's not $10,000, and it's generally not $300. It's usually about a $1,000, in that range.

COMMISSIONER SCOTT: Thank you.

COMMISSIONER MCALLISTER: I had a comment and a question.

So I guess my question first, really building on what Commissioner Scott said, you know, how much -- so this is a statewide program; right? And I want to give you guys kudos for getting ahead of it. And I think, you know, cities have always been at the forefront of benchmarking, and it really is sort of, naturally, a city-scale thing, certainly, to begin. And we've been able to build on that to make it a statewide effort. And I think -- and that's the first one in the country and that's -- it's, I think, the next natural step.

We definitely don't want to, you know, get in the way of the cities. And then, certainly, you have the ability to go further than say a statewide kind of minimum requirement and can build on it, learn from it and do new and innovative things, which we'll then be able to learn from. So I think that ecosystem is really healthy, just, you know, like we do with building codes and other efforts like that.

So any lessons that you have in sort of the outreach and kind of the education and how many resources you had to dedicate to this as the city, versus kind of counting on, you know, partners out there in the world to help educate the population of building owners that are subject to the requirement. Any sort of learning that might be instructive for us here?

MS. DAIGNEAULT: Sure. Well, the City of L.A. developed a covered buildings list based on data from the County Assessor's Office. So they provided notification to those owners six months in advance. And during the first year, they provided multiple notifications to let people know. So because it's a new program, we did find that the compliance rate is highly correlated to the number or reminders that go out. Sometimes the reminder goes to accounting. Sometimes they say it's something from the city. They don't understand what it is.

So, you know, notifications to covered buildings was really critical, as well as we worked with a lot of partner agencies, so building ownership association, you know, any place where owners congregate, getting the word out there. The official notification is generally where they find out about it, but we also relied on sort of industry partners to spread the word.

And then, you know, working, we created the service provider directory, so working with the consulting community to make sure that they were up to speed and they could provide the service in a meaningful way and actually -- you know, when someone pays a firm to help them be in compliance, we want them to be in compliance, we want them to give accurate information.

So it's certainly an ongoing process. You know, in year two, we're still -- there are some owners that are just complying now, and so they're a year late. So I would say as many communication channels and partners as you can reach out to, and then making sure that notifications to a list of covered buildings was helpful for the City of L.A.

COMMISSIONER HOCHSCHILD: Any other questions? Okay.

Thank you so much.

MS. DAIGNEAULT: Thank you.

MS. RAITT: Thanks, Renee and Erik.

And so next, I'd like to invite our next panel, Program Evaluation and Data on the Multifamily Market to come to the front places where we have places for you.

So just an announcement that, unfortunately, Tami Rasmussen from Evergreen Economics wasn't able to join us today. So the moderator for us is Martha Brooks from the Energy

Commission.

So go ahead, Martha.

MS. BROOK: Good morning, Commissioners and guests from the Public Utilities Commission. My name is Martha Brook. I'm an Adviser to Commissioner McAllister, and I'm moderating this session.

I'm going to ask the panelists to introduce themselves after I introduce the session. And then we're going to ask the panelists a small set of questions that hopefully you'll discuss amongst yourselves with some input from the Commissioners and guests. And then for the remaining part of our panel, we'll ask the workshop attendees to come and ask additional questions or provide information that you have that is relevant to our panel.

So our first panel is on Program Evaluation and Data in the Multifamily Market. And the concept for this panel is that better collection, sharing and aggregation of data are needed to track multifamily buildings, associated GHG emission reductions and other benefits. This includes incorporating building data-driven metrics in the program design, some of the things we heard about this morning, considering non-energy benefits into analysis and cost effectiveness requirements, and just, you know, data needed to plan projects and to identify savings opportunities.

So why don't we just go start with you, Stephanie?

And then I'm going to actually introduce Tami at the end. She did provide slides and talking points, so at least we'll know who Tami is. And she can, hopefully, you know, add her comments into the docket, you know, once she's off of jury duty.

MS. CHEN: Thank you. Thanks, Martha.

Good morning everyone. Okay, slide three. Thank you.

Thanks so much. Thanks, everyone, for joining us today. My name is Stephanie Chen and I direct the energy equity work at the Greenlining Institute. We are a racial justice advocacy organization focused on creating better economic opportunities for communities of color. And, of course, energy efficiency is critical for that, and distributed energy resources overall are critical for achieving economic equity, not just for monthly bill savings, but also for the more intangible, less direct aspects of quality of life that then turn around and lead to either economic success or lack thereof.

(Colloquy between panelists.)

MS. BROOK: Oh, yeah, opening comments would be great.

MS. CHEN: Great. Thanks. So a couple of points that I want us to think about on this topic, one just generally, thinking about how these programs are rolling out in the long term, and thinking about how -- the way that we evaluate programs and the way that we design the metrics by which we're evaluating programs will lead to better program design moving forward. This isn't just a sort of once around the block circle. This is a we're going lap after lap kind of circle.

So I think one of the things that's really important to think about is not -- Eugene talked about buildings and behaviors. And we need not only to track the building metrics, but also the qualitative metrics around behaviors, around straight up customer satisfaction, around how do folks feel about the investments that they've made, that have been made on their behalf? Does it make them more likely to change behaviors, to make additional investments?

As we're thinking about adoption, what's really going to move the needle for low-income folks who are spending disproportionate amounts of their time thinking about all of the different stressors that Isaac was talking about this morning, we really need to make sure that clean energy is a good experience for folks in the things that matter most to them every day, not just in the things that matter most to us every day, which is clean energy. And that's really critically important for low-income folks, particularly in environmental justice communities. But when you're thinking every day about can I afford to pay the bills, can I afford to feed my kids, we've got to meet folks where they're at. And I think that having the right metrics around qualitative customer experiences will help us get there.

And I think the second thing that we really need to consider lies outside of the scope of energy burden and really gets into concerns about rent, and particularly in this housing market, concerns about displacement.

There was a conversation earlier from Isaac’s presentation about the difference between rent restricted or rent assisted low-income properties, and then the market rate low-income properties. And not only are those really, quite frankly, often times substandard housing at cheaper rates, but tenants that are in those properties are constantly at risk of being displaced from those properties when their landlord thinks I could make some more money off of this unit.

So I think that consideration is one that we really need to -- it’s a very narrow needle to thread, but we need to make sure that the benefits that we are delivering are going to low-income tenants, not just to low-income buildings. And those are not going to happen automatically, particularly in this rental climate. So I think that’s one thing that I really want to call on, on the Commissioners, as well as everyone in the room, to think about.

MS. MILET: Hi. Thanks for having me here today. My name is Meredith Milet. I’m an epidemiologist at the California Department of

Public Health. I'm in the Climate Change and Health Equity Program which is in our Office of Health Equity. And I'm coming more from the perspective of co-benefits, specifically health and how we might be able to track those or add that into the data and evaluation component.

So I think that health is being affected by these energy issues in four ways that I see. One is the one that everyone thinks of the most, which is if you switch to clean energy, you improve air quality and that affects health, and that's really important and we should talk about tracking that. But as Isaac brought up, there's one that doesn't get as much play, and that is that there are health benefits from energy efficiency upgrades and programs.

There's a couple national systematic reviews that have shown this, shown the data on that, have shown improved overall health, improved respiratory health, allergies, decreased headaches, improved blood pressure, and better mental health after these types of energy efficiency programs. And the benefits are the greatest among people with preexisting health conditions. And people with low incomes are the most likely to have those preexisting health conditions.

And another way, which was already talked about, is energy insecurity. Like people said a few times, if you're choosing between paying for your energy or for your prescriptions or your healthy food, that is an issue for health.

And lastly, I think there's also, in terms of evaluation of the program in general, if there's an element of workforce development, people being employed, and who might not even be receiving the clean energy, that is still a benefit. If people have employment and have higher incomes and maybe change their poverty status, that has a big benefit for health, as well.

I wanted to spend just a few seconds talking about how Contra Costa County has a pilot program where they're connecting home visiting nurses who are there for health reasons with energy efficiency programs. That seems simple, but it takes effort, you know, to teach those home visiting nurses about the energy efficiency programs and then put a system in place for the people that most need to be referred to programs like LIWP and LIHEAP. And the county is actually giving assistance for that. And Department of Public Health is about to put out a guideline document to help other jurisdictions put together similar programs.

And lastly, I just wanted to say that in terms of data and evaluation, there are a lot of health data out there. There's a lot of limitations to them, but I see that it's really worth exploring.

And there are a few opportunities, and one of those is tracking, and like I said, evaluation, like what can we quantify what have been the health outcomes of these programs? But also, I think there's an ability to try to use these programs as a way to fill a gap in the data. You know, can we try to figure out who are being served and what kind of chronic conditions they have or what are some of the barriers that are getting in the way of doing some of the energy efficiency upgrades that are related to health? Like do they have asbestos or lead paint or mold and they can't get the energy efficiency upgrades? And so those things are addressed.

And that's really the health view.

Nancy?

MS. SUTLEY: Good morning. Nancy Sutley. I'm the Chief Sustainability Officer at the L.A. Department of Water and Power. And I had a couple of slides. I wanted to talk a little bit about our Equity Metrics Data Initiative, which was approved by our board in 2016.

Go to the next slide.

The Equity Metrics is really trying to bring together data that we have, both about our demographics-geographic information and where our programs are to try to understand how everyone across Los Angeles is experiencing our programs. And so we look over a number of different categories of reporting, including some of our customer rebate and customer incentive programs.

And the purpose of this is really to -- not just to report on goals, but also to let us look at, you know, a kind of granular level at how we're doing and help the department to prioritize our efforts and the distribution of our programs across our customer base in a more equitable way, and help us also to understand the effectiveness of our programs, about outreach, qualifications for program participation, customer ease of use, and a whole bunch of other things that we're looking at, and trying to make sure that we understand both the current state of our programs and how we can improve them to make sure that they're more equitable.

So if you go to the next slide, this is just an example of how this data has been reported. This is looking across our customer rebate programs, so a number of different programs overlaid over CalEnviroScreen and at a zip code level. And so you can see program participation across the city, so it's the sense of kind of a heat map to help us understand who is benefitting from our programs and how so that we can better refine our programs and make sure that they're reaching everyone across the city.

So we're continuously updating the data and over a number of measures that we continue to refine that reporting, monitor and measure overall performance, you know, aligned with our metrics targets, and to identify, you know, any places that we can add or modify, establish metrics and make sure that they are tracking what we would like them to track. And then finally, really to, sort of at a policy level, to make adjustments and changes to our programs to ensure that they're reaching everyone across the city in an equitable way.

So, for example, we have funded for a number of years community-based organizations to help us do outreach around our Energy Efficiency and Water Conservation Program. And this year's results of the -- what we've understood is a result of the Equity Metrics Initiative, we've added money in there to ensure that we're targeting underserved communities. So we're looking again across all of our programs to see if we can improve them and to deliver them in a more equitable manner.

MS. SUTTER: Good morning. My name is Mary Sutter. I'm with Grounded Research and Consulting. I was brought in. I think I'm very happy to be here. I have 25 years experience in evaluating energy efficiency programs in California and around the nation.

And so I was sitting here trying to figure out, what is it that I could actually, you know, help folks understand? And I kind of reverted back to this metrics. I think everybody's talked about, you know, what they evaluate, what metrics that they look at. And this may be something that you guys have heard of before, but for me, and the way that when I've thought about evaluation, and especially metrics, there seem to be kind of two flavors. And there's a metric that is perhaps more oversight of a program. It is kind of what I would call the output of a program. It's tracking things, like the number of buildings treated within ESA, or even the percent of disadvantaged community participation. That is something that's saying this program is going in here and causing these changes. These are kind of the touches.

The second kind of metric that I've seen and had people use are outcome metrics. And these are the ones that I've also seen -- policymakers are much more interested in outcomes. They want to know if the things that are happening are making the changes that they expect to see. Those are things like the savings, the energy savings. You know, health changes in this treated population, is it making a difference? If you get treated, are you really going to be seeing some of these changes? It sounds like Meredith is saying, you know, these things are known. And is the energy cost burden that these multifamily homes have being reduced? You know, those are outcome metrics.

I will say, also, when people say metrics, it’s not necessarily a single thing. I tend to break these into kind of four different areas. One is a statement of where is that you’re looking at? We’re looking at buildings treated for this metric. But really, to have a good metric, you have to have a known baseline. You have to say, okay, we are starting here. This is kind of where we’re at. And you also have to have kind of specific targets for change. And those targets have to have a timeline associated with them.

So if you have a metric that doesn’t have a known baseline that doesn’t necessarily have specific targets or have an associated timeline, you may have a metric that’s not going to be as useful for you as you may want.

The other things I would say about metrics is they are best if they have the ability to put their data in context. And I will say that kind of one of the things that Nancy was showing is that it had -- this is where our low-income family reside. And so it allows you to understand whether or not what you're looking at and what is happening is good or bad. An example being if you have as a metric the number of buildings treated, which is sometimes, you know, it is definitely a good metric to understand if a program is doing what it's doing, but you don't know 10,000 buildings is good. Is it good? Is it bad? Is it -- you know, how many are they supposed to be putting in place?

So if you can put that metric in context by having, perhaps, a percent of the population that is being covered. And especially with something like this, to me anyway, if you can do accumulative percent over time, that really helps to understand that we are reaching 40 percent of our buildings, we are reaching 60 percent of our buildings.

And then the last thing I will say as an evaluator, as a person who's been involved with some of these metrics, it's not costless. Really, to put in place a metric and understand and be able to track that over time takes effort. It takes costs. And because of that, I often suggest that you come up with a few metrics that are really important, and they can be proxy for what, you know, types of choices and decisions that you need to make and really put the effort behind those, but not necessarily -- more is not necessarily better.

That's my point.

MS. BROOK: Great, so thank you. That was a great, great introduction to the four of you ladies.

And I'm going to -- I am not going to try to introduce Tami, but she did leave me some slides.

And are you able to pull those up, Heather?

MS. RAITT: Sure.

MS. BROOK: So I just want to introduce this into the panel so that everybody in the room can think about it, just like they've thought about the last few minutes of the introductions. And then, also, there might be some really good reference materials that will follow-up with our comments.

So here's what Tami was going to talk about in her first introduction. It's basically two different studies that Evergreen Economics has been involved in, in like the 2014 to 2016 period. One was an income needs -- Low-Income Needs Assessment, and another one was a Multifamily Processes Evaluation.

This slide here is from the Low-Income Needs Assessment. And I think the takeaway from this slide is low-income is not exclusive to multifamily. There's low-income in single-family rental communities, and there's low-income folks who own single-family buildings. And their energy burden is all -- they're all -- they all have significant energy burden. And, in fact, when you adjust for housing subsidies, medical assistance and things like food stamps, multifamily renters actually look a little bit better than low-income populations that own their own single-family residences.

Those numbers in my like engineering brain all look the same to me. You know, they're 3.9 percent and 4.4 percent, so it's not like huge differences. But I think the point is that we have to be careful when we're thinking about low-income, that we're not just sort of having this silo about multifamily buildings.

So I guess to your point that you already made, we have to talk and think about the people living in these dwellings and their situations, and that's not really siloed into one specific building type.

One of the reasons that these metrics look a little bit differently is that multifamily buildings are different than older, single-family dwellings. They typically use less energy. They're smaller and they're built differently. They don't have attics that have -- you know, that really, basically, generate a lot of cooling load, like the single-family dwellings we've been focused on in the code for the last 20 years. But they still have, you know, significant energy burdens, but there's some variety across this low-income sector.

The next slide please.

Other takeaways from these two studies, the Low-Income Needs Assessment, the needs vary by climate region. So, you know, the low-income in the mountain communities is different than the desert, or to the extent that they can still live along the coast in California, the coastal low-income communities and population groups have unique circumstances. They have -- the focus of these households are broad. They first have to deal with paying their bills, but they are interested in what they can do. And some evidence is out there that says they're very receptive to alerts about usage periods or high rate periods, that they're receptive with energy and education, and that the efficiency of their rental space needs to be put in context of their other housing conditions, which I think a few of you ladies also mentioned.

The multifamily profits evaluation takeaways are -- and I think we're heard this already, at least, you know, my kind of cursory listening skills this morning kind of have tuned into the many programs, many players. And we have to be -- you know, we actually think one of the barrier study requirements was that central clearing house; right? It was just like this dream that you can go to one place and find all your solutions. But especially for this sector, it seems like it's really hard to figure out what the landscape is because of all the different actors.

The data issue we mentioned in terms of accounts versus buildings and trying to understand that sort of whole building, you know, opportunity versus what's appropriate within a dwelling unit.

And then another profits evaluation takeaway is that as the, at least, the investor-owned utility programs move to more and more third-party implementation, there could be opportunities for the multifamily low-income sector that we haven't yet been able to realize.

So I'm going to leave it at that for Tami and Evergreen Economics and hope that they can chime in after their jury duty responsibilities have concluded, and we thank you for your service, Tami.

Let's get to the questions.

So the first question is really general. And when I first read it, I was like, oh boy, I don't think I could answer this question, so I appreciate you guys trying to. And I just want to say that, basically, the question is: What are the best existing sources of multifamily building data and energy saving opportunities that you know of?

And I guess I would ask you to think -- consider a little bit broader than just data. So we've already heard about metrics. We've heard, I think, about information, insights, ideas, all sort of falling into this sort of data bucket. And also to sort of thing more broadly about not just that data fits in a database, and so we're not asking you, where's the database, but also potentially asking you, are there public sources of information? Are there publications you rely on? Are there professionals that you rely on or institutions that you rely on to get some of this sort of foundational data, as you think about opportunities for saving energy and doing clean energy projects in the multifamily sector?

So I'll give you a prize to anyone who wants to start, but I don't actually have a prize. How about a glass of water? I would gladly get it.

MS. SUTLEY: I'll just make a couple of comments.

One, I think, you know, this is an area where we're data rich and information poor. And I think what at least we've tried to do with our equity metrics initiative is really tried to be more deliberate about gathering that data. So, you know, we live in the world of, you know, lots and lots of data about energy and water usage. And also, you know, a lot of expectation, I think, about how we're approaching challenges.

So I think for us it was really having to be sort of very intentional about what we're looking for. And we went through sort of a long, long process of trying to refine the kinds of things that we would track regularly. But we also report lots of different data sets. And you saw earlier about the city's Open Data Initiative, so we also do track a number of different data sets and measures on the Open Data Initiative. So we're a public agency, so really anything that's not sort of customer identifiable is really available to anyone. It's just what you -- what you do with that, and I think it's sort of what the questions you're asking and how you use that information that's really critical.

MS. BROOK: So do you think that -- do you think that's City of L.A. and LADWP territory is unique in its ability to access government data that has probably the sort of baseline data or the, you know, the tracking mechanisms in place already because of its Open Data Initiative? Or do you think that it's pretty general that if you ask if you ask you can find the data you're looking for? The better question is what you should do with the data once you have it?

MS. SUTLEY: Well, I wouldn't want people to have the impression that that was easy to get that data out there. And even, you know, when we've -- we, for example, have provided a lot of customer -- well, a lot of usage data to researchers at UCLA to help compile and energy and sort of water atlas for L.A. County. That took a lot of work. And I think when you start to try to, you know, try to use the data, you find out how hard it is to actually get into a useful form.

So even on the existing Building and Water Efficiency Ordinance, the benchmarking ordinance, it turned out that the City of L.A. doesn't have a standard address protocol that all the departments use. So different departments in the city identified addresses slightly differently, which made some of the data collection challenging, and then trying to match it up with the county's property records.

So there is a lot of work that has to go into making the data useable. And that also, I think, has to be intentional.

MS. BROOK: Any of the other panelists want to chime in on this one?

MS. SUTTER: I'll just say real quick that as a state agency, I see the CEC has to serve, you know, the entire state. And there's a lot of information that might be available in local government. But if you have these multifamily buildings in unincorporated areas in a county, it may be not as available.

The one thing that I -- I was looking into this awhile back. And there is at least one company that I'm aware of that actually takes the property assessment information from all 58 counties and puts it in place so you can just access that data from the player, as opposed to having to go to each individual county to get that information. I actually did not use that person's data, but I have heard that you can separate out single-family from multifamily, but you can't do a very good job of -- you can infer owner versus renter, but it also has the same difficulties that -- you're all nodding up there, so my guess is you've probably heard of this.

But they -- you can't really separate a building which is kind of what you might want to look for, versus all of the various small -- you know, the units within it.

MS. BROOK: Okay. Well, let's move on to the next question, if that's okay. It's sort of more of a targeted, like assuming that you have the information that you need about multifamily buildings and energy saving opportunities, how do you give designers and retrofitters access to the data and information that they need to develop clean energy solutions for apartment buildings?

And a follow-up question on that same topic: How can tenants use the data available to them, like consumption data, to make informed choices about how to save energy, reduce their bills and, you know, do what we want them to do in terms of reducing their consumption? That's the question.

MS. CHEN: I can jump in on the tenant's piece of things. And I think that the key here really is to pair the information about your usage and what's going on today with available solutions; right? And what are the immediate behavioral changes that can be made? What are the free widget that X or Y will send you that you can use to reduce this or that or the other thing. I think making it really as easy as possible, again, going back to all of the different stressors that are present in the everyday lives of low-income folks, let's not add one more. Let's make it as easy as possible.

And I think about this a lot in my own context; right? I am now, thankfully, a homeowner. But when I was a renter, even if I had access to that information about my usage, the tips that were available from my utility company were this kind of general list of top ten things, and maybe one of them was turn the lights off when you leave the room. Okay, I have a studio apartment, I never leave the room. But then it was like invest in solar-thermal, and that doesn't apply to me.

And so I think that the one-size-fits-all kind of approach to how to be an energy savvy consumer really needs to get disaggregated quite a bit. And we need to really think about what are the ways to really get folks to change their behaviors? It's not just about awareness. It's not just if we hear the clean energy sermon enough times, we will -- we will make change. That will happen for some folks. But realistically, pairing the solution with the information needed to prompt folks to take that step is what's really going to get us there.

COMMISSIONER MCALLISTER: Can I ask a quick question?

So are there -- is there anyone doing that well in your estimation? Like are there models that are actually, you know, just in a very pragmatic way that you described, getting the right solutions in front of the right people at the right time?

MS. CHEN: I think that some of the programs that are coming out that do address whole buildings have a lot of promise for that. And I think that a lot of times the things that we see from Greenlining's perspective is from community-based organizations who get this and who are -- who go in that door prepared to bring both sets of information.

I think that some of the companies out there, like OhmConnect, for example, are starting to think about ways to motivate folks to act and providing the enabling tools, as well as thinking about the motivation. But I think that, especially for a lot of these companies that are starting up, their natural like first market segment is not going to be low-income folks because those are the harder-to-reach customers. I do see them kind of starting to move in those directions for sure, but I think that I haven't seen anything yet that is specifically tailored to the population we're talking about today. But if anybody out there has something, we'd love to hear about it.

COMMISSIONER MCALLISTER: Yeah. I want to sort of flip -- get the flip side of that, too, so -- and maybe, well, I don't want to get in the flow -- in the way of flow here, so maybe there's a subsequent question whether it's better. But just keep this in mind.

Is there -- so how can data be utilized to get building owners engaged and motivated? I guess, you know, we're doing a lot of work on data at the Energy Commission. And the eventual goal is to push a lot of that out to the world and local governments and other stakeholders, and that could include, you know, a population of building owners that we could identify and convene and do something important with them. But making it -- how do we show it's worth their while; right? What kind of data do they want to see? What kind of information, knowledge, you know, sort of vision that's informed do they want to see that will bring them to the table and help them invest?

Because a lot of -- you know, we're talking about, for the most part, we're talking about privately-owned buildings that have renters in them. So we've got to -- they're kind of a key stakeholder and we've got to figure out ways to work with them. And how can we use our informational landscape to make that happen?

MS. CHEN: And I think that the need to connect the information with the solution is present there, as well. I think Isaac was talking about the financing cycles that, particularly, the rent-assisted properties are subject to. And really, everything operates around that. If you're not able to get onto the natural cycle that those buildings are on, no matter how committed that owner is going to be, their hands are going to be tied by just financial and practical concerns.

MS. SUTLEY: I think also, you know, you need to -- I'm sorry -- you need to make these programs easy for whoever. So, for example, we have a Commercial Direct Install Program that we work, you know, with third-party providers, which is just kind of a menu of measures. And they go in and work with the customer and just do them, and they don't -- we don't charge our customers. You know, it's free. So that gets you -- at least gets you in the door.

And so we have found other ways to sort of get you in the door. For example, we were just about to finish our second annual LED distribution to all of our 1.4 million electric customers. So we've delivered to every household in Los Angeles, two LED lightbulbs with a bunch of information about other programs that people can take advantage of, and in a nice bag. And I think the bag has been the most popular part. I see them all over the place, a reusable bag.

And then finally, we, as I mentioned, we have been funding community-based organizations to help us with outreach to communities that they are much better communicating with than we are.

MS. BROOK: I wondered, Meredith, you

could just maybe just reemphasize what you talked about in your opening statements about using the health professional to introduce energy efficiency? At least that's what I thought you said, and that sounds like it would really, I think, be appropriate to speak of here in terms of getting the information, you know?

MS. MILET: Yeah. Sure. I mean, I think there are a lot of home visiting programs for health. And those are -- usually, people who have established trust are very trusted by the tenants. And so that's a way to the other direction, maybe not, you know, to get the owners to want to step in, but to get the tenants interested, is having those people who are there for another reason that is maybe higher on their priority list right now, and how are often, if they're (indiscernible) or community health workers, they're often really trusted by the families and let into the home already.

And I know, also, that people don't want a lot of people coming to their home a lot of times. And so to have them have this extra expertise and be able to try to connect them that way --

MS. BROOK: Fantastic.
MS. MILET: -- I think is helpful.
MS. BROOK: So has that program been evaluated or publicized in any way?
MS. MILET: Not yet. It's starting to be. I mean, I think that Contra Costa County, and they've been working a lot with RAMP, Regional Asset Management Prevention, they've given presentations on it and stuff, but they're -- it's still pretty new. It's been about a year, I think, and so they're still trying to evaluate it. They're kind of like on a shoestring little operation, so like you said, evaluation isn't costless, but it's been difficult. But they're trying to collect a little bit of data around that too.
The other thing along those lines that I can't help but think about when you're talking about getting the building owners motivated, and I know this sounds really Pollyannaish because, obviously, the money is going to be the most important thing but, you know, health is a motivator for people in ways that other things aren't.
And I know, it reminds me of, there are

these medical programs for asthma where if there are patients who are renters who have asthma symptoms, and some of the household problems like leaks or things causing moisture or pests and they aren't -- their landlords are not responding to wanting to get things fixed, there's a program, basically, it sounds so simple, but where there are doctors who write a letter to the landlord. And they've had a lot of success because I think people just getting that letter from a doctor who, you know, who seems more of like an authority figure, sometimes they don't have to go through legal recourse because once they get the letter from the doctor, they make the changes.

MS. BROOK: Well, that's fantastic. It's sort of like getting a letter for an emotional support dog.

COMMISSIONER MCALLISTER: You don't think an energy engineer has that level of credibility? I don't know.

So I want to just highlight that about Contra Costa County, because I've heard the same thing, that they're trying -- they maybe have filled or their trying to fill a position to do that coordination directly between their health services department, you know, I'm going not get the names wrong, and their energy and sustainable side of the shop, and so those have been siloed. And so they're trying to actively make sure that those programs coordinate, and I think that's a great example. And I think it's front end, you know, on the front end, but that has a lot of promise, I think, too.

MS. SUTLEY: If I could add just one quick other example? The L.A. City Housing Department, you know, routinely inspects multifamily housing. And so they have a program called Gateway to Green where, when they are inspecting rental properties, they are able to provide information to the properties about our energy and water programs. And so that's been, you know, an effective way to communicate, at least with the building owners.

MS. BROOK: Great. Those are really great answers to that -- those -- that set of questions.

Moving on, there's a little bit of overlap here, but let's just touch on it. And if there's anything new that you can add and any other questions from the dais, that would be great.

Benefits to customers. How can we maximize benefits to customers in low-income and disadvantaged communities? What tools and data are available to target deployment and what tools are still needed?

So we've touched on some of this, but if there's anything that any of you would like to add before we move on to non-energy benefits, let me know. Any other questions? Does anybody want to touch on that?

MS. CHEN: I would actually suggest that we think about benefits, not as energy benefits and non-energy benefits, but just as benefits. And there are, of course, there are those kinds of benefits.

But I think one of the things particularly that I'm seeing in the IOU program that's starting to create some problems around -- well, not starting to, that has been and continues to create problems around effectively reaching low-income folks, which are the higher-hanging fruit in this challenge, is that we are looking at stuff that's on the bill, and then we're kind of trying to secondarily work our way into the non-energy benefits around some of the health outcomes, around quality of life outcomes and whatnot. And then we end up in this, oh, this isn't cost effective, so maybe we shouldn't do this, or maybe we should do less of it.

Well, okay, hold on a second. If someone is living in Bakersfield and they're not using air conditioning during the summertime, they're not using any kind of cooling during the summertime because they don't have a way to do it without it costing hundreds of dollars, they're not going to do that. You get them energy efficiency climate control, and guess what? They're going to use it. And we want them to use it. And that should be a benefit that doesn't compete with energy benefits.

And I think that the way that our systems are set up now, and the Commission is working its way through breaking down some of these barriers, but one of the real keys is going to be stop thinking about energy benefits and cost effectiveness and then, also, non-energy benefits. We've got to think about it more holistically.

MS. ADEYEYE: I have a question that kind of dovetails on what you just said, Stephanie, and I think what Isaac said earlier in his presentation.

So when you're thinking about benefits to disadvantaged communities, how are you thinking about the way that those benefits might differ, for example, someone in Bakersfield versus someone in San Francisco, and are there things that should be considered in this process around the locational differences for disadvantaged communities?

MS. CHEN: Yeah, absolutely. That's a really good question. And I think that I would actually look to Meredith to talk about this, because the first things that come to mind for me are some of those environmental health issues. Environmental health outcomes are going to be radically different between the two families that you just described. And quite frankly, I'm not so worried about the environmental health outcomes for most of the neighborhoods in San Francisco, not all, but most. I am extremely concerned about the ones in Bakersfield. I think that's the one that really jumps to mind for me, the top of mind.

COMMISSIONER MCALLISTER: And why is that, because of indoor air quality issues or just air quality issues?

MS. CHEN: Yeah. I mean, (indiscernible), I don't have a lot to add but, yeah, I think there will a lot of differences. And the heat examples are really -- it's a really important one, especially with the change, the fact that things are going to get hotter.

MS. BROOK: Well, we're moving into non-energy benefits, so let's just keep going.

So the question is: Which non-energy benefits are most valuable to customers and building owners in this multifamily low-income sector? And which ones are program administrators looking to track and analyze? So that's kind of to the point that maybe they're not the same, so any discussion on this with this panel would be great.

Meredith?

MS. MILET: I can start and probably reiterate, but I think that one of the things I want to emphasize is that I think when you say what's most important, energy cost burden comes up, even from a health perspective. So I just don't want to forget that we have actually now, through this health equity, a list of healthy community indicators. And they are sort of our list of indicators of what we call social determinants of health. And so -- and energy cost burden is one of them, so we think of that as a health indicator, even though it's not a direct health outcome. Although, like you said, it is different, like in terms of our program administrators or our staff, we'd also like to be able to track the actual changes in health outcomes when that's possible.

And in terms of health outcomes, if you're thinking about which ones are important, we touched on them, asthma, cardiovascular disease. But it could also be done as general hospitalizations and emergency department visits, if that's an easier thing to get. And, also, the indicator of asking people how they rate their own overall health has been shown to be really well correlated with health. And so that's one of the things I think that we added to the Contra Costa County pilot because it was just too much work to try to get a lot of really in-depth health outcomes. So can we ask these people this one question, you know, how do you rate your health before and after?

And then the other thing I want to emphasize is to not forget mental health and stress, because those are really important and maybe even more sensitive to these changes in savings than other health outcomes.

MS. BROOK: Nancy or Mary?

MS. SUTTER: I'll just really quickly say I find it fascinating that Meredith was talking about, you know, you figured out one question just to ask that really can take the place of what maybe other folks might consider a much more rigorous and, therefore, a much more expensive type of approach to actually determine, you know, some of these health outcomes. And to me, it may be considered a proxy, but it's a direct proxy in terms of what you have and much less expensive to get, and yet it's something that you can use to help make decisions.

MS. SUTLEY: The thing I would add is just, you know, for us, one of the things we're able to do somewhat easily is to work with other city departments, so we look across, you know, different emphasis.

So, for example, we've had a program for a number of years with our Department of Aging where we give out fans every summer for elderly people in L.A. And, obviously, that's a huge -- there's a huge health issue associated with heat. And we can get sort of the most energy efficient fans into people's homes.

So I think that, you know, thinking, and to the health example, I think thinking beyond just the utility or the, you know, sort of the energy questions narrowly can start to target programs that provide multiple benefits. And we've had a program for a number of years where we actually give our low-income customers a new refrigerator. And I think that there are benefits beyond the fact that, you know, old refrigerators are very -- use a lot of energy, to get a new refrigerator into somebody's home, it also means somebody shows up and knocks on the door and is with the person getting the new refrigerator.

MS. BROOK: Great. Super. Okay.

So the last question we have is metrics for progress. Are data -- do you have any follow-up questions?

COMMISSIONER MCALLISTER: Yeah. Actually, I wanted to -- so nobody has mentioned jobs. And I guess, I mean, you can consider that a non-energy benefit; right? I mean, we're in these communities. I want to deepen, in the afternoon, the question of -- or get everybody's thoughts and encourage people in their comments to talk kind of about how best we can move forward interacting, how best we can interact with local communities, nonprofits and, you know, all the sort of stakeholders that really are in the know and can help us -- help get success locally. I think it's our obligation to kind of figure out how best to reach out to them, not only in this context but in the 758 Action Plan update and in the doubling work that we're going to do, we have a lot of parallel work that we really need to get out there into the world and hear from people about.

And I guess it's -- so economic development is a goal that is really bound up with everything we're talking about here. And I guess I want to -- you know, I personally, you know, I think, and maybe I'm wrong here, but I think that the most effective approach is going to have somebody that sort of talks your language and is from your place, coming and knocking on your door to do work in your apartment or your dwelling. And it seems like keeping money local and sort of injecting money into the local community is one of the best ways we can have a positive impact in those places.

So I guess in terms -- how do we -- how might we think about that as a non-energy benefit, just the local ecosystem of projects that's the actual work that's going to be done in these facilities, these buildings?

MS. CHEN: I've got some thoughts about that. Yes to all of what you just said. And I think that the way to really operationalize all of these good intentions that we have around creating a clean energy economy from both the supply contractors and job side, as well as the demand customer side of things, is to approach the job creation question in the same way that we are approaching all of these other questions that we're focused on.

If we want to save kilowatts and therms, we set a goal. We figure out what the product or program is that's going to look like it, that's going to look at addressing that concern. We resource it with dollars. And then we evaluate it on the backend. We're really not doing those things comprehensively or effectively when it comes to the jobs that are associated with these programs. Tracking data about who's getting the jobs is kind of here and there. And a lot of the programs are not resourced to support workforce development and the pipeline from training opportunities into on-the-job, earning money, career advancement opportunities because those are, again, considered one of these nice to do non-energy benefits that's not cost effective to do it with folks who are trainees.

But to your point, if we're really talking about not just creating like market transformation, but we're talking about creating social transformation, we have to think about that and we have to resource those efforts in the same way that we would resource efforts to save kilowatts and therms.

MS. SUTLEY: And we -- so LADWP has -- in fact, they've had a long history of working with community-based organizations on retrofits. And, for example, in the '80s and '90s, you had a toilet replacement program that was entirely carried out by community-based organizations who literally drove door to door, knocking on peoples' doors and asking if they wanted a low-flow toilet. It was a very successful program. And there's a coalition of community-based organizations in Los Angeles that the city has been working with around retrofits of public buildings.

And finally, I want to mention, we also have within LADWP a program called the Utility Pre-Craft Trainee, which is trying to get people into careers at LADWP. We, like other utilities, are facing a wave of retirements, and so this is a way to get folks interested. And, you know, it's a program that allows them to see what a utility actually does. And one of the programs that they work on specifically is our Home Energy Improvement Program, which is a home retrofit program that's available to both single-family homes and multifamily homes.

MS. BROOK: Great. Our last question, and again, I think we've touched on this some, but if there's any final input the panelists would like to provide, that would be fantastic. Then we're going to open it up to the workshop participants.

Are data-driven metrics currently incorporated into multifamily program design? If so, are these the best metrics to track progress? If not, what else should be tracked?

We've heard that we can't silo these different metrics, that we have to sort of, you know, think about it holistically. Is there anything else the panelists would like to contribute to this?

COMMISSIONER SCOTT: Martha, can I add a little overlay to the metrics question? And I think it kind of captures much of the conversation from this morning.

And I think that maybe the goals that we have in the low-income multifamily building space actually pull the metrics in opposite direction; right? So if we're talking about a family in the Central Valley who doesn't have energy efficiency, may or may not have air conditioning, and we want to make that house a livable space, get some energy efficient air conditioning in there, that's likely to have the energy use go up. But that's a good thing because now the family has a livable space; right? And so our metrics in these areas really do pull in different directions.

You know, another example is as we move towards more transportation electrification, again, we want to have the building energy use go down, but we're getting ready to plug in something that's going to pull the energy use back up. And so as we're looking at metrics, I think I'd love your all's thoughts on how do we not have it one-size-fits-all, but also not kind of get wrapped around the axle because everything starts to get very complicated if you're looking at kind of the push and pull.

MS. BROOK: Very good. Thank you.

MS. SUTTER: Well, I have two things. Directly to your kind of thought, to me, if you have a set of metrics that you look at holistically, and sometimes some go up and some go down, but overall they're moving in the direction that you want, and, Meredith, it sounded like there were multiple things that Contra Costa County looks at in terms of thinking about the health and welfare of their residents and their community, and that's one way to do it. So you might say, yes, energy is going up, but this other metric that we have that talks about quality of life is also going up, and so that's going to fit for us.

So to me, you need to think of these in a group and kind of put it together.

The other thing I will say to kind of the question that Martha posed to us is at least within the energy efficiency and the ESSA, the common area of metrics that I'm familiar with -- and I will premise this by saying, you know, I am not the person who's been involved in a lot of this. I think that there are people here who have already been thinking about this more. But I will say that many of these metrics are what I would call output metrics and not the outcome metrics. And yet, it is much more cost effective to embed some of the output metrics in data collection as you go within a program tracking database. Often, some of the outcome metrics require a bit more effort to ask maybe that one question when you're already onsite, or having to go back and get some of these people, so --

MS. SUTLEY: The other thing that's

(indiscernible) is just, you know, sometimes I think we try to shoehorn too many things into the utility programs. So as we look at our programs, I mean, we really, we have significant constraints. We have constraints on what we can spend money on. And so I think focusing on sort of -- it helps our customers but it also helps us if we use less energy, if our customers use less energy, certainly justified from a cost perspective.

And so, you know, we go through a process of evaluating, you know, different energy efficiency programs around cost effectiveness and other things. And we can choose to, you know, to consider other things, as well, but it’s a pretty constrained universe, and particularly for public agencies where we’re constrained by Prop 26 to ensure that our programs are all cost based, and that has made things more challenging to reach low-income customers specifically.

So I think looking for those opportunities to partner with other, whether other city departments, other state agencies, other programs where we can help to leverage what the utility can do with what other actors can do.

MS. CHEN: Commissioner Scott, I think what came to mind with your question, which I think is pretty spot on, is some of the stuff that Eugene was talking about in the CLIMB Action Plan in particular, talking about needing to align programs so that we don't have competing transportation electrification and energy efficiency; right?

And then also just a lot of these programs need a little bit of a dust off. You know, they need a little bit of -- we can call it spring cleaning, whatever we want. But like, I mean, this is one of the -- this is one of the maybe down sides of California being able to move as quickly as it has on a lot of clean energy advancements all at the same time is that our programs, in particular our legacy programs that were kind of the first and second ones through the gate, haven't kept up and haven't evolved along with all the newer programs that are stacking alongside of it.

So I actually think that the process of taking a look at some of those legacy programs with a fresh set of eyes and with a set of eyes that's informed by everything that's going on right now will help to identify some of those areas that need some tune-ups, and hopefully some solutions, as well.

COMMISSIONER MCALLISTER: It would be really helpful if you could just sort of feel free to name names in your comments. I mean, you know, I mean, we're all friends here. We're all rowing in the same direction in the same boat. So, you know, let's just call a spade a spade if we feel like we need to. And, you know, we're all -- we have big bureaucracies to negotiate and navigate and, you know, it's okay; right? So I feel like, you know, productive conversation kind of needs us all to be clear about what we're trying to say, and so I just want to make that general comment.

MS. BROOK: Okay. Does the audience have any questions for this panel? We have about ten minutes before we break for lunch.

If not, then thank you, and my stomach thanks you.

MS. GOLDEN: Hi, this is Rachel Golden. I'm with the Sierra Club. And I had a question about indoor air quality and health.

And my understanding is that combustion

appliances, especially gas appliances, are a large source of indoor air pollution, like carbon monoxide, criteria pollutants and formaldehydes. And I'm wondering if -- and I know that indoor air quality is a very hard thing to measure across the state. And I'm wondering if an appropriate metric would be sort of appliance replacement from combustion appliances to zero-emission appliances, if that would be a good proxy for improving indoor air quality and also support media fuel switching policies?

MS. MILET: I won't pretend to be an expert on indoor air quality. We have a whole section on that. So in any case, I can refer you to them. But that does sound like it is one of those more win-win data solutions; right? If you're switching and you're reducing that exposure, and then also reducing the energy efficiency.

That does bring up an interesting question. If you -- there is also the opposite direction health issue that we have to guard against which is when you make buildings tighter, you have worse indoor air quality. And I think that a lot of times what we're talking about are -- those are different things. When you make some changes to a building that already is kind of old but it's just changing some of the sources of energy or the -- it's not changing the whole envelope of the building, then you don't have to worry about that. But in terms of newer buildings, yes, that is an issue.

MS. BROOK: Does anybody else have any questions for the panel before we conclude?

MS. RAITT: So sorry, I'll just jump in, Martha. We did, I think, get one on WebEx.

MS. BROOK: Oh, good.

MS. RAITT: So we weren't planning to necessarily open up before public comments, but it looks like we got a comment from Deborah Little (phonetic).

"Aside from consumption data, how can project details data be useful to policy, building owners and builders to understand what measures were installed and the results?"

I don't know if someone wants to address that.

MS. BROOK: Well, it sort of sounds like an evaluation question to me, like I would expect, I mean, if there was a program that was evaluated, it would talk about what measures were installed and how effective they were, so unless I'm missing something and you guys see a different question that was asked.

Yeah, I think that's like the typical -- I think the typical answer is we evaluate the program. That's I think historically what we've done to understand measure effectiveness. And like Tami was going to introduce, they have both profits evaluations and impact evaluations that are typically done. And the impact evaluation would go more to the measure effectiveness, and then the profits evaluation would be more about did the -- was the program overall effective in meeting its objectives? So I guess that's how I would answer that question.

MS. SUTTER: I'll add one thing on specifically with low-income families. And it is more difficult to get billing data. And they move more often, so you're unable to necessarily get what you can often use in energy impact assessments, which is a year post -- or a year pre and a year post. It's more difficult with that particular population.

I am unsure how often, especially with

this type of population, the evaluation is really more using what I would call ex-ante values, you know, values that everybody agrees are you put this in, you're going to get this much savings, whether or not there is the money available to actually go and do a true impact assessment of energy and demand using billing data, which can often then show or not, you know, that there really is this savings. Now the ex-ante values are typically pretty good, so I don't want to, you know, say that they're awful. But I'm just not clear how much some of the assessments are able to do it, just simply because of the population type.

MS. BROOK: Okay. That's a very good point. Thank you.

MS. SUTLEY: Yeah. Just a couple of things. When -- do a potentials study every few years to just, you know, kind of assess what opportunities are out there and base our programs sort of on that.

And I also wanted to just mention one other study we were doing which actually was a response to Commissioner McAllister's question about economic development. And we've actually done a job creations study, actually, UCLA has done a job creation study for us on our energy efficiency programs, and it's in the process of being updated right now.

MS. BROOK: Great. Okay. So thank you so much. You guys were fantastic for our first panel. It was really informative and I really appreciate your participation.

And I'm going to turn it back over to Heather.

MS. RAITT: All right, so we'll take a break and come back at 1:30. Thank you.

(Off the record at 12:25 p.m.)

(On the record at 1:33 p.m.)

MS. RAITT: All right, so we'll go ahead and get started again. Whoops. Excuse me.

So for this afternoon, we're going to open up a panel on Innovative Technologies and Multifamily Building Programs. And the moderator is Mikhail Haramati from the Energy Commission.

So go ahead. Thanks.

MS. HARAMATI: (Off mike.) So the folks on this panel are really trying to understand how to get innovative technologies into multifamily low-income buildings. And so the panelists that are going to be speaking shortly represent folks that are either managing or doing retrofits in apartment buildings. We also have an owner of housing authorities that own a number of different types of buildings and manages those buildings (indiscernible). And they'll be able to speak a little bit about what it takes (indiscernible) buildings and operators who want to do these types of retrofits. And we'll also talk a little bit about some of the solutions with overcoming some areas (indiscernible).

So similar to the morning panel, I've asked the panelists to just kind of give a brief bio and then a couple of talking points, and a number of them have slides. And then we'll go into the prepared questions. And then we'll end up on a broader Q and A.

MR. BROOKS: (Off mike.) Okay. Hi everybody. My name is Andy Brooks. I'm (indiscernible) for the Association of Energy Affordability. And we're a nonprofit technical services organization dedicated to bringing energy efficiency and renewables to multifamily buildings in order to foster and maintain our goal in helping housing communities, particularly those of low-income. And we're pretty much an on-the-ground organization. We spend most of our time out in buildings, doing assessments, troubleshooting, developing specifications for retrofit projects, getting stakeholders engaged, working with contractors, and basically doing everything that's necessary to actually get retrofit projects through from beginning to completion.

So a lot of that work that we do is through our role as program implementors, so we implement a number of multifamily programs throughout the state for a variety of different administrative agencies and utilities. And they all tend to be whole-building comprehensive, both energy efficiency and solar programs, so the largest being the Low-Income Weatherization Program that we implement for CSD, Community Services and Development, which is a greenhouse gas reduction program funded through Cap and Trade GGRF funds that does both efficiency and solar.

And then a new program that's going to be coming online later this week that was mentioned earlier, the SOMAH program, we are on the administration, the nonprofit administration team for that billion dollar over ten year solar program.

Then the other area that we do a lot of work in is on the research and demonstration project side. We have a number of CUT-funded EPIC research and PEER (phonetic) research funded grants that are all focused on multifamily in some way, shape or form. Most of them are more specifically targeting zero-net energy, you know, pathways towards zero-net energy. And then we have some that are more focused on indoor air quality, which was mentioned quite a few times earlier today.

So kind of all of the work that we do is in multifamily in some way, shape or form, and most of it is in the low-income affordable housing space. So hopefully some of the experiences we've had can help contribute to the conversation. And I didn't prepare the talking points. Most of those, I think, will come out in the discussions that we have from the questions that come up.

MR. NARAYANAMURTHY: Thanks, Andy.

Thank you, Mikhail.

So I'm Ram Narayanamurthy. I'm with EPRI, the Electric Power Research Institute. EPRI is a not-for-profit public benefits research organization focused on research related to the electricity city end to end, all from the generation side all the way to the end-use side. Most of my personal focus still has been on the integrated buildings area, so we've been working on a few different zero-net energy demonstrations, both for new construction retrofits, as well as working on technologies that are what we call filling the gap.

So within that portfolio, we work with utilities around the country. We have quite a few demonstrations through the EPIC Program and conjoined that are also demonstrations in other parts of the country, like Alabama, Georgia, North Carolina, et cetera, looking at holistic community-scale, an option of energy efficiency and solar.

So part of the reason I think that what we wanted to come to the panel for was to talk about some of the experiences that we have had with some of our EPIC projects in California. We've been working with property owners. Dave has been one of our great partners. We have also been working with some other property owners of low-income housing. And part of our work has been looking at what it takes to retrofit from a holistic whole building perspective.

And some of the learnings that we have, for example, one of the projects that we completed in Lancaster, one of the things we learned -- and as you go through these projects, what you learn is that it's not the technologies, per se, or the individual technologies that matter as much as the overall process of how you go about this retrofit. And so some of our learnings said, okay, hey, if you're doing solar, for example, combining solar with energy efficiency in a lot of cases makes sense because you have one opportunity over a longer period of time to be able to do a very deep retrofit. So when you're doing solar, for example, if you're updating your roofing, you have more insulation on your roof, then automatically you are getting a double benefit to it.

So a lot of it goes down to how do you actually combine technologies, multiple technologies to provide packages that also have less imposition on the tenants?

One of the other things we learned was that, hey, if we don't engage the property owners, it's really hard to get those benefits down to the tenants because without the property owners, they're not able to participate in this program.

Some of the other learnings, we have also been looking at how do you take all the links and work more towards GHG reduction through a combination of electrification and efficiency? And so we also run into challenges with, for example, the distribution system being able to handle (indiscernible).

And in terms of some of the technologies that have opted out, things like air sealing, non-inclusive air sealing methods for existing construction, technologies, let's say, for example, smart thermostats that don't rely on Wi-Fi, how do you actually balance master metering while still managing behavioral elements with master metering so that you have overall efficiency (indiscernible)?

So those are some of the things that pop out, and I think we'll be discussing more.

MR. BRENNER: Okay. Dave Brenner with the Fresno Housing Authority. There should be slides in a second.

COMMISSIONER MCALLISTER: Yeah. I think everybody thinks it's sort of -- I know we're such an amenable group. I know we don't want to overpower each other. It's really great. But it would be good to speak it up so everybody can hear in the room, and also the reporter.

MR. BRENNER: Okay. Just as a little bit of context, this is Fresno County, so they're mostly DACs. The household incomes are very low. And it's quite hot; there's a lot of cooling days.

The Housing Authority is a really active developer, so with our new projects, we're able to do a lot. We use utility modeling to capture the value, and then it sort of pushes back in, in debt. And so all of our new products are 15 and 20 percent above code and we do a lot of innovative work on those. But then we also have this huge portfolio of other projects. Some of them are HUD properties built in the '50s, and these are cinderblock duplexes mostly. And there isn't a really a good value capture mechanism, so we have a hard time retrofitting those. And the other ones are farm labor properties under USDA and there's no mechanisms at all.

Next slide please.

So last year we did six projects with LADWP, with AEA. And they were on a really tight timeline, which is always hard for developers. But so in the left you kind of see what was really straightforward for us. So they pay about 60 to 70 percent of the total cost, and so a lot of these things are no-brainers in that regard. They pushed us really hard on heat pumps, but we had a hard time with the local jurisdictions. We had a hard time with the local contractors. And we had a hard time with USDA when we tried to share systems because it would affect the way our subsidy is calculated.

COMMISSIONER MCALLISTER: Could you describe the USDA kind of context --

MR. BRENNER: Yeah. So --

COMMISSIONER MCALLISTER: -- maybe with just a couple sentences maybe?

MR. BRENNER: -- the USDA supported the construction of these properties back in the '60s and '70s. They continue to give us operating subsidy, which is part of the income for the properties, what keeps them going. But other than that, there are properties we own and maintain the properties.

COMMISSIONER MCALLISTER: Have you looked into the subsidies that are available today from the USDA, sort of rural programs, you know, to do energy -- clean energy work?

MR. BRENNER: Yes. So they haven't had a call. I think it's two years since they had a call. We have looked at some of them. They're pretty poorly funded at this point. We're hoping in the next couple of years that those projects will get -- the programs will get a little more robust.

MS. HARAMATI: I was going to say, too, can you just state how many properties you own and sort of in what capacity? I think that would be helpful for folks.

MR. BRENNER: Yeah. So we own 75 total properties. We are a Housing Authority, so we are a government agency, so we have a regulatory function, but we also are the owner and property manager and the development agent for those, as well. And in some cases, we self-finance because we have our own finance mechanism.

Yeah, sorry, it’s a lot of housing stuff that I’m going through fast.

The last point I just wanted to make on this is they have evaporative coolers, which is a hard thing to deal with for three months of the year in the Central Valley, but there’s no mechanism within this. It’s a GHG program, so there’s no way that we could replace these.

Next slide please.

And this is a new construction project we’re working on with EPRI and Ram. It’s a complicated project that has a lot of sources of funding, a lot of ownership complexity. It’s a retrofit and new construction in one. There’s potentially three different CEC sources of funding, which is even more complicated. But it’s also an uncertain timeline, so some of these might fall out. And then just very briefly, on the right is kind of the discussion that Ram is walking us through. So the program that he’s running is paying the delta between a regular wall and a high-performance wall, or whatever the measure might be.

So in that context, some of these things, you know, make total sense to an owner, the top three make total sense. He's kind of trying to sell us on centralized HVAC, which is really interesting to us, but there's a lot of unknowns to us. So I think a bit of data and a bit of demonstration would help us with controls, as well.

And then I think there's also an unknown future for all these buildings. There's a possibility you might consider individualization of units in the future, so we're going to be building in electrical redundancy. And the other ones are pretty straightforward.

So next slide please.

And then lastly, we oversee the Section 8 program where we add -- we provide administrative support to that program. And there's a lot of talk about trying to reach those landlords.

In Fresno, it's very hard because there's low vacancy, low rent properties. And often when the investments are made it doesn't change rent or it doesn't change vacancy levels, and it definitely doesn't change operating subsidy that comes from the Section 8 program. So a couple of things we've experimented with are the ESA (phonetic) program. We are now blanket certifying tenants if they are Section 8 tenants. And we're trying to make the ESA program more attractive that way. We're also trying to integrate some of these programs into our inspections program.

And the last thing I just kind of wanted to point out, a lot of these landlords are motivated by ease of manageability; right? So you talk to them about cost savings, which don't go to them, and you talk about some of the upgrades, they don't care that much. But if you do something that actually improves and makes it easier to manage their property, they can be quite receptive.

COMMISSIONER MCALLISTER: So these are not deed-restricted properties, right, the Section 8?

MR. BRENNER: These are, well, for the majority, not deed restricted. Some are project based. But the majority are not deed restricted.

COMMISSIONER MCALLISTER: Okay. So I guess, you know, no need to answer fully now but, you know, what would be the lever, what would be the moments where if there were a program that could throw, you know, a couple million dollars at a project of some scale, you know, when would that really be -- when would an opportune moment, if any, appear to do that with these non-deed-restricted properties?

MR. BRENNER: Yeah, it's tough because maybe one of them has ten Section 8 vouchers on it out of 40, but next year it has two. So it's not -- I think there's no clear answer for that, unfortunately.

MR. DRESTI: Okay. Good afternoon everybody. My name is Mauro Dresti with Southern California Edison. I manage the group that does demand pilots, demonstrations and programs on the customer side of the meter for the company. So I'm going to talk about MUDs in context of the success and difficulties we've had with getting them in our Charge Ready Program. So the slides I have actually talk to that in context.

Next slide.

So for those of you that aren't aware, Charge Ready is a program that SCE is running to install charging stations at noncommercial properties. The segments are workplace charging, opportunity charging, like at malls or sport events, things like that, fleet charging and MUDs. And the way it works is that we go out, we start a program. We advertise to folks. We've marketed, so on and so forth. We own all the infrastructure and install the infrastructure on our side of the meter. And we also own and operate and maintain the infrastructure on the customer side of the meter.

And then what we do is we have stub outs, called make-ready stub outs, that customers can then go ahead through our rebate program and install electric vehicle servicing equipment on top of those -- on top of those items.

The amount of rebate that we give is based on whether they're in a DAC or not. They get 100 percent if they're a DAC. And they get a minimum of five units if they're in a DAC also.

Next slide.

So we've been at this since February of 2017, actually January. We're up to 103 -- I mean, 1,003 charge ports installed at the various -- at the various sites. We have 65 projects, so it's approximately 15 charging ports per site.

Next slide.

So this is a breakout of the number of sites per different marketing segment. By far, the workplace charging is the largest, it's at 40 percent or so -- or 40 projects, I should say. Destination centers come in next at 23, fleet come in at 8, and MUD's come in at 3 projects.

And the next slide, too, it shows, actually, the breakdown if you want to know a little bit -- well, excuse me, the next graph next to it shows the breakdown as far as whether it's a federal customer or private business, and so on and so forth, so mostly private business.

Now the next slide actually shows that we've had 440 customers that have applied. It's first-come-first-served type of program. And like I said, out of all those, we have three sites that are MUD-based.

MS. HARAMATI: Can you say what that acronym means?

MR. DRESTI: Multi-unit dwellings. Sorry, it's an acronym world. What can you say?

And that's it.

MS. STOVER: Hi. My name is Alice Stover. I'm the Director of Customer Programs at MCE. So MCE is a California source community choice aggregator. We've been around since 2008 and we've been doing energy efficiency programs since late 2012.

The first energy efficiency program that we launched was a multifamily program. And one of the things that we noticed with that program was that we had -- somewhere around two-thirds of our participants were low-income properties, despite it not necessarily being targeted at low-income customers.

So just towards the end of last year, we launched a complementary program called LIFT (phonetic). I should say, our Energy Efficiency Program is funded through the CPUC Energy Efficiency funds. And our LIFT pilot is funded through the low-income funds from the CPUC. And our objective with this pilot Is to blend the funding from those two program sources and building on the existing infrastructure that we had in our multifamily program and build out some offerings specifically for those low-income properties.

So our Multifamily Program is a comprehensive program. We do technical assistance, rebates for whole building work, common area work, as well as in the regular energy efficiency program, some direct install measures. With the LIFT Program, we're going to add on top of that and provide a lot more of a robust in-unit work at no cost, while also encouraging properties to go through the regular EE program for whole building measures or common area measures.

I wanted to talk a little bit about some of our strategies and a few challenges, and then we can -- yeah.

So one strategy that we employ at MCE, we call it the single point of contact, and this is the theory around our program design. And the idea there is we really want to bundle as many energy and resource conservation offerings as possible for our customers when we -- when we have a point of contact with them.

So, for example, we've had a long partnership with the water agency to install water saving measures. You know, the Low-Income Program is an example of this. We also partner with the Green and Healthy Homes initiative to do health upgrades, safety upgrades. And now we started building out a few other complementary programs, including a Multifamily EV Program to complement a very similar offering that PG&E has in our service area.

And we see two benefits to this program design. One, we're able to reach more properties because each of those agencies that we partner with has a different touch point and different sort of point of access to customers. And we also get a much more comprehensive understanding of the needs and challenges associated with that property and what they're facing.

So I guess one good example of this, we had a property developer come to us. They were really concerned about water usage on their site. So our technical assistance includes that energy and a water assessment. And so they weren't necessarily interested in the energy component of it. But by being able to offer the water assessment alongside the energy assessment, we did both water and energy efficiency upgrade or upgrades, and now are employing other opportunities, such as the health upgrades at that site, as well.

I think on the -- I just wanted to speak quickly to two challenges. I think data collection, and then verification, is the challenge for us. I know it's been mentioned here today, but the income restrictions are not uniform across all of the programs that we work with. And some of them have quite low restrictions. And so we find significant gaps between the customers who qualify for programs and those who are actually experiencing problems, stress around being able to pay for energy.

And then the other one is just the verification process for income qualification. It's challenging. Especially in today's political climate, there's some resistance to collecting data. That's another challenging component. And then I think cost effectiveness is another challenge that we face. So we see a lot of value in this approach of combining multiple streams of funding and doing really comprehensive projects. But it tends to be less cost effective than sort of focusing on a very narrow set of measures. And with some of the funding sources that we're working with, we do have a lot of pressure to be cost effective in what we're doing. So we see that as sort of, you know, pulling us in two different directions.

And then one last thing on the technology front. So with our LIFT Program, we are -- we have a focus on fuel switching to heat pumps from gas appliances. And then we also will be adding, like I said earlier, adding on incentives for low-income customers to purchase EVs at those sites that receive the free -- or the fully paid for charging station to sort of, you know, help round out that offer.

MS. HARAMATI: Okay. Thank you.

So next we'll go to the prepared questions. And I want to invite the Commissioners to jump in here. So you may have follow-up questions or want to ask questions of your own on the topic, so feel free to do so.

So the first question is really about innovative technologies. So one of the things that we've heard is that not all building owners or potential participants in programs want to be Guinea pigs, right, for new technologies. So what are some of the more appropriate emerging technologies that would work well within multifamily applications?

COMMISSIONER MCALLISTER: Let me just -- I think this is Panel I questions that are up, and we need Panel II up there.

MS. HARAMATI: Yeah.

COMMISSIONER MCALLISTER: These are not your questions; correct?

MS. RAITT: I'm sorry.

MS. HARAMATI: So the first question is: What are some of the technologies that would be a good match for the multifamily sector, and then any potential differences between the technologies for low-income customers versus other multifamily?

And potentially, Ram or Andy, maybe you guys can start.

MR. BROOKS: Well, I think across the board the technologies that we need to kind of focus on right now are those that impact and effect when we use energy, as opposed to necessarily how much energy we're using. With the kind of 50 percent renewables by 2030, the intermittency of those is going to be an issue that we have to deal with across the board. So I think technologies that can help deal with that, regardless of the market sector or the building type, are going to be really important. So we've -- I think anything having to do with storage, load shifting, behavior modification, those are all technologies that are going to be critical across the board and are perfectly applicable in low-income multifamily buildings.

So our focus has primarily been on looking at heat pump technology combined with thermal storage. And we've done that both through the EPIC projects that we're working on, and then we're in the fortunate position of being able to do research in parallel with implementing programs. We've been able to move technologies and strategies that have worked in the kind of demonstration world into our programs as we kind of prove that they're working.

COMMISSIONER MCALLISTER: Andrew, could you describe --

MR. BROOKS: Yeah.

COMMISSIONER MCALLISTER: -- just quickly what a successful thermal storage project looks like in your context?

MR. BROOKS: Yeah. So most of the projects that we're -- the heat pump technologies that we're looking at are focused on domestic hot water, so providing hot water for potable uses. And it's a very kind of straightforward retrofit.

You know, as far as kind of emerging technology retrofits go, it's about the most straightforward that you can deploy. And we're going, again, from like anywhere from 60 to 80 percent efficient gas appliances to, you know, 200- to 300-plus percent efficient heat pump technology. So there's a huge gain in just efficiency just from the technology itself.

And then pairing that with excess storage capacity, so the ability to store large volumes of either hot water or, in some cases where the heat pump is also providing cooling, you can also provide stored chilled water. You can use those heat pumps during off-peak grid hours to generate that hot and chilled water and then store it for during peak grid events or, you know, peak pricing hours and then draw off those tanks, so that you don't have to use -- you don't have to run the heat pumps and draw power at those periods of time.

COMMISSIONER MCALLISTER: Are you mostly operating at the individual unit level or are you doing larger heat pump systems that have central storage?

MR. BROOKS: Both. So in the EPIC

project that we're working with Nehemiah Stone and Billy Green and Redwood Energy, that project is looking at four different demonstration sites, all of which have different configurations. Two of them have central heat pump chiller plants that provide heating and cooling and domestic. And then two of them -- one of them has individual heat pump water heaters serving each individual unit. And one of them has central heat pump water heaters that it's kind of a hybrid between individual units and central.

All of them are exploring what the appropriate thermal storage strategies would be in that context and basically determining, you know, what temperature water do we have to produce? What do we have to store at? How long can we ride through those peak events without causing inconvenience to the occupants? And I think that's ultimately going to be -- ultimately going to be critical right now with that -- still, batteries are going to be great for solar. But right now, using that solar energy to drive heat pumps that can then produce hot or chilled water that can be stored is still, I think, more cost effective. And the technologies are off the shelf. You know, the heat pump technologies are available. Tanks are tanks. It’s really a matter of dialing in what the control strategies and algorithms are to optimize it and what kind of signals we can feed into these systems to tell them when to run and when not to.

COMMISSIONER MCALLISTER: Are you doing -- so this is great. I could go down this rabbit hole for a long time, but I’ve just only got more question.

So are you integrating the hot and the cold side such that say when you’ve got a refrigeration loop -- when the heat pump is producing refrigeration or cool, are you using the waste heat, like on the hot side at the same time for hot water or whatever?

MR. BROOKS: One of the -- two of the projects that we’re studying under the EPIC project do have that capability where when it’s producing chilled water, the warm water that comes back from that chilled loop is used to preheat the hot water --

COMMISSIONER MCALLISTER: Right.

MR. BROOKS: -- on the domestic side, so it’s an energy --

COMMISSIONER MCALLISTER: This is great.

MR. BROOKS: -- recovery process.

COMMISSIONER MCALLISTER: This is great. All right, I love it. I love it.

MR. BROOKS: But those are kind of not necessarily like primo multifamily technology. You know, they're not the -- right now they're not quite at the point of being totally effective for multifamily. So on our next EPIC project, one of the technologies that we're very much looking forward to looking at are new unitary three-in-one heat pumps that provide heating, cooling and domestic at, you know, a smaller package and probably in a much more simple, from a control standpoint, a much more simple application.

COMMISSIONER MCALLISTER: Great. Thanks. Thanks a lot.

COMMISSIONER HOCHSCHILD: Thank you. And I just wanted to offer thunderous agreement about the prospect of more heat pumps being able to help, particularly just given where we are now with the renewable situation in California not yet having regionalization, we've having to turn off every single day in the state of California some solar or wind projects. And what we want ultimately is to have a happy hour where heat pumps and EVs are plugged in and making use of that surplus energy. And, obviously, that's an efficiency measure that can really help with our renewables goals. And so I really want to encourage you and say again how grateful I am for the tour that you led Commissioner McAllister and I on.

I had a question, actually, for Dave from the Fresno Housing Authority, just about the nature of the Section 8 opportunity. In particular, you mentioned the interest from the owners in being able to reduce sort of headaches and maintenance. And I would imagine transition to LED lights is a big help in that regard. Can you just give us a sense of the Section 8 housing you're looking at, what portion of the lighting is still incandescent or not yet LED and how that transition is proceeding?

MR. BRENNER: I wouldn't want to put a percentage on it because I guess they don't have a good feel for it. A lot of it is not converted. Very little is converted.

I think just when you talk to those

landlords, it's, I mean, they have lighting, they have crime, they have issues like that. So from their perspective, the more lumens you're adding to your site, the better the site is. And so they're not really looking at it as these are awesome light bulbs that are energy efficient.

COMMISSIONER HOCHSCHILD: What would you, just you, what would you guess, what portion if incandescent today? I mean, could you even hazard a guess?

MR. BRENNER: I would say it's more than half --

COMMISSIONER HOCHSCHILD: Still?

MR. BRENNER: -- I'd guess.

COMMISSIONER HOCHSCHILD: Wow.

COMMISSIONER MCALLISTER: Well, you're talking about the part of the lighting that is under the control of the landlord? Or -- because the individual units, those people would be, presumably, replacing their own light bulbs; right?

MR. BRENNER: Correct.

COMMISSIONER MCALLISTER: Yeah.

MR. BRENNER: Yeah.

COMMISSIONER MCALLISTER: Okay. So we're

talking common area, outdoor, you know?

MR. NARAYANAMURTHY: In our experience a lot of the unit lighting is actually plug lighting --

COMMISSIONER MCALLISTER: Yeah.

MR. NARAYANAMURTHY: -- so it's not fixed lighting.

COMMISSIONER MCALLISTER: Right.

MR. NARAYANAMURTHY: There's very little fixed lighting in all of these units. So the plug-in lighting, I don't think they fall under the efficiency programs as much as the fixed lighting.

MS. HARAMATI: So I'll just ask a follow-up question to Alice around whether you think that there are differences in the technologies or the types of interventions that are useful for low-income multifamily customers versus non-low-income?

MS. STOVER: Well, I actually think it's important that we're willing to invest in the low-income programs so that the offerings that we put out there for low-income customers are good and things that they will appreciate and use and help them meet their needs, and I think especially related to understanding energy usage and controlling usage.

So I guess I won't really speak too much to the technologies, but I just think that it's really important that we're not sort of doing it halfway but that we're really investing, and that it's quality work that we're doing in low-income property.

MR. BROOKS: I have something on that other point, just in terms of the technologies that might be applicable for low-income.

One of them is giving the tenants some understanding of how much energy they're using and when they should be using it versus when they shouldn't be using it. There are a number of products coming on the -- there are already a ton of products on the market, but there's more coming on. And the capabilities of those technologies, you know, varies from product to product from being as simple as just a light on the wall that says now is a good time to use energy versus a bad time to use energy, to the other side of the spectrum where it does that, but also is able to control the appliances in the apartment and load shift for you based on, you know, varying inputs, so time-of-use pricing or other.

And I think that is a technology and a measure that's being under deployed in this market that is ultimately going to be really critical going forward.

COMMISSIONER MCALLISTER: So who -- so this morning we heard about OhmConnect, you know, or we -- somebody mentioned OhmConnect. And that's one kind of market-based way to get what you're talking about done.

I guess are there other pathways and other offerings that are --

MR. BROOKS: Oh, yeah.

COMMISSIONER MCALLISTER: -- that are gaining traction in the low-income multifamily sphere?

MR. BROOKS: Well, the ones that we've been looking at in our -- the ones we have in all of the EPIC demonstration projects under one grant is a product called NEXI (phonetic) that is kind of the simple just light that is based on -- you know, it changes color based on a preset energy budget. It goes from green to yellow to red. So, you know, as the day progresses, as you get closer and closer to what your preset energy budget is, it changes color and people know when to stop using. There's another product, Emberpulse. I mean, there are actually quite a few --

COMMISSIONER MCALLISTER: Yeah.

MR. BROOKS: -- products coming out, SkyCentrics. And some of the have demand response capability integrated into them, and I think that's kind of the next wave of what we're going to be seeing as emerging technology on that front.

COMMISSIONER MCALLISTER: Are any of those being sort of sponsored or sponsored by the utilities or sort of an interface with the rate structure at the utility, or the smart meter or whatever, is actually driving the response -- or, you know, the color of the light or whatever?

MR. BROOKS: Not that I'm aware of yet. I could be wrong, but --

COMMISSIONER MCALLISTER: Yeah. So, yeah, that was really a question for Edison.

MR. DRESTI: Well, if I can, this doesn't really pertain that much to low-income, but it can.

We have a Smart Thermostat Program that we kicked out for demand response called Save Power Days, where it's probably the biggest bring-your-own-thermostat program in the USA. We have about 50,000 customers onboard using devices like Nest, Ecobee, so on and so forth. And they're demand response, so they pre-cool and shut down, very cost effective. I think that could work in low-income, except for one thing. And the biggest issue is Wi-Fi network capability within the structure. And that's something that Ram was mentioning. And that's -- I don't know how we get around that. You're saying that there might be some other thermostats that can do that.

But very quickly, we reliably get through independent MMV (phonetic) anywhere from 700 to 750 watts reduction when we call an event. The customer is not put out that much because they can just change the temperature whenever they want, and it seems to be a very reliable way to do business.

MR. NARAYANAMURTHY: Well, Mauro, I mean, maybe I'll add to that. I think that's a very valid point that you brought up that can be -- so there's the what you can do in the building shell and what you can do for the behavior of the tenants. And one of the challenges related to the low-income tenants is that they don't have Wi-Fi; right? So then a lot of the technologies that are based on Wi-Fi, right, whether it's connected water heaters, connected thermostats, they all struggle with that.

So again this is one avenue we're exploring, actually, through one of the EPIC projects, too, is actually looking at Bluetooth connectivity because the CPUC has the Lifeline Program which gives an Android phone to the low-income tenants. So what we're looking at is, okay, hey, if you can get to the phone, right, and use the phone as a way to communicate, whether it's rates, whether it's signals for devices, whatever it is; right? So that's one avenue that we are exploring because of the fact that I think in our experience we found maybe 15 percent of people have broadband, and even fewer have Wi-Fi.

MR. DRESTI: And that could work. Something like that could work.

So as a follow-up, though, real quick, to make it scalable, we use Open 8 Air (phonetic) that we helped -- that you guys helped us develop. And I think that's a great protocol to talk from a utility to devices, not rely on a manufacturer's portal and make it difficult to scale up.

COMMISSIONER MCALLISTER: Yeah. I would just -- I want to second that in general terms, that depending on proprietary approaches, it probably has some pretty large drawbacks. So if we can sort of -- if the utility can kind of, you know, shepherd the programmatic environment or programmatic approach to kind of getting into, you know, being relatively uniform and standardized about it --

MR. DRESTI: Yeah.

COMMISSIONER MCALLISTER: -- that would be good.

MR. DRESTI: The key aspect to the program is that we use an open source software to control the devices, but we don't particularly control devices. We work with the customer -- with the clients -- yeah, the vendor's proprietary network.

COMMISSIONER MCALLISTER: Yeah.

MR. DRESTI: But we hold them to a

performance contract, and that's all we really need to worry about, you -- we want this amount of DR, you guys figure out how to do it and make sure that the load is there.

MS. HARAMATI: The next question is kind of, you know, one of the general themes of the day, which is really around. I guess I'd like to pose this to Dave.

So you have sort of a unique perspective as being a building owner and operator. So in your experience, what are some of the barriers to broader adoption of innovative distributed energy resources? And I just want to take a moment to kind of say what those are because we talked about it at the beginning of the day. Eugene included it in his presentation, but -- and he didn't forget. And so we're looking at pre-commercial energy efficiency, demand response, storage, innovative solar, solar thermal, things that are maybe not as widely adopted already, and electric vehicle chargers.

MR. BRENNER: Yeah. So I think we are looking at all of those except storage, at this point. There's a lot of learning that has to happen, partly because there's a variety of different programs out there. There's a lot of unknowns in how this stuff is all changing so fast. And so we rely a lot -- like on the LADWP program, they were excellent in helping us understand things.

I think there's a lot, as far as the solar. We're really -- future rate changes and all that structure is really confusing to us. And like the V-dim (phonetic) process is really hard for us. And so stuff like that has really set us back a lot and so -- and partly, we have just too many of these things happening at once and we can't focus. I mean, this is not our mission. Our mission is housing, that's what we do. This is actually like fourth or fifth down our list of priorities.

So I think those things are the main thing that are holding us back.

MS. HARAMATI: And are there some solutions or things that you've seen that have worked, that have helped getting these innovative technologies into your buildings?

MR. BRENNER: I think the flexibility and kind of the holistic approach that LADWP took, it was sort of a bigger conversation of them helping us with a lot of things. If there had been more time on the timeline, we would have really taken a lot of their technologies that they had proposed. And I think the same is going to be true as the work we're doing with EFRI right now, is that we need a lot of time to understand this stuff. And the more they can show us demonstrations on controls and stuff like that the more we're going to be onboard.

MS. HARAMATI: Okay. Thank you.

MR. DRESTI: Okay, I'll talk to it in the context of multi-unit dwellings for the MUD folks.

I showed what was going on in Charge Ready, specifically, to show that we have had some successes but we really have challenges in trying to get electric vehicle chargers in these communities. The main reasons that we've had some problems were charging stations are really a low priority for the property owners. They really don't know how many people are going to utilize them. Customers may not be interested, that particular customer interest for electric vehicles at the time. And then there's other issues like parking management issues. As you go ahead and change out or touch a parking lot, you have to make it meet the new requirements. And that's sometimes a little more onerous than current property owners want to work with.

So I think what will help, what we did is that we had a couple of workshops with apartment owners, try to get them up to speed on what's going on. We really didn't have a lot of success at that. There wasn't a lot of interest. So we resorted to going out and having one-on-one conversations through our account managers with building owners. We had 147 of those in the past year-and-a-half, which resulted in the 35 charge stations we've put in.

So increased marketing does help. We need to, I think, also target new construction as the market grows because it's going to be lower cost, easier for us to install and bring down the costs of the devices. Possibly additional third-party incentives for used vehicles, for used EVs, that type of thing, so there's more of them out there. It's still a new market. Vehicles last about 11 years. Those are ICE (phonetic) vehicles, so EVs will probably last a little bit longer. And it's going to take a little bit more time for this market to get to this market segment.

MS. HARAMATI: Okay, great. Thank you.

So before we move on to the golden carrot question, I want to just return to heat pumps for a moment, since I know this is a topic of interest, and just pose the question to Ram and Andy, what could be done, in your opinion, to increase the adoption of heat pumps in the low-income multifamily apartments, given the cost issues with installation, the skilled labor that's needed, and also concerns about operating costs of switching from natural gas water heating to maybe a heat pump coupled with electric resistance heaters that could potentially increase the electric bill of the customer?

MR. NARAYANAMURTHY: So I think from an operating costs perspective, one of the things that we've been looking at is this whole concept, if you're doing a holistic upgrade, there are these constraints around how the property owner gets paid for or the rent gets offset for the utilities, using the utility allowance calculators. So when you do a holistic upgrade, sometimes it actually makes sense for the property owner to take on the entire energy use. And, in fact, that's my point of discussion we are having on how do you manage behavior?

So let's say you're putting in heat pumps and putting in solar at the same time, it might actually make sense for the property owner to make it a master metered property. That way they can manage and actually get the benefits of the heat pumps without passing the costs onto the tenants.

One of the other challenges we are seeing with heat pumps and water heaters is that the distribution system network, the electric distribution networks aren't designed for electrification. Most of the distribution systems are designed for gas water heating, gas space heating, and so there are some costs that we need to consider. And we have to figure out who pays for those costs, because the property owners cannot sustain those costs.

So today, I think one example is the Charge Ready Program where the utility is able to rate base the cost of increasing the infrastructure to provide the EV charging. And we might have to look at something similar for the heat pump side.

But overall, I think the opportunity for heat pumps can be high if we can manage the tenant cost, the occupant cost through some kind of a financial mechanism.

MR. BROOKS: And I would just mainly point out about, in terms of the potential for increased costs associated with heat pumps, that's still pretty speculative at this point. We don't really know whether that's going to be the effect. And so far we've been somewhat heartened by the projects that we have been able to do post-utility analysis on that we've done fuel switching from gas heating and space heating and water heating to heat pumps. And again, we don't have a very large pool yet, but of the projects that we've seen the interesting tidbit has been that the utility costs have actually gone down, and that's before we've actually even turned on the PV system and before we've adjusted their utility base, their gas heating baseline.

So those are two things that are going to -- you know, for all the LIHTC (phonetic) projects where we're doing fuel switching, we're also doing solar at the same time, so the solar is going to offset the increased electric load anyway. But even without that, across the board, when you switch from gas heating to electric heating, you go into a different utility tariff. And that, even without those two things enabled, we've seen on the couple of projects that we've done the analysis that bills have come down.

So I wouldn't say that that's necessarily going to be the case across the board, but it may not be as much of a concern as people are thinking.

COMMISSIONER MCALLISTER: Well --

MR. DRESTI: And there's a --

COMMISSIONER MCALLISTER: -- oh, go ahead.

MR. DRESTI: Sorry. There's another piece, too. Thats for natural gas. But some customers are served out in the valley by propane, which are -- oh, sorry, that's the case, so --

MS. RAITT: Use your microphone.

MR. DRESTI: Yeah. It sounds -- sorry, I was just in the moment here.

Some customers are actually fueling their heating through propane, which I understand is far more expensive in terms of dollars per BTU.

COMMISSIONER MCALLISTER: Uh-huh. I wanted to ask just about the health and safety aspects of, you know, of combustion generally, but also, well, just is there -- I mean, it seems like there is a benefit, indoor air quality and just health and safety generally. Is that a real thing that you perceive from customers or in any other way?

MR. BROOKS: It's definitely a real thing in that we've done combustion appliance testing on thousands of --

COMMISSIONER MCALLISTER: Yeah.

MR. BROOKS: -- wall furnaces and furnaces and they fail. You know, they're still in combustion gases back in the department. There are natural gas leaks all over the place.

COMMISSIONER MCALLISTER: Yeah.

MR. BROOKS: So it is definitely a real thing. Whether it's a perceived thing and whether it's leading to health consequences from the residents, we don't really have that data, or at least we don't have that data, but I suspect that it is. And it certainly is a valid reason for removing them.

MS. STOVER: One component of our LIFT pilot is the fuel switching component. And with that we're -- we'll be doing pre-monitoring and post-monitoring of the equipment, so we'll be measuring the emissions onsite before removing the gas equipment. We're also doing pre-surveys and post-surveys of residents, so hopefully through this we'll be collecting some data on the perceived impacts of equipment.

COMMISSIONER MCALLISTER: Great.

MS. HARAMATI: Great. Thank you. So I guess now we'll turn to the golden carrot question, which I think is kind of the question that's on everyone's mind.

And so what are the main barriers that we've heard about? It's the lack of bandwidth for multifamily building owners just in terms of time and being able to get their attention and kind of say this is something that is worthwhile and, you know, there's money to be had, it will improve the value of your buildings.

So I guess maybe we'll start with Dave, and then go to Ram and Andy, and others can chime in.

So what does a delicious golden carrot

look like to building owners? You know, what can we offer them, we as government or the utilities, to convince landlords and building owners to want to do a retrofit?

MR. BRENNER: Yeah. I guess I think for us, it's just a combination of there being some way to capture a portion of the revenue, and then mixed with technical assistance which builds up a little bit of confidence in the technologies that we're putting in. And if you can get those two, it doesn't have to be a lot of revenue coming back, it doesn't have to be a ton of technical assistance, but a little of the two can put a project together really quickly.

MR. NARAYANAMURTHY: In our experience, I think the concept of a one point of contact, I think PG&E calls it the program concierge concept, where a property owner can go to one person who can manage both the utility programs, the non-utility programs, and bring in financing packages together so that the property owners don't really have to break their head thinking about it.

MR. BROOKS: And, yeah, I guess would agree with that, the kind of one-stop-shop model has been talked about a lot. I think picking up where Martha mentioned, I think the next kind of iteration of that is really moving more towards the notion of like a clearinghouse-type concept, and this is actually something we're experimenting with right now. We have a variety of funding sources coming in, all to deliver energy efficiency and solar. And we have building scientists out in buildings all day long but they -- and so they're able to identify health and water and other related issues, but we don't have the same pool of funding to offset those things. So we can identify them, but we can't help necessarily address them.

The notion of having a clearinghouse where program -- regional program administrative agencies can kind of plug into that, you know the energy efficiency programs and, you know, take out what metrics they want, so if it's a health agency and they're looking to reduce the number of asthma-related ER visits, I mean, that's the metric that they're going for, they can put money into a clearinghouse, put their funding into a clearinghouse and pull out those types of benefits. If it's, you know, the number of projects that tighten their envelope down to one ACH and install heat recovery ventilation, you know, that could be the metric by which they're trying to -- that they're trying to achieve.

But I think the notion of pooling sources of funding that are beyond just energy, not just -- you know, we've already got some solar and efficiency combining now which is great, those two had been siloed for so long, now at least we've made some progress there. But if we can move on to integrating those health dollars and structural assessments and other kind of housing-related program dollars into a more central location where building owners not just access the technical assistance but the funding, as well, through a streamlined mechanism, I think that's probably the next evolution of that.

COMMISSIONER MCALLISTER: How much are you -- how many jurisdictions that you work in have programs to sort of update the healthy stock, you know, lead paint abatement and just kind of general refurbishment?

MR. BROOKS: I think they all have some version of that.

We're working with -- we just started a

project with the Santa Clara HCD. And their objective is to lower the operating costs of affordable housing in their jurisdiction. So it’s not necessarily energy efficiency, it’s lowering the operating costs however they want. They wanted to tap into the BAYREN Program, which is one of the programs that we implement in their jurisdiction. But in their jurisdiction, they have a municipal electric utility, so they could only get a portion, only the gas funds, from the BAYREN, and that wasn’t enough. So what they’re doing is taking their housing dollars, and they’ve also reached out to the municipal utility to come into this and basically layer those dollars on top of the BAYREN infrastructure.

And so their main objective really is to lower the operating costs, to do any work that will do that, and they’re layering their dollars on top of the energy efficiency programs, so it’s kind of a light version of that. And I think every jurisdiction has some funding available for those types of things.

COMMISSIONER HOCHSCHILD: You know, Mikhail, you mentioned the sort of golden carrot for the building owners. I think it’s also a golden carrot for policymakers here, specifically with the heat pump question, which is that unlike energy efficiency and unlike rooftop solar which reduce the number of kilowatt hours procured from utilities, heat pumps actually increase it; right? Because most of the costs of the system are fixed, you're spreading those fixed costs over a greater number of kilowatt hours. And it is a downward force long term on electric rates.

And the same dynamic is true for the 5 million electric vehicle goal where Commissioner Scott is leading. That will increase electric load by eight percent, and you have a downward force there on rates over time. I think it is useful to track that, or at least to do some estimates for heat pumps, as well.

I don't know, Commissioner McAllister, if anyone is making those kind of --

COMMISSIONER MCALLISTER: Yeah. So the thing is that depends on them not pushing up the peak; right? Because the driver of a new (indiscernible) that would then force rates up would be, if you had the -- you know, if it forced, you know, an expansion in peak capacity.

And so that's, you know, your point,

Andrew, about making sure the shift load or, you know, basically, load shape in a way that improves load factors, you know, is really critical to making this whole thing work. And so I think that if we're -- any initiative to adopt heat pumps at scale would really have to come along with demand response. It's just integral to the program, you know, particularly if we're going to subsidize this, it's like we've got to subsidize it in the right direction.

COMMISSIONER HOCHSCHILD: Right.

COMMISSIONER MCALLISTER: So --

COMMISSIONER HOCHSCHILD: Right. Fair point.

MS. HARAMATI: Those are all the prepared questions we had.

Do the Commissioners have follow-up questions, or Advisers?

COMMISSIONER HOCHSCHILD: No. I just wanted to thank all the panelists. There's really tremendous work happening across the board. You guys are doing terrific stuff, so keep it up.

COMMISSIONER MCALLISTER: Does Sandy or --

COMMISSIONER SCOTT: I have one question.

COMMISSIONER MCALLISTER: Yeah? Go ahead. I have one other question, but I'll come back to it.

COMMISSIONER SCOTT: Okay. Yeah. Mine is not necessarily a question, but there's a lot of really good information here. And I think to the extent that you and others around the audience and folks how are listening in on the WebEx have specific examples of things that worked really well that you can provide for us, or specific examples of things that just were a disaster and here's why, so don't run down that path, I think that will be helpful as we're trying to really think through how to put all of these components together. And we have lessons learned at the Energy Commission from some of the programs and projects that we have funded, but there's a ton of experience out here.

So just to kind of get nuggets from you on that I think would be really helpful. And I know we're at the end of time, so I won't ask folks for that right now. But if you'll send that into our docket or get that to us, that would be really helpful.

COMMISSIONER MCALLISTER: Cool. So I want to just come back to a point I started to make in the morning, but just in terms of -- so, you know, you all are operating at the local level, you know, most of you and -- well, three out of five, at least. And the Edison and Ram, you're participating in these projects. And so I wanted to just see, really, or ask about the best way for local, state -- sort of local/regional/state collaboration to take place? I mean, you guys are down at the project level, you know, drumming up sort of interest and lessons and really doing stuff, you know, learning hard-won lessons.

And, you know, I just want to make sure that we develop the structural -- our collaboration has legs to it for the long term, such that we build in the communications up and down the chain so that we don't miss things that are being learned on the ground and get them into policy in a relatively expeditious way and can feed those back, you know, help facilitate the learning across local jurisdictions. You know, if you're in Fresno, you're learning a bunch of great stuff. Well, how do we make sure that the

Bakersfield and the Redding and every place else kind of can build on what you're learning?

So think sort of structurally about how this conversation ought to continue. And then sort of at the local end of it, how the local entities that are doing the work on the ground can be best supported? And, certainly, that's resources, we all know that, but also just enable that in any other way too.

So Adenike, do you have any questions now? Okay, great.

Sandy? No. Okay. Great.

Thanks very much.

MS. RAITT: So we had scheduled a break, so we can take a break for 15 minutes. Back at 2:45.

(Off the record at 2:30 p.m.)

(On the record at 2:49 p.m.)

MS. RAITT: Let's go ahead and take seats and we'll get going again. I know it's always hard to get started again in the afternoon.

COMMISSIONER MCALLISTER: Okay, everybody, we all want to get out of here on time, okay, so let's get moving.

MS. RAITT: Thanks. So we have a

presentation from Ted Lamm at UC Berkeley Center for Law, Energy, and the Environment.

MR. LAMM: Good afternoon. My name is Ted Lamm. I'm a research fellow at the Center for Law, Energy, and the Environment. Our programs work with stakeholders in state, local government industry, and advocacy to address California policy issues across the energy and environmental spheres.

Our Climate Change and Business Program is a collaboration with UCLA School of Law and Bank of America. And since 2009, we're produced over 20 policy reports on issues ranging from renewable energy to transportation, energy efficiency, land use and more.

This is some background that I think you all are very familiar with. As part of this series, earlier this year we identified the low-income multifamily energy efficiency sector and issue as an area that we could apply our resources. And specifically, we aim to build on the recommendations of the SB 350 Barriers Study with input and assistance from a number of people in this room, including but not limited to Eugene and Mike and some Energy Commission staff. And we based our project, which is ongoing, on the structural and program barriers that you see here, which I think everyone is pretty familiar with, but in particular, split incentive problem, market delivery issues, and program integration issues came to the fore.

So this spring we convened a group of stakeholders in a convening model that we use frequently, which is a facilitated discussion that surfaces consensus solutions that we can then compile into a public research report. So we had 20 participants representing key state agencies, utilities, housing developers, and advocates, et cetera.

And the format that we use is the group collectively describes a vision of their ideal system for financing low-income multifamily energy efficiency retrofits. The group then identifies challenges to the creation of that system, proposes and discusses a wide range of solutions, some of which are consented, some of which create some disagreement to overcome those challenges. And then sometimes we prioritize really near-term high-priority action solutions that can be achieved in the near term.

So this was the six-part vision that the group identified. As you can see, the vision that the group identified aligned not only with the Barrier Study, but also much of what's been presented today.

The first item, number one, was a single entity for energy efficiency program administration. It's not possible to eliminate all complexity, as Isaac and others have demonstrated throughout the day. The sector is, itself, very complex. Layering efficiency and financing for efficiency on top of that is doubly complex. And there's a reason that current multiple programs exist. But participants described a vision where even if all that complexity can be packaged in one place so that users and consumers on the front end essentially don't see it and it's all, perhaps, behind the curtain, that could substantially increase uptake of efficiency programs.

Number two was long-term funding for state efficiency programs. The owners and developers in the group consistently emphasized the long-term and comprehensive way that they do their planning across all of their projects for a property or set of properties and their desire to include efficiency retrofits in that long-term planning process, and the need for long-term secure funding opportunities if they're going to do that.

Number three was aligning financing opportunities with renovation and refinancing plans that exist outside of the efficiency sphere. Low-income, and particularly subsidized buildings, can have very complex financing restrictions, and also limited capital. And funds that are made available by the state need to be available at the trigger points, whether it's refinancing or a standard renovation on a 10- or 25- or 30-year timeline. The funds need to be available then, so that they can be used at the right moment.

Other items in that vision were guarantee the minimum retrofit performance to minimum the risk, widespread owner, tenants and program access to building energy data, which AB 802 and the Los Angeles program described earlier are beginning to address, and that's to inform not only to get information to owners and developers to initiate projects, but also for those who are contemplating projects to prioritize the retrofits that make the most sense and are most cost effective in a limited capital environment.

And then finally but not at all least importantly, support for tenant benefits and protection of affordable housing to ensure that current tenants aren't displaced and to ensure that non-monetary benefits are accounted for.

So in identifying challenges to achieving this vision, it is, in fact, an inverse, to some extent, of the vision. So in general, a lack of program coordination across the four or five multiple programs that currently exist, which are implemented by different staffs in two or three agencies, plus the utilities.

Number two was a lack of reliable long-term public funding, as discussed, to facilitate the integration of energy efficiency retrofit planning into long-term property planning.

And number three was a lack of confidence in savings, which goes to performance guarantees or other mechanisms to ensure that savings actually occur, as well as a lack of confidence in non-energy benefits which is the accounting for benefits that don't accrue in direct benefit savings.

The solutions that the group came up with ranged pretty far, and we've just got a couple of highlights here.

Unsurprisingly, number one is the creation of some form of single statewide one-stop-shop program administrator that's been discussed, I think, by every panel and most speakers today. It's not a simple solution, but that was the one that came back to the top multiple times.

Another solution was considering the utility tariffs that involve shared benefits between utilities and customers.

And third were the development of metrics that really establish the value, whether it's in monetary or other terms, of non-monetary benefits such as quality of life, public health. And even a number of participants emphasized the importance of simple increased pride and sort of ownership in rental properties that are not always -- may not always feel that way to their tenants.

And in discussing these solutions, a potential program model that came to the fore from one of our participants is a program implemented right now in Arkansas, which is called E-Utility (phonetic). It's an independent B Corp that operates a comprehensive energy efficiency retrofit program on behalf of a number of rural electric cooperatives and municipal agencies. And they've been able to, based on a relatively small program, they've been able to achieve a lot of the sort of one-stop-shop goals that different participants identified and that others today identified. And they really, they begin with the initial customer engagement all the way through implementation, and then down the road, verification.

And a couple of key items that their representative highlighted that have made their program successful is they go as far back as possible in their benchmarking so that data really relate as much to the property as possible and as little to the individual tenant or occupant as possible. And the State of Arkansas has created a state loss guarantee fund to support any retrofits that don't generate savings. So that was an example that we're looking into further to see how applicable it could be to California and ways in which it might be adopted.

And another note on the third point here, the non-monetary benefits, this was an item that our participants across all state agencies and advocacy groups and housing developers all emphasized, which is the importance of accounting for these benefits which, as I said and as was discussed on the first panel today, really cover everything from public health to quality of life to, it would be very important also to consider, the most low-income customers who are perhaps under-using energy right now because they simply can't afford it and who, if given increased access to efficiency programs, might actually increase their use and identifying the customers for whom that is actually a good thing and where that should be considered a benefit.

So our next steps in our process are to organize follow-up discussions with owners and developers and reform proponents to really identify detailed elements of a one-stop-shop solution, to try to hammer out what that might look like in California. And as Commissioner Scott mentioned earlier, trying to identify things that have worked really well, and also things that have really not worked well, in order to produce a pretty robust idea of what that program might look like. And then by the end of this year, a public research report which will include all of these findings, as well as supporting research.

There's my contact information, if you have any questions. If the Commissioners have any questions, I'd be happy to take them. Otherwise, thank you very much.

COMMISSIONER MCALLISTER: Great. Yeah, thanks. I thought the convening was excellent. I really, really want to give CLEE (phonetic) and Nathan (phonetic) and you're team kudos for doing that. And I'm really optimistic that's going to produce a solid report that we can use.

And maybe if you could sort of highlight the opportunities to provide input going forward? You sort of did that, but maybe you could be a little bit more --

MR. LAMM: Sure.

COMMISSIONER MCALLISTER: -- sort of concrete for people who want to participate, who maybe weren't at the convening.

MR. LAMM: Absolutely. Yeah. So we're in the process right now of scoping out a follow-up convening which will roughly follow the format that I described to you for our prior convening. And what we're really looking to do is to bring in a group of low-income multifamily owners and developers who have implemented efficiency projects in the past that, as I said, either have been successful or unsuccessful and can present case studies, essentially, that we can use to inform the broader solutions that have been proposed by our group. We already have a couple of developers who have agreed to work with us on this project. And we'd love to get a couple more in the room so we can have a robust list.

So I encourage anyone who is interested in joining to contact me and we can talk about bringing together that event.

Thank you.

COMMISSIONER MCALLISTER: Great. Thanks very much, Ted.

MS. RAITT: So next is the third panel of the day to discuss Encouraging Investment and Market Adoption.

So if you're on the panel, please come up to the front table. We have seats for you.

MR. LEE: Good afternoon. This is Eugene Lee back again. This is Panel III regarding Encouraging Investment in Market Adoption.

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So the purpose of Panel III is to discuss the potential strategies to increase the financing opportunities to improve the energy performance in multifamily buildings and including ways to better utilize the incentives and attract additional capital.

We're joined today by several panelists, and I'll allow them to introduce their organizations and their respective roles.

MS. CARRILLO : Good afternoon. My name is Deana Carrillo and I'm the Executive Director of the Alternative Energy and Advanced Transportation Financing Authority. We're a State Treasurer -- or we're a financing authority under the State Treasurer's Office, currently collaborating with the Public Utilities Commission on an Energy Efficiency Financing Hub, so that's part of my role here today is we monitor multiple programs.

MS. WANG: Hi. I'm Steph Wang with

California Housing Partnership. And we are experts on how -- on affordable housing finance and technical assistance, with also a specialty in sustainable housing, focusing on energy and water improvements, working with our nonprofit affordable housing partners and housing authorities to help them access energy efficiency and clean energy incentives and financing opportunities.

MR. CIRAULO: Good afternoon. I'm Rich Ciraulo with Mercy Housing. I'm the director of -- Regional Director of Portfolio Syndication. And Mercy Housing is a local subsidiary, a California subsidiary of Mercy Housing, Incorporated, which is a national affordable housing developer, actually one of the largest affordable housing developers in the country. Mercy Housing California is a developer, owner, property manager and service provider of the housing that we provide. We have 132 properties in California consisting of 8,800 units, serving about 18,100 residents. And our portfolio is sort of broken down, about 49 percent family, 31 percent senior housing, and 14 percent supportive housing.

MR. HODGINS: Good afternoon. My name is Dave Hodgins. My company is Sustento Group. We get hired by local governments, nonprofits, utilities to design and deliver efficiency programs at scale. L.A. Better Buildings Challenge is one that takes up a lot of my time these days, a lot of work on policy implementation development, standards development, as well, supporting that work. And ultimately it's about, you know, market engagement. We try to do the hub single point of contact thing in L.A. and happy to share our experience on that. Everything that we've experienced has been consistent with a lot of the research and experience that's been shared today.

MR. JORGENSEN: Hi. I'm Lane Jorgensen with MGG Properties Group in San Diego. We're a multifamily investment and management company. We're fully integrated from property management, asset management and construction management. I've had the ability to lead energy and water efficiency retrofit projects at several of our properties in California. We've done about over $4 million worth of projects, both on affordable and market rate housing in California. And we've implemented a number of strategies to finance that, and we're pleased to be able to talk about that experience here today.

MR. LEE: Thank you very much.

One of the discussions that we've been having relates to low-income housing tax credit properties.

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And there are approximately 4,800 properties in the state of California assisted by low-income housing tax credits. And of those properties, and this is all available through the state Tax Credit Allocation Committee, there are approximately 3,500 that are placed in service that are essentially occupied. They're running right now. And this bar chart actually identifies the growth of those tax credit properties in California.

Next slide.

If we're to take a profile of the construction type of those properties, you will see that a majority of them are new construction at this time. A sizeable portion does relate to that acquisition rehab wedge which is almost 40 percent. And that translates to about 1,700 properties. And if we were to take those acquisition rehab projects and then look at another slice of them, of those that were actually placed in service in 2006 through 2008, it's important to understand where they lie with respect to their climate zones, and if they're located in disadvantaged communities, and maybe by their housing type.

We had parsed out just south of 200 projects. And the reason why we had chosen this '06 to '08 is recognizing that a triggering event is that rescindication. And if developers were to actually contemplate rescindicating at year 13, let's say, what would it actually look like?

Next slide.

So this is an identification of those projects by their climate zones. So you will see in these extreme climate zones, most of them are in the Central Valley, 47. We have some in the central-Central Valley, also, and the inland valley is 71.

Next slide.

If we were to look at this portfolio through the lens of the CalEnviroScreen from the California Air Resources Board and those that are in the highest percentile of those disadvantaged communities, they layout as follows. You will see that many of those disadvantaged communities are in Southern California, San Diego and Imperial, and a swath in the Bay Area, as mapped.

Next slide.

This slide relates to the actual number of rent restricted units of them. And you'll notice that according to these bars, they're very large developments, 50 added to nearly 500 units. That's a large swath.

Next slide.

And this is their profile. Because we're speaking of not only buildings but behavior, correct, and who actually lives in them? So this slide indicates they're composed by large families. We've got seniors. And within the other, we have single-room occupancy households and populations that are considered at risk. I hope this information has been helpful.

Next slide.

Proceeding to Panel III. So what I'd like to start, before we begin our discussion, is again to frame this because I'd rather not have a discussion only about money in a vacuum. But I think it's really important that we recognize about beginning with the end in mind.

I recall a conversation I had with a very successful housing developer. And I was just impressed by the number of affordable housing that he has created and managed. And he said -- and I asked him, where do you begin? What's your formula, your success formula? And he answered very plainly, he always imagined, where would my mother live? It's a very simple test. And so if it passed the mother test to him, it was good enough, it was the right development.

And I think that really sets us up for our discussion today, how do we begin with the end in mind? How do we move investment and market adoption with a specific type of vision. And our first question relates to when should building owners consider energy efficiency retrofits and financing?

And I'd like to ask Dave your thoughts on this question.

MR. HODGINS: Yeah, absolutely. I think that this is really the key to the efficiency conversation, whether we're talking about multifamily affordable housing or, really, any type of retrofit project and trying to find out kind of how far are we from the recapitalization, rescindication, refinancing event, and getting ahead of it. Our experience -- and getting far enough ahead of it that you can actually make a difference. I think there's a small window where you have the focus, you know, that this is coming up, but decisions haven't yet been made about, you know, specifying equipment. You know, how deep are going to go with this? So trying to get the conversation within that window, and then trying to come into it with as much information as possible.

For buildings that are in the middle of that 13- to 15-year cycle, having a conversation about deep retrofits, financing, someone spoke earlier about the complexity of the capital stock on these types of properties, is not likely to be productive in our experience. It's more those types of properties that are mid-cycle, maybe you could have a conversation about direct install type opportunities, you know, really low or no cost opportunities.

But if you're talking about, you know, deeper retrofits, you have to catch that window where a deeper renovation is on the horizon and you can talk about incremental opportunities for efficiencies, and then bring in programs like weatherization program or EUC or other. But the timing is really key there, and it's a small window, I think.

COMMISSIONER MCALLISTER: Mr. Hodgins, can I ask a question here?

So I think the analysis that Eugene and his team has done is great. And then just, you know, focusing on the 2006, you know, okay, well, they're 13 -- 12 years out. They'll soon be thinking about the rescindication process. Now is the kind of time to get in there. So there are 200 properties that are in that window. And maybe for 2006 it's, you know, 50 or 60 properties. Not all of those properties, am I correct, are going to be sort of in that bad a shape where they really feel like, okay, I'm going to invest in a deep-deep retrofit, or I'm going to get all the tenants out of there and, you know, really do something important.

What's the process by which you would suggest, you know, how to sort of figure out which properties are the ones that ought to be approached and that we ought to really worry about and end up with some subset of those ones that are up for rescindication as good candidates to do something important?

MR. HODGINS: Yeah. Absolutely. Something that we did in Los Angeles with some funding from Energy Efficiency for All and the support there was to try to get at that question and kind of combine datasets. So we were able to get some information from our Department of Housing and Community Development, they have a $6 billion loan portfolio in the city, looking at the -- get the name right -- the National Housing Preservation Database, try to get some information from there, as well as from TCAC, and try to get a sense for what those buildings are, and then what other datasets can we access and overlay with that?

So UCLA created something called the Energy Atlas, working with DWP. I think Nancy touched on that earlier. So we were able to work it out with them to get access to get access to the actual utility data, and then combine that with assessor data to get at year built, where possible, look at renovation history, and really spend the time on the planning phase to figure out which buildings are they and who owns them? Who are we trying to talk to, when about what? But it was an over a year process putting that study together, combining those datasets and synthesizing that into a hit list.

But what that showed us what that, consistent with what Eugene was showing at the state level, was that there were concentrations of large buildings with high energy use intensities and where they are. And in L.A., those in South L.A. and Watts, and in the Valley. And so now is the process of bringing together the relevant programs, trying to package those in a way so that when we do sit down, we have a sense for what the timing is and what's likely the nature of the opportunity before we walk in.

COMMISSIONER MCALLISTER: Great

MR. HODGINS: Yeah.

MR. LEE: Are there others who would like to chime on discussion?

Stephanie?

MS. CHEN: Yes. And I found this really helpful, Eugene, trying to like get into the data.

My team, also, at the California Housing Partnership tried to do a little analysis ahead of this, as well. And we tried to look more recently, you know, how many TCAC rehabs actually happened statewide in the last few years, found a low number of 22 in 2017, slightly higher, 57 in 2016, 39 and 2015, and 37 in 2014. And we were looking at this not only for this workshop, but also thinking about, as we're ramping up, getting ready for the Solar and Multifamily Affordable Housing Program, how much would we be specifically focused and targeting these sorts of projects, versus how much are we going to have to look broader; right?

And those numbers were low enough that it was a reminder that while it is a really important time to be thinking in terms of, you know, their major recapitalization timeline, our team, you know, has good experience working in the Low-Income Weatherization Program outreach, also just trying to time things with other mid-cycle improvements. You know, are they going to be doing a major roof replacement? Did they think it was a good time to go solar? Did they really need to save some money on water bills?

And so we definitely think that that supports a lot of what the discussion's been -- we've been having today, which has been about how do we make sure that we're combining our outreach; right? Because when they're looking at making another improvement is when they -- is the best time to reach them to make an energy efficiency improvement.

MR. LEE: Others?

COMMISSIONER MCALLISTER: Do you have -- do you know when that's going to happen? I guess the advantage of the TCAC Database is that it's like, okay, hey there, you're 12, you know, we should engage with them.

And so I guess, what would be a similar analogous kind of trigger for outreach in the case where they're doing, you know, a new roof or something? I mean, you know, they're -- when they go out to get bids, you know, there's something. You know, when they want to get a permit from the city, like is it -- you know, I guess I'm wondering sort of what would be the in for a program to sort of engage with that property?

MS. CHEN: So instead of trying to reach

them at the trigger, as Dave was saying, we reach them ahead. We talk about their whole portfolio once. Every time, we develop a relationship with the affordable housers themselves and work through their longer-term timeline. The way they think about their entire portfolios anyway, they're not planning -- I shouldn't be speaking for Rich or anyone, but our experience is our partners are not just planning one project at a time, they're planning their whole portfolios.

And so it's really hard to catch people exactly at a trigger moment, so instead we have to do our outreach and keep our databases, our outreach and engagement databases, up to date on their longer-term plans and when to touch back with them.

COMMISSIONER HOCHSCHILD: Rich, do you have something to add about that, when you actually assess your portfolio?

MR. CIRAULO: It's definitely an ongoing process. And we've actually working with the HPC (phonetic) to sort of help kind of analyze some of the specifics. And, actually, when I get to my part, I'll talk a little bit about a program that we're actually implementing right now across our portfolio that I think speaks to this, so I'll just kind of leave you in suspense for that.

MR. LEE: Well, you're up.

So the second question is: What are the cost consideration and amounts needed for meaningful energy improvements, and why, recognizing we had our discussion and we acknowledged that there isn't just one profile in this very large multifamily universe? So there isn't a magic number?

But, Rich, if you could get started on that?

MR. CIRAULO: Yeah. And I think sort of my response doesn't really have specific sort of numbers, but maybe that will kind of come out of the general conversation. But there were a couple of things that I thought would be helpful just to put out there. And sort of hearing some of the other conversations, I think you probably heard some of this before, but I wanted you to hear it from Mercy Housing, affordable housing developer.

So first off, I just want to say that we want to building sustainable housing. And implementing energy efficiency strategies is very consistent with providing truly affordable housing and lowering the cost by reducing utility costs, and basically the overall housing costs.

And so, you know, often we are constrained by the funding availability and the escalating costs of construction. So projects are designed to cover operating costs and pay supported debt, but rents are highly regulated and constrained. Most projects do not generate excess cash flow, and so project reserves are used to pay for sizeable capital improvements, things like roofs, siding, windows, HVAC systems. And so there are really two instances where we're really kind of looking at the details of the cost considerations, and it's when a project is potentially undergoing significant rehab and we're seeking new funding.

And so as part of seeking that new funding, we're looking to meet the -- and usually when we're talking about that, we're talking about tax credits, and we're seeking to meet those program requirements. And the other one is when we're looking at portfolio upgrades and ongoing replacements.

And so when we're looking at projects

that are undergoing significant rehab and financial restructuring, there's usually a menu of options that we're looking through. And so that many options is what we're taking to our team and working through and sort of define, you know, our low-hanging fruit, those things that are, as we go through the Greenpoint (phonetic) checklist or the LEED checklist, those items that are easier to achieve without adding significant cost to the project. And so that's sort of the first focus and the first discussion that's being had.

And then we're looking to make smart choices that -- so then how does that come out as smart choices, like making LED lighting upgrades or looking at low-flow fixtures, again, not high cost but high impact items?

And then the conversations get a little more different when we're looking at those items that will cost the project but, you know, looking to have those fit within the overall budget, and will still provide long-term benefits. And in those instances, we're looking at like window efficiency, roof efficiency, adding additional insulation. And so that's kind of a point in time that I think we've discussed a little bit where these items get brought up and sort of, you know, weighed into the overall project budget.

When we're looking at existing portfolio upgrades, we try to make the best replacement decisions based on the funds available, which is not always the easiest call. For older properties, it's often difficult to choose the more expensive energy efficient option. But some of the newer TCAC projects have requirements to make those replacements in line with the original efficiency goals, so that's kind of built into some of the reserve analysis and what we're thinking about, sort of for the future of those projects.

For the older properties in our portfolio, Mercy has been working on a program that does not have a significant capital outlay or increase operating costs. It's relatively new to us, but it's work that we're doing with the Affordable Community Energy Services Company, or ACE, and Bright Power. And so what that program is doing is allowing us to do energy efficiency upgrades that are being paid from savings. And so essentially, you know, we're achieving lower energy usage, increased tenant comfort, and providing capital improvements with minimal impact to project reserves and operating expenses.

And essentially, one of the drawbacks, unfortunately, is if the project doesn't translate to reduction in energy costs and operating costs for the property, since it's a pay-from-savings, but, as I mentioned, we are able to reduce the property's carbon footprint, improving tenant comfort, and providing for some no-cost property upgrade.

So that's just a quick overview of some of the energy measures and costs that Mercy considers.

MR. LEE: Thank you, Rich.

Other who would like to contribute to this question?

COMMISSIONER MCALLISTER: Can I just chime in, or ask a question, actually, just digging in a little bit, Rich, on your answer there?

So you know, as you said, a lot of this is complicated and, you know, there's a lot of regulations, you know, and sort of the costs can go up, and it's not clear how you sort of make that -- turn that into benefits while still complying with regulations and all that, and so, you know, not just energy regulations, but a broad swath of things you guys have to do, so I'm very sympathetic with that.

And so I guess my question would be, what -- what sort of collaboration or cooperation, whether it's some kind of, you know, easing of the regulatory burden or, you know, cash money or, you know, financing support, what are the sort of things that would get your attention as a developer in terms of collaboration from the state or from a state program or some kind of policy initiative to take on sort of a bigger lift, whether it's that rescindication or, you know, in mid-cycle or, you know, sort of a year-to-year upgrades of your properties? And sort of do that with, you know, feeling like it was really worth it, like you were really moving in the right direction and, you know, locking arms in a productive way.

I guess, you know, I don't want to be -- I don't want to come to this with any illusions about how effective the state can be on this.

But if we're going to do an initiative or we're going to think about initiatives, we want to really make them work. We want to make them knock the ball out of the park. And so, you know, what does that look like to you?

MR. CIRAULO: So cash is always great, you know? But --

COMMISSIONER MCALLISTER: I have no doubt.

MR. CIRAULO: -- from a more pragmatic perspective, I think that one of the things that we're noticed is that there are many different efforts sometimes happening that we're sometimes pulling in to try to be the hub of, so in terms of identifying those potential incentive programs that are out there that really fit, you know, with the projects that we're working on, understanding the different requirements of the different programs and trying to sort of aggregate them into one place so that we can either feed it over to our architects to incorporate into the design, or to have those conversations, you know, with our contractors around what those things would cost.

And so one of the things that we're

talked about is almost like a one-stop-shop consultant, is how we've thought of it in some instances where, you know, we work with HERS raters, we work with energy consultants. But none of those folks that we've run into so far really have that broad perspective and really could sort of help us get that, you know, put all those different pieces together to be able to move forward and know that we're taking advantage of those programs that are already in existence and applying them to the projects that we're trying to move forward.

COMMISSIONER MCALLISTER: Is there kind of -- so I guess I'm imagining, you know, scenarios where you're sort of, okay, here's the minimum bar we have to get over to -- you know, we have to do some energy efficiency to get access to the tax credit allocation financing, but, you know, beyond that it's kind of a tough sell maybe. And, you know, what is the -- what would soften that blow or what would sort of motivate you guys to say, okay, you know, actually, this time around we're really going to do a deep retrofit, or we're going to go the distance and do more; right? Because, I mean, long term, we've really got to -- every opportunity we've got to take advantage of. 2050 is not that far away. You know, it's two rescindications or it's, you know, maybe one refi of a private sector building.

So I guess, you know, think. You don't have to answer now or, you know, in depth, but just I think those kind of bold initiatives, you know, are really what we need to consider, you know, all the incremental stuff, you know, along the way but also really deepening it when we have a chance.

MR. CIRAULO: The one thing I would say to that is that what we find ourselves often doing is, you know, figuring out how to get the minimums that, you know, we need to, and the funding, but with basically a direction to the team to look at like our contingency as we go through construction and try and identify those items that we can reincorporate into the project.

So I guess my real point is that you've got a very willing and sort of interested party in trying to get to those goals, and that we try to do it as best we can with the funding that we have available.

And so, an example of the rehab, you know, we go into it very conservatively because we don’t know what we’re going to find when we start pulling the walls off --

COMMISSIONER MCALLISTER: Right.

MR. CIRAULO: -- and things like that. But if we’re lucky and things are not so bad, then we can then refocus and look at additional energy efficiency upgrades that we try to incorporate into the project if, you know, there were additional funding sources that allowed us to make those. And sometimes making those decisions in the middle of a rehab is not the best time to do it --

COMMISSIONER MCALLISTER: Yeah.

MR. CIRAULO: -- because you’re incurring additional costs sometimes in rework or in kind of having to rethink certain strategies. And so if we knew that up front, then we could plan better and, you know, incorporate those efficiencies more definitively.

COMMISSIONER MCALLISTER: Okay. Thanks.

MR. JORGENSEN: I would add a little bit do that.

In our experience, we did some midownership cycle energy and water retrofits on multiple properties in the So Cal REN (phonetic) territory. And that opportunity was originated by a third-party group that was incentivized to try and go get construction work.

And so they had developed an expertise in aggregating the program -- different programs and the different incentives that were available to different programs through So Cal REN, primarily. And they said, okay, So Cal REN has a temporary allocation to go do energy audits, so we're going to go -- here's a list of your buildings, we're doing to go do no-cost energy audits on all those buildings and we're going to come back to you with the findings. And if we feel like there are good opportunities that provide a return on investment, we're going to recommend that you go forward with it.

And so it was in alignment in the sense that there was no out-of-pocket cost from us to evaluate what the options might be. I came from kind of a developer type of group that had integrated the energy analysis and tracking and incentive tracking to put a package together that they could then go out and execute on and, you know, make money being a contractor to install those projects. And so, you know, we ended up going forward.

You know, one little hitch there that we were able to overcome uniquely is that, you know, there was substantial up-front costs to the retrofits prior to any rebate monies being received. We were able to basically use our company balance sheet to front that, but not affordable housing owners would have that vehicle.

But just as an example, you know, sort of free energy audits for everyone and, you know, maybe some temporary financing vehicle until rebates come in, based on our experience, would accelerate and illuminate what opportunities might be out there, both market rate and affordable housing.

MR. LEE: Okay, our third question relates to financing strategies and the combination of funding sources, and which ones are most successful, and why?

Lane?

MR. JORGENSEN: So just kind to add some context for people that maybe aren't completely familiar with how we look at a multifamily property from an investment point of view is that there's the physical structure, the units, the improvements, and then there's the legal and financing structure that David, you know, called the capital stack, and that's what we call it, the capital stack. And so you have investor equity and you have mortgage financing as part of that capital stack. And those create obstacles, but that's also where I have found most of the opportunity to do retrofits is when there's a change in that capital stack.

And like we've talked about with LITAC (phonetic) deals, they're on kind of a 15-year cycle. And so if they're 100 percent restricted on their rents, too, you don't have a lot of value appreciation. So it's very difficult in 100 percent of affordable properties to ever have an opportunity to adjust that capital stack.

Where we have found some initial success are on some of the older mixed-income properties, often times from the 1980s when there were bonds and credits issued that then resulted in a deed restriction on the property specifying, you know, 20 percent of the units be made available to affordable housing residents of a certain income threshold, or 40 percent.

And because of that existence of that deed restriction the property qualified for more aggressive incentives to do energy-efficient retrofits or water-efficient retrofits on the property. And the existence of the, you know, 60 to 80 percent of the property being market rate allowed the property to appreciate in value. And so as a private capital investor, we were able to, you know, create transaction -- investment transaction events, whether it’s a purchase or a sale or a refinance, to go after those projects.

And so, you know, one of our first projects was a solar-thermal project on a 300-plus-unit property where we refinanced with HUD. And that refinance event on an appreciated property allowed us to pay for all new roofs that was a prerequisite to being able to do the solar-thermal project. And, you know, again, we had the refinance proceeds to front the $400,000 of cost of the solar-thermal project until the rebates came in. And so that was a very successful project.

Likewise, we did a solar PV system on a

400-plus-unit property that had an old regulatory agreement on it through the prior MESH (phonetic) program, and that was a PPA, a very difficult project. Implementation was very challenged with both the lender and, you know, the utility. And in that case, we ended up basically taking a separately metered property and turning it into a master metered property so that we could monetize the benefits of the solar production and pay for the PPA payments that are required.

COMMISSIONER MCALLISTER: Okay. Interesting. So let me, not being a finance guy, let me see if I can just state this in simplistic fashion.

So there actually is some benefit or some potential upside of having a mixed building where some is low-income and some is not low-income because you have the appreciation upside that you can then leverage when you refinance it?

MR. JORGENSEN: Yeah, absolutely. You know, I think that's a great model for a lot of reasons because it provides inclusive housing and brings people of different incomes together. And so I feel like, you know, some of the properties I'm most emotionally proud of are those that are mixed income because, you know, rental housing is just a very natural place for people to, you know, be at different points in their life when they're trying to, you know, climb out of different economic situations, or if they need a respite. And so those mixed-income properties are really very powerful and they're financeable. And the transaction events occur more frequently on them. We're losing them because the regulatory agreements are expiring --

COMMISSIONER MCALLISTER: Yeah.

MR. JORGENSEN: -- and there's no mechanism to continue that or replace that financing that also replaces the deed restriction. So as a state, we've lost a lot and we continue to lose them. You know, we've lost a couple that way, too.

But from a private equity standpoint, we're indifferent. I mean, it's very difficult for us to invest in 100 percent affordable because those properties don't appreciate. But if it's a mixed income, it can be a very viable opportunity. And because of the deed restrictions the rebates have been more aggressive, which further helps support the projects.

COMMISSIONER MCALLISTER: That's really interesting. Thank you.

MS. ADEYEYE: I had a question about the last piece that you mentioned, when you said you took the project that was separately metered and made it master metered. Do you have a sense of how that affected the tenants or what happened in terms of their build or in terms of their experience of that project moving forward?

MR. JORGENSEN: The tenant bills went down. Because of the nature of the PPA, they didn't go down as much as if the solar system had been fully paid for, separate from a power purchase agreement kind of financing mechanism. But basically what happens is because the meters exist, we can separately meter those tenants' usage directly on how much they actually use and then shift the net metering credits from the solar production to them according to their usage. And so they pay a lower rate on the solar production than they would to the investor-owned utility.

MS. ADEYEYE: So in the end, they still got the kind of net energy metering benefits?

MR. JORGENSEN: Yeah.

MS. ADEYEYE: Okay.

MR. JORGENSEN: And on the financing front, one thing I wanted to point out, too, in our multifamily space, Fannie Mae and Freddie Mac are huge lenders. And they have Green Financing Programs. And I think one of the more exciting things that has happened in the last few years in multifamily space is that there's been tremendous uptake and adoption of the green financing. And it's basically standard business operating procedures for us at this point in time. Some stats are that in 2012, Fannie Mae started their Green Financing Program.

It was not designed particularly well, so it was very slow out the gate, but in 2014, they did $130 million. In 2017, they did $27.6 billion of green financing around the country. Freddie Mac went from $3.3 billion in 2016 to $18.7 billion last year. And for Fannie Mae, it accounted for almost a third of their total multifamily loan production, and for Freddie Mac, about a quarter. These stats are just off their website. And so almost, you know, over $46 billion in financing. And what that financing does is, for owners like us, it says, okay, if you go in and you retrofit this property that you're acquiring or financing, reduce either water or energy use by 25 percent, we'll reduce your interest rate.

And so what's really brilliant about this solution is that it overcomes the split incentive problem because the owner, who is taking on the obligations of the financing, realizes the benefit of the lower costs of debt, but the engineering-based improvements required at the property are whole building, and so they accrue to the tenants where there is low-flow showerheads or LED bulb replacements. And so it's a very -- it's just, you know, a huge uptake by the industry to do this.

COMMISSIONER MCALLISTER: So I wanted to sort of build on something that Rich said, and then what you just said, and really pose the question: Is there opportunity for a state-level initiative to kind of piggyback on some of this?

Like as long as you're in a building and you're getting a bucket list, you know, you're getting sort of a punch list, here's all the things we could do on this building, and we're going to draw the line here because -- you know, do all the stuff above that because we have capital constraints or because whatever, you know, hassle factor, you know, no low cost or whatever, you know, and so, you know, if it's 25 percent savings.

So what -- you know, is there an opportunity to sort of go and get that next 10 percent and the next 25 percent of something to, you know, go further, you know, based on some initiative that we could define as a state while you're at it, basically, you know, and put some more resources on it?

MR. JORGENSEN: I think there's the opportunity for that. You know, it's debt to us, but for Fannie and Freddie, it's equity. There are, you know, there are secure ties to mortgagers' obligations, and so they go out and sell them, and so there's certain complications to it.

But, you know, for a state the size of California with the amount of business that's available here for them, I would think that there's some capacity for the state to interact with them in a way to further the level of rehab. Because, you know, we're doing the easier, lower cost things because those are the things that make sense. But to go for the deep rehab, you know, the models from days gone by that would seem to work would be more of the, you know, kind of bond financing deals where you bring in, you know, bond financing, with our without tax credit allocation --

COMMISSIONER MCALLISTER: Right.

MR. JORGENSEN: And, you know, add private equity or some other source of equity to a project to do a deep retrofit and that just becomes part of the bond obligation. But somehow --

COMMISSIONER MCALLISTER: Oh, I see.

MR. JORGENSEN: -- the financing on the bond has to be lower than a market rate to be appealing.

COMMISSIONER MCALLISTER: Yeah. Yes. I'm just -- I'm barely -- I'm just barely following you at this point. But I think if we could turn it into -- if we could something equity-based, you know, and sort of make it as similar as possible, then maybe everybody's better off anyway. I want to throw that out there. If anybody has any beautiful ideas and has a business model for this, that would be great.

Anyway, I'll let Eugene take back --

MR. CIRAULO: If I just can add one quick to that, which is that when thinking about some of these programs, to maybe work with some of the existing agencies, because there are so many layers --

COMMISSIONER MCALLISTER: Yeah.

MR. CIRAULO: -- of financing and sort of different, you know, battling regulations and, you know, issues that we end up having to sort of untangle. It would be good to them sort of in concert with some of the programs that are in place.

COMMISSIONER MCALLISTER: Yeah.

MS. CARRILLO: And piggybacking off that a little bit, I think the other thing that we're hearing from folks on the financing side as we develop affordable multifamily pilots is that really something, an off-balance sheet,will really be effective with the TCAC projects and other really debt -- complicated debt stacks, so looking at those energy service agreements or the power purchase agreements, or even equipment leases. I think there's some innovative things coming out on -- instead of energy performance guarantees, but actually looking at subscriptions of some other way to off -- it's the new term to offset that cost of services for energy.

COMMISSIONER MCALLISTER: So turn it into, basically, an operational cost, more or less?

MS. CARRILLO: In essence, not necessarily guaranteeing the performance, but having enough of some wiggle room on the performance to be able to have a regular revenue stream.

COMMISSIONER MCALLISTER: Yeah.

MS. WANG: I think another interesting thing that I was exposed to the other day was kind of crowd funding for solar, which isn't new, but this was for tenants and multifamily tenants where they created what they call kind of a syndicated on-bill repayment program for solar to offset some of the technical costs. So I think there's a lot of innovative strategies for both the developers themselves, and some new ones opening up for tenants directly.

COMMISSIONER MCALLISTER: Interesting.

MS. WANG: Adding to that, it’s hard to figure out when do these questions end and the next ones start? But basically, I think I’ve also been hearing a lot around the need for flexibility, because you’re talking about -- nobody here has said, oh, I would like to finance that specific authorized energy efficiency measure; right? I mean, I think we’re talking about, well, you’re in -- you’re doing the work. Maybe you can do something else where you can deepen your efficiency or water savings? And it’s not -- it doesn’t neatly fit into the program check boxes.

And I think that echoes a lot of what was said earlier today, which is it’s really hard to build off the old -- a lot of the legacy programs. It’s not, you know -- well, you know, I guess we can name names, but basically we’re -- basically, what we’re trying to get at is anytime you say, well, you can include this type of measure but not that, that gets in the way. Every -- whereas, if you say whereas some of the other programs out of Cap and Trade, for instance, did not have to start with that because the agencies did not start with, you know, 30 years of building up lists of approved measures. Instead, they could just say any sort of energy or water savings, we're going to go by the metrics of what's saved instead of specific measures. And then you really open up the opportunity while you're in there.

MS. CARRILLO: I think the other point that you've made before, Stephanie, is not only just the specific measures but the arbitrary lines of eligibility. So, you know, you might have an affordable housing project, you know, on the other side of the street, but it doesn't cross over that one line to be able to provide that incentive, in other words.

MS. WANG: And I understand. We're a state that has to prioritize our dollars.

COMMISSIONER MCALLISTER: Yeah.

MS. CARRILLO: But I think some of these arbitrary silos that we create, you know, they're self-created, let's go change the world, and here's an obstacle course that your mother created for you, to go do it. You know, it's just one of those things that, to the extent that we can bust down those walls, it would definitely make projects easier.

MR. HODGINS: Yeah. To pick up on that, and I think one of the previous speakers mentioned it, too, was just the pebble in the shoe, to borrow Eugene’s comment, the income verification piece. When tenants have already been income verified in order to live in certain types of properties, to have to then go do that again in order to actually qualify for certain programs, like direct install programs, I think in practical application becomes a really big barrier.

And so I’m sure there’s a reason that rule is there, but if that’s something that can be revisited and opened up, you know, would it be possible to just rely on the income verification that’s done up front in order for a tenant to be in a building and just determine that, okay, this building is eligible for these programs.

And you can take some of those -- and those are more, you know, legacy programs that are more measure based and prescriptive, but take those projects out of the scope for the more flexible programs, like the Cap and Trade, you know, Low-Income Weatherization Program, or where you’ve got, you know, proceeds from a refinancing or rescindication, take those measures off the table that can be done for free through a prescriptive measure-based program and make that process really simple, so that income verification piece just simplifies. Take those projects that you know make sense off and then let the flexible money be flexible.

MR. LEE: Thank you.

We have our final question, and that is: How can we improve and expand increased investment? So we've spoken about flexibility, looking for those opportunities, even if they're just incremental changes in programs.

But, Stephanie, do you have other ideas?

MS. WANG: Yes. And I'm only going to share two because it's getting late in the afternoon.

So one of them, many have noted, and thank you for whoever added it into the CLIMB Action Plan, the need for long-term stable funding for existing programs. You never -- you can't really have property owners and industry relying on programs when the funding is really unpredictable, but I think that's been covered a lot, so I'm going to keep moving.

The other one, we’ve started to get into some of the energy performance risk issues. And I think there are actually a lot of ways that, you know, that those of us who are in these rooms and get to give input on program design can help to address this. I mean, there are the tougher -- there are the tough questions to address around, you know, how do we improve projections of energy performance? And how do we encourage operations and maintenance, better operations and maintenance business models? And, you know, how do we change tenant behavior? And people often times go straight to the really harder pieces.

But there are models for, you know, requiring -- if you have an incentive program, think of it as -- I love that in the CLIMB Action Plan, it says -- it puts us in the Consumer Protection Category. I love that. This is not just some abstract problem, this is a consumer protection problem. And in which case, you can -- you know, we can say when this program -- when a program provides state incentive dollars, that, you know, that it can include consumer protection, whether it’s, you know, contractor guarantees that the product will perform as expected, or whether it's incentives covering some operations and maintenance services, or other.

There are a lot of opportunities that I think many of us are exploring. And I'm excited that we are getting, I feel like in California, we're getting a lot more, getting beyond just saying the energy performance risk is a problem quietly, and saying, hey, you know, there are ways that our programs can be designed to tackle that head on.

MR. LEE: Others?

MR. HODGINS: Well, to add to that, I mean, there are also -- I have a lot of experience with performance contracting. There's also insurance products on the market now that are pretty competitively priced, based off of either the project value or the amount of savings that are, you know, projected to occur.

And I'd be curious to hear, you know, the other panelists or others in the room, what their experience has been. But mine has been once we explain that and sort of how the equation works, which is basically just a regression analysis, and most business people are familiar with what that is, they use that type of approach to project all kinds of things, different investment options, they're like, oh, I get it. Forget it, let's just do the project. You know, by the time we actually go about quantifying the risk and they say, okay, well, that's going to be another two percent of project value, I don't need it, so -- but it does exist.

And to the extent that -- I'm curious if other people have seen value in that or had a similar experience?

COMMISSIONER MCALLISTER: Well, I mean, I'm intrigued by that just because, I mean, we have been funding and working on and trying to sort of give some impulse to some of these analytical approaches in our world, you know, in the energy efficiency program world; right? Maybe we should be partnering more aggressively with kind of the actuarial community to sort of, you know, have them sort of bring their expertise to this because I think it's kind of a new and different thing for the energy efficiency, you know, business, but not for many other people. So maybe that's a good approach.

MR. JORGENSEN: Just one example with the Fannie-Freddie Green Financing Programs, they don't actually require performance, and so it makes it very simple. They require completion of the program based on the timeline agreed to, to complete the whole building retrofit project. But it's an engineering-based study, an estimate of projected savings, and so we typically don't run into that issue.

For the projects that we've done midstream, that maybe are just funded out of cash flow or reserves, that's definitely more of a concern in terms of are we actually going to receive the energy savings projected that were used to justify this expense from precious, you know, cash flow and operating reserves. And they haven't all worked out. Some of have worked out great, but not all have.

COMMISSIONER MCALLISTER: What do they qualify as a green project? So is there -- I mean, you just check the boxes, it's got this and that, and you're done?

MR. JORGENSEN: For their loan programs, they recently -- well, for 2018, they increased the energy reduction standard from 20 percent whole building to 25 percent whole building, but it's energy or water. So the engineering study is part of the financing process, whether it's an acquisition or a refinance. It's a third-party study. And they actually pay for most or all of the report as part of, you know, what you -- I mean, ultimately, the borrower pays for it but, you know, they compensate you for the cost of that particular engineering study. And then that's what they use to make the determination. So you have Energy and Water Measures 1 through 20, that's kind of your menu of options, and then you choose those that are most cost efficient to meet their thresholds to qualify for the incentivized financing.

COMMISSIONER MCALLISTER: Okay. Great.

MS. WANG: I will just quickly respond again to the insurance question. Our experience is that off-the-shelf, it's not affordable right now for this purpose and for this market sector. But, you know, I think we continue to be interested in whether, if this opportunity grows and is -- and is developed, whether this could work, because we really like the idea of not every individual property owner not having to be the insurance themselves.

MR. LEE: Thank you.

Other questions?

COMMISSIONER MCALLISTER: I think we're good. Great. I would like to thank you -- go ahead. Do I have -- Jeanne, you have a question, A question about that? Yeah? Go for it.

MS. CLINTON: I have a question.

COMMISSIONER MCALLISTER: Jeanne, you might as well just come up and stay up.

MS. CLINTON: Jeanne Clinton. These are just four quick clarifying questions of points that people on the panel made that I think would be helpful to get answers to.

Let's see, for anybody, this whole discussion about the 15-year recap and refi period, does that apply in general to all of the low-income multifamily housing that we're talking about or only the deed-restricted rent-assisted housing?

MS. CARRILLO: (Off mike.) Just TCAC.

MS. CLINTON: Just TCAC? So we're talking about the 5 percent rather than the 26 percent of -- the two wedges of -- it was like 5 or 6 percent of this low-income multifamily was rent assisted and 25 percent was market rate. So this 15-year thing is only for the smaller wedge; is that right?

MS. CARRILLO: So the deed-restricted issue is specific to the affordable -- the deed-restricted affordable (indiscernible).

MS. CLINTON: Which makes it rent assisted, doesn't it?

MS. CARRILLO: Right.

MS. CLINTON: Yeah. So I just want to point out, clarifying that we're only talking about 20 percent of the housing stock in which low-income multifamily residents live? Okay. Just that clarification.

Rich, you said that a hub of information was really helpful to the developer. You've had some experience with this, but it sounded like it wasn't perfect yet in terms of the hub or single point of contact assistance. What would make it more perfect?

MR. CIRAULO: So I described the hub as sort of what we would like to see. So the experience we've had so far is disjointed pieces that we might be, you know, achieving tax incentive rebates for a PV system. We might be working with SMUD or PG&E, depending on the service area, for their incentive programs. There are other programs that are out there that we probably don't know about.

And so it's like kind of having someone -- and again, we refer to them sort of as someone we'd be happy to kind of bring in as part of our project team that could handle sort of doing that piece of the work for us, because we don't -- you know, we will sometimes delve in and try to find something that will fit and, you know, can work with the project that we're trying to develop. But that's a lot of energy and time that we don't necessarily have.

And so having sort of a clearinghouse or, you know, somebody that we can say here's our project, what are the different programs that would fit, that's really what we would prefer.

MS. CLINTON: Okay. Great. Thanks. Two more.

Mr. Jorgensen, you were talking about Fannie Mae and Freddie Mac. And what market segments or circumstances of the multifamily housing is eligible to take advantage of the Fannie Mae and Freddie Mac financing that you were talking about. Is it everybody or is it only people who meet certain qualifications, besides the 25 percent energy and water reduction?

MR. JORGENSEN: Sure. Fannie Mae and Freddie Mac are government-sponsored entities, still, officially now since the Great Recession, part of the government and Treasury, actually being quite profitable for them. So really any property, any multifamily property, I mean, you know, they provide a lot of liquidity in the single-family home market. But they have a multifamily segment that's, you know, a thriving, productive, low-risk business right now where they issue loans through, you know, a broad network of originators called -- in Fannie Mae language, they're called delegated underwriters and servicers.

And so, you know, five-unit properties, you know, Freddie Mac has a small balance program in particular. They go after seniors. Both agencies have a lot of focus on trying to get financing out for affordable housing with a focus on incomes below 50 percent of AMI in any given jurisdiction around the country. So, you know, they don't probably finance one- and two-unit properties, but they're broadly available for a large part of the market.

The one place where they probably are not active would be in the tax credit syndicated world where you have the 100 percent affordable, and maybe Rich can speak to this, you know, they might pursue that business. But in the past, those have typically been a bond and credit combination on the capital stack for the 100 percent global projects. And so typically you're going to have some sort of governmental agency issuing the bonds, as opposed to Fannie and Freddie. In days gone by they used to provide some liquidity enhancements and some other things on those bonds, but they haven't been in the bond business in a meaningful way since the Great Recession.

MS. CLINTON: Okay. Thanks. The last clarifying question.

A couple of you folks talked about how you hate measure-based programs. And I got the sense that there was a preference for performance-based programs. So I'm wondering if anybody want so clarify in terms of what would some kind of performance-based eligibility, in terms of the savings level, be a better approach? And if so, what kind of minimum?

MR. HODGINS: I mean, I think we need a combination because, you know, every owner, every situation is different. And so I'm a big fan of, you know, performance-based programs for projects and for owners where that makes sense and there's the capacity and the time to do that, but that's not everybody. And so having, you know, measure-based direct-install type of programs is also important if we're trying to catch a big slice of the market. Not everybody can do it. And when you get into smaller buildings, too, the engineering starts to get upside down relative to the savings. And so you need, you know, a simplified approach for simple, small buildings.

MS. CLINTON: Anybody else want to comment, add on? Okay. Thanks.

Thank you, Eugene, for letting me --

MR. LEE: Okay.

MS. CLINTON: -- seek a few clarifications.

MR. LEE: Absolutely. If there are any other questions?

Hearing none, thank you very much, Panel three.

COMMISSIONER MCALLISTER: Thanks everybody.

Thanks, Eugene.

MS. RAITT: So next we have Jeanne Clinton to give us a wrap up of the workshop.

MS. CLINTON: So I was asked -- this is Jeanne Clinton still. I was asked to give a recap on two kinds of things, one, themes things that we heard today, and separately, needs. And I've given myself permission to think of needs in two ways from what I heard today, one, needs for additional work or innovative or progress, as well as needs for more comments. So I'll go through this quickly and I'll do it in the order of the day.

So from Panel I, some of the themes that I was hearing, or number one -- so Panel I was data for anybody who's tuning in late in the day. One theme was it's hard to get consistent, as in consistently defined, clean data from multiple sources in order to use it in some meaningful way.

Another theme related to that was we need relevant data that's disaggregated and targeted. And then the third aspect of conveying information, not just data but information, is to use trusted agents, such as health home-visit practitioners, community-based organizations, housing rental inspectors, where we start to see sort of communication collaboration at the grassroots level across what we've previous thought of as siloes.

And then two of the needs that were identified going forward is the need to give more attention to who and in what role of who gets what data in terms of owners, managers, accountants, occupants, contractors, that that needs some more thought. And also the need in the context of information data to capture all the benefits, not just the energy or the non-energy, but to capture all benefits and to get away from the siloing of energy and non-energy.

Then I'll move to Panel II which was focused on innovative technologies. And there, I have a few themes. One was that the stacks of different rules, definitions and time frames get in the way of innovative.

Secondly, that determining cost

effectiveness is a particular challenge for this market segment, or sometimes referred to as hard-to-reach market segments in general. And being cost effective is also difficult because of the constraints on the ability to deliver other co-benefits, unless there's an opportunity to get pooled funding from those other worlds, such as health or housing structure repairs.

A third theme that I heard on the technology side was the need for solutions to be easy to manage by the owners and managers of properties, as well as by the participants. And there was a lot of discussion on the single point of contact or a one-stop shop or concierge as a way to help with this ease of management on solutions.

Some of the needs that I heard identified commonly in this panel were the need for in-unit communication technology solutions, particularly if there's limited Wi-Fi. Would Bluetooth be an answer, or do we need common protocols, so sort of working on the technology side of communications? And also a cautious reminder that as we do onsite electrification upgrades -- well, as we want to do electrification and/or add

EV charging, there is a challenge of doing onsite electrical system upgrades, that it’s going to have a cost associated with it in order to absorb the capacity of the increased electrical demand. And obviously, that depends on time of day, as well.

Then moving to the CLEE presentation, to me, you know, Ted nicely had two slides with common bullets that culminated from 20 peoples’ common themes from their convenings: one, the lack of program coordination complexity, that’s been a general theme today; two, the lack of reliable long-term public funding; third, the lack of confidence in savings, which also, I would say, connects a little bit to performance issues and insurance product issues, we can start connecting the dots.

And then in terms of top solutions, again, Ted pointed out the one-stop shop, the need for metrics to get at measuring and valuing what, in that group, they call the non-monetary benefits, such as quality of life improvements. So that ties back to some of the metrics and data in health that we heard earlier.

And in Ted’s presentation, he identified a newish item that was the desire for some sort of utility tariff arrangement to fund or finance retrofits in which the customers or occupants would somehow share in the payments and benefits arrangements.

And then that brings us to the third panel where the common themes that I was writing about were in terms of timing, of when to go after major or deep investments, that at least in a certain market segment, one has to pay attention to the 15-year refi and recap recycles. And there are opportunities to talk about some serendipitous opportunities for upgrades if some sort of, you know, major system is going to be replaced, such as a new roof, that might happen outside of those 15-year cycles.

And then again, in terms of how to increase investments, three things emerged, again, the hub and single point of contact idea, the need to move to more performance-based sort of accountability rather than always having to go with measure-based systems, and the need for easier or proxy means of income verification, so as not to be an extra burden on the owner and manager.

And then finally, one of the themes that I kept hearing from the dais today was inviting people to, in their comments, to submit real examples of good solutions that are out there for some of these many themes that we had. Where is it being done, not necessarily on a large scale, but where is it being done successfully? What are good models? And inviting folks to put that information into their comments so that it can help these agencies further as they think about what kind of initiatives that they want to support.

So that's it. Thank you.

COMMISSIONER HOCHSCHILD: Great. Thank you, Jeanne.

It looks like we have one public comment, at least, from Nehemiah Stone, Stone Energy Associates.

MR. STONE: (Off mic.) I'm going to assume, since I'm the only public commenter, I can ignore the three minutes.

COMMISSIONER HOCHSCHILD: Brevity would be much appreciated.

MR. STONE: If I can't get through this in three minutes, I hope you'll give me some room.

First, I want to thank --

COMMISSIONER MCALLISTER: You also have -- you have written comments that you can submit, as well, so --

MR. STONE: That --

COMMISSIONER MCALLISTER: -- yeah.

MR. STONE: -- that would take me a half an hour, so I won't go through all the comments.

A strong request from the TCAC executive director I want to ask you to please fund a validation study for CUAC (indiscernible)?

COMMISSIONER MCALLISTER: I'm sorry, what is COAC?

MR. STONE: The CUAC.

COMMISSIONER MCALLISTER: Oh, right.

MR. STONE: The CUAC is the California Utility Allowance Calculator, which you own. You paid for it and you maintain it at this point. And it's used -- it came up a number of times. And it gives a reasonably accurate of what tenants are going to pay for utilities.

Although it has been shown to be very accurate compared to billing data, for most affordable multifamily projects some data indicates that it’s significantly less so for older, existing buildings, and for new construction in very hot regions, Climate Zones 13, 14 and 15, for example. The issue appears to be with the accuracy of the building performance software from which the heating and cooling data comes from not from the CUAC itself because it doesn’t calculate those internally. So that’s CBAC RES (phonetic), EnergyPro, et cetera. That’s what would need to be validated for this.

My second comment was about something that Andy already covered, so I’m not going to get too far into it, but I want to make a couple comments on it.

Devices like the NEXI, and the only reason I’m using the name on that is I don’t know the name of any of the other devices like it, they give the tenant information about their energy use in a way that is useful for low-income tenants. We can’t expect them to be looking at tables of data on their iPads or computer screen, or even on their bill. This gives them colors, it tells them what’s going on, and that also gets past any language barriers.

The third aspect is one of the reasons

there's a confidence gap is that software tools currently do not reflect reality in multifamily buildings, especially low-income multifamily buildings. Is it truly reasonable to expect that households struggling with finances will have the same thermostat set points as the quote average household? When expectations of savings are based on pre- and post-upgrade analyses that assume winter setting of 68, a summer setting of 75 in both cases, and the tenants were only able to afford 62 in the winter and maybe 80 in the summer until the building was fixed, we're not going to see expected savings materialize. It's neither the contractors fault, nor the programs fault.

The CEC needs to commission a study to see what the typical set points are in multifamily housing and affordable housing and then make adjustments to the models. Performance guarantees came up a number of times today. This directly effects performance guarantees.

To really move the multifamily market, this is my fourth comment, to really move the multifamily market toward energy efficiency, we will need to give perspective renters information about the energy use in similar apartments. All else being equal, a renter would prefer lower utility bills. Homebuyers get similar information from a HERS report. Potential buyers of multifamily buildings will soon be able to get that, you know, building performance data through the new benchmarking program. But renters are the ones that we're leaving out of the equation at this point.

The influence that will really motivate multifamily building owners to make upgrades is potential renters speaking with their feet. The CEC already has the basic tool that could be used, the CUAC. However, for it to be truly credible to potential renters, there will need to be a neutral third party, not the building owner, and preferably not the government, standing behind the accuracy of the numbers.

One final comment, in Panel II a question came up, what can we do to overcome barriers to scaling adoption of clean energy tech in low-income multifamily?

My strongest suggestion is to work much more closely with TCAC on their regulations. Their regulations used to be stronger in terms of requirements for energy efficiency, both in terms of minimum construction standards and competitive points. And it seems odd to me that the collection of state agencies that are involved here does not include TCAC and SIDLAC (phonetic), who are the -- provide the largest amount of funds for both affordable and new construction and affordable renovations in the state.

COMMISSIONER MCALLISTER: I'm going to humor you.

Could you turn off the flashing red light please? Thank you.

So has tax reform in any way affected the availability of tax credit financing?

MR. STONE: Has what?

COMMISSIONER MCALLISTER: Has tax reform at the federal level impacted our state level availability of tax credit financing?

MR. STONE: It's too soon to see whether or not. But at the same time that some tax reductions went in place for corporations, California got a larger portion of low-income housing tax credits, so --

COMMISSIONER MCALLISTER: Actually, maybe I should have asked Lane that, but, oh well.

MR. STONE: So I think those things are offsetting.

COMMISSIONER MCALLISTER: Okay.

MR. STONE: At the times when it's the most difficult the tax credits go down to like $.80 cents on the dollar. At times where things are looking really good for low-income, they're over $1.00 per $1.00.

COMMISSIONER MCALLISTER: Yeah.

MR. STONE: Right now it's at about $.92 to $.94 a dollar, so --

COMMISSIONER MCALLISTER: Okay.

MR. STONE: -- and that's pretty average.

COMMISSIONER MCALLISTER: Okay. So you all set?

MR. STONE: Any other questions?

COMMISSIONER MCALLISTER: I think that's it.

COMMISSIONER HOCHSCHILD: Thank you, Mr. Stone.

Is there anyone else in the room who would like to make a comment? All right. Thank you. We're adjourned.

MS. RAITT: Oh, we do have one on WebEx --

COMMISSIONER HOCHSCHILD: Oh, on WebEx.

MS. RAITT: -- who's been waiting.

COMMISSIONER HOCHSCHILD: Oh, yeah.

COMMISSIONER MCALLISTER: Do you want to make any wrap-up comments or anything?

MS. RAITT: So --

COMMISSIONER HOCHSCHILD: Go ahead.

MS. RAITT: -- Tom Phillips.

And if anyone else on WebEx wanted to make comments, please raise your hand.

Go ahead, Tom.

MR. PHILLIPS: Hi. Yeah, thanks for the great discussions all day. I'll try to make a couple brief points and submit comments later.

And mainly, I guess, focusing on vulnerable populations from the health perspective, we know that our elderly population or aged or whatever you want to call them now is growing quite a bit, and as well as other populations, like those with diabetes and obesity and so on. So when you look at the statistics, about half of the population is going to be very sensitive to heat exposure, and they're going to be indoors more and more.

So when we look at the health co-benefits of energy efficiency, they are becoming more and more important because of the demographic changes, and with climate change and overheating in California. And when you look at the coastal areas, what is it, 90-plus percent of the homes don't have air conditioning. So in terms of carbon, we can't afford to really air condition those homes without trying to reduce air -- improve energy efficiency first.

So what I would highly recommend is trying to piggyback on other programs, such as weatherization or healthy homes programs, to add some mitigation and adaptation measures for handling extreme heat, you know, whether it's external shading or cooling booths or whatever.

And a few other quick comments. One growing co-benefit of energy efficiency and preventing overheating is liability. It's already been (indiscernible) for (indiscernible) up in San Francisco. It's a real big landmine, I guess, for any kind of building planning or retrofit where you're trying to prompt performance for not only energy, but thermal comfort and so on.

And so I think you can do a lot to

prevent those problems by thinking about it, applying the change and the increase (indiscernible).

And lastly, in terms of targeting any data, you need to look at vulnerable platforms, where they live, and then the conditions of the housing. And this is already being done in (indiscernible) where they can overlap that data to really target where they get the best bang for their buck in terms of carbon reduction and energy savings, as well as the public health of (indiscernible).

So thank you very much.

COMMISSIONER HOCHSCHILD: Thank you.

Is there anyone else in the room or on the phone who would like to make a comment?

MS. RAITT: So, yeah, so folks on the phone, if you're on the phone lines, if you'd like to make a comment, we'll open up the lines now. And if you didn't want to comment, please mute your line. Okay.

COMMISSIONER HOCHSCHILD: Okay.

MS. RAITT: So I don't think we're hearing any comments.

COMMISSIONER HOCHSCHILD: Okay. With

that, we'd like to thank all the stakeholders here and staff, and especially our colleagues and friends from the PUC for joining for a terrific and fruitful discussion, and we're adjourned. Thank you.

(The workshop adjourned at 4:18 p.m.)

REPORTER'S CERTIFICATE

I do hereby certify that the testimony in the foregoing hearing was taken at the time and place therein stated; that the testimony of said witnesses were reported by me, a certified electronic court reporter and a disinterested person, and was under my supervision thereafter transcribed into typewriting.

And I further certify that I am not of counsel or attorney for either or any of the parties to said hearing nor in any way interested in the outcome of the cause named in said caption.

IN WITNESS WHEREOF, I have hereunto set my hand this 25th day of July, 2018.

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Eduwiges Lastra
CER-915