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CALIFORNIA ENERGY COMMISSION

STAFF WORKSHOP

In the Matter of:	)	Docket No. 19-IEPR-06
	)	
	)	STAFF WORKSHOP RE:
2019 Integrated Energy Policy	)	2019 California Energy
Report	)	Efficiency Action Plan
	)	

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CALIFORNIA ENERGY COMMISSION

SAN DIEGO PUBLIC UTILITIES DEPARTMENT

MOCII AUDITORIUM

9192 TOPAZ WAY

SAN DIEGO, CALIFORNIA

WEDNESDAY, MAY 1, 2019

10:00 A.M.

Reported by:

Martha Nelson

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PRESENTATERS

Jan Bear, City of Glendale Building Official

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John Zwick, San Diego Gas and Electric

Pamela Birkel, Cascade Energy

Alex Kim, San Diego Gas and Electric

Lindsey Hawes, Center for Sustainable Energy

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Anna Lowe, San Diego Association of Governments

Heather Werner, City of San Diego

Cory Downs, City of Chula Vista

Peter Armstrong, Wakeland Housing and Development

Sochiata Vutthy, Community Housing Works

PUBLIC COMMENT

Cory Downs, City of Chula Vista

John Hanacek, Can Cover It

Lindsey Hawes, Center for Sustainable Energy

Nadine Spertus, Solar Turbines

Jan Bear, City of Glendale

Magini Ahmadi, CanTech Industries

Scott Ashton (via WebEx), Oceanside Chamber of Commerce

Renee Yarmy, Port of San Diego

AGENDA

P R O C E E D I N G S

10:04 A.M.

SAN DIEGO, CALIFORNIA, WEDNESDAY, MAY 1, 2019

MR. KENNEY: Welcome to and to adding input to our upcoming 2019 California Energy Efficiency Action Plan.

Just general housekeeping for those of you in the room here. The bathrooms are out the main two doors to your right. There are exit doors clearly labeled all around the room.

So we're here today to, as I mentioned, get input into our upcoming action plan covering energy efficiency across several different sectors, residential, commercial, agriculture, industry. And to do that we've been traveling around the state to hear different regional takes on what are best practices, recommendations, what challenges are people facing. So we've made it to our final stop here today in San Diego. We've been to San Francisco and Redding, Fresno and Los Angeles, so we've learned a lot along the way and we're excited about what we're going to learn here today.

I wanted to first go over what we can

expect to see throughout today's workshop.

So we'll have some opening comments and an overview of what this action plan will entail. We'll be hearing a presentation from Jan Bear of the City of Glendale about how our Building Energy Codes can improve resiliency. We'll have a panel on the industrial sector and capturing savings from improvements there, a panel on building decarbonization and what opportunities and challenges we can expect to face in that effort, a panel on local government action to achieve more energy efficiency, and a final panel on capturing deeper savings from a multifamily building stock, before we close with other comments and adjourn.

So the way we'd like to operate this workshop, at the end of each presentation and panel there will be an opportunity for folks in the room and on the phone to ask questions. So if you're in the room, if you wouldn't mind going up to the podium there with the microphone, speak into the microphone, so that way it gets recorded for our use and so people on the phone can hear what you have to say. So, yeah, we'll be saving about 15 minutes at the end of each presentation

for that. Then at the end of the day, we will also have a moment for people to make any other comments related to what they heard today or that they'd like to be on the record so that we can take it into account as we develop this action plan.

So that's housekeeping.

So, really, as I mentioned, we're here to learn from all of you. We, up in Sacramento, don't have all the answers. You guys are on the ground, actually implementing the programs, learning from your constituents about what's working and what's not. So we're here to learn about that and take what can be applied and share it through our action plan.

And we have, beyond just what we're covering today, a whole series of questions we're also looking to receive input on. Those are within the workshop notice that went out to notify all of you that this was happening. We would appreciate you to look at those questions and submit written answers into our docket that we can then take into account during the development of the action plan.

We will be keeping the docket open until

May 15th at 5:00 p.m. and that includes written comments about anything you've heard in the panels or the presentations today.

If you are so inclined, there are recordings from prior workshops, so you can go back and listen to those, following the links that are on the slide here. The agendas are posted along with it so you can see, roughly, you know, what topics were covered, who were the speakers, if you want to go and listen to a particular piece and provide written input to that as well.

So with that out of the way, I'd like to call up Commissioner McAllister to give us some more opening comments.

COMMISSIONER MCALLISTER: All right, thank you, Michael.

Let's see, first of all, I want to acknowledge staff at the Energy Commission. There's a huge, you know, significant team, Michael, Heather and the whole team, that have been, I think, peregrines across the state to organize these five workshops. And the first one was a collaborative with the California Public Utilities Commission, so we have been working

closely with our colleagues over there and will continue to do so.

And the second thing I want to just point is that this effort is actually quite unique. We don't always get out of the building to this extent, you know. And as Michael said, we don't have all the answers in our, you know, Soviet-era concrete building in Sacramento. And we have, you know, hundreds of very engaged people with lots of expertise and, you know, a fair amount of idealism, and a mandate to really change the way things are done to reach our climate goals and our energy goals.

But, you know, solutions don't just materialize out of thin air. We need to engage up and down the state, you know, the whole state, and up and down sort of the organizational structure of the state. So local governments are a key factor in all of this. They're the only ones that really touch every project. You know, the contractor communities, all the trade allies, the labor, you know, those are the actors, the consumers, you know, him or herself, you know, the homeowner, the building owner, the multifamily administrator, those are the folks

that need to take action if we're going to reach our goals; right? They're the folks who we need to figure out how to work with and how to support to get the kind of investment in these buildings. You know, the capital markets have to engage, the banks, the financiers, you know, the VC, to develop new solutions.

So I'm trying to put this workshop in context because the energy -- the California Energy Efficiency Action Plan is fairly expansive and it covers -- it will cover a lot of themes. And, you know, we need to integrate; that's kind of the word of our time, is integration. We have a lot of, I think, complementary goals. But, you know, we're facing income inequality. We're going to have a housing crisis. We have a lot of issues that directly relate to our built environment, so energy is not the only one. And so the energy solution has to come in this in some broader context that meets people where they are.

You know, I always say we can develop regulations in Sacramento and tie them up with a nice bow and throw it over the firewall into the world but if the building departments and, you

know, people across the state don't pay attention and don't want to comply, they're not going to comply, and so it has to be in everyone's interest.

And so the themes today really are core. They're vital for progressing in the direction that we need to go. And so, you know, the building decarbonization is sort of the topic of our time right now. We've got a lot of policy being made where that is sort of the umbrella idea. But it overlaps incredibly, just very, very tightly, with what we've always done in energy efficiency. And there's the grid optimization kind of angle, as well, that is more and more important as we have lots of new rules and we need better grid interactivity in our buildings.

And so all of these trends come together and they actually dovetail quite well. And we're counting on practitioners out there in the world to do it right and let others learn from that experience.

Industrial sector, I'm really happy to see Professor Beyene on a panel here. And that's an area where I think the state has, frankly, kind of dropped the ball over the last couple

decades and it's got to come back on the radar. You know, I think it's challenging from a perspective of a state agency or a regulatory because there's really no one-size-fits-all. It's a lot of custom kind of work. So we need to figure out to engage and how to bring some resources to the industrial sector such that those programs can be effective.

Like I said, local government, that's just a critical, critical one. We've done some things at the Energy Commission to provide some resources through the Local Government Challenge and other pathways to support local governments, particularly innovative local governments, in how they deal with their built environment and how they get more savings. But we have a big state. We have hundreds of jurisdictions and they all need to move in the right direction.

And then multifamily, that's an area also that's, I think, undertreated in the state, but it unifies all these issues that I've mentioned before with housing and income inequality and densification, urbanization, you know, infill development. It really is, I think, a political moment to focus on multifamily. And it has the

benefit of being the right thing to do.

So we've been working with the PUC on how to get more resources from the portfolio into the multifamily sector. And I think that's going to move in that direction which is really positive. We have a very collaborative relationship over there with the PUC.

And, you know, integrative design in new construction, as well as deep retrofits of existing multifamily, is something that we have to do, particularly in the low-income sector where we have 35 percent of the state is low income and they rent and live in multifamily buildings in large part. And, you know, in Southern California, L.A. in particular but also San Diego, is really, you know, ground zero for figuring out how to get into multifamily buildings and making it a lot better.

And we have the AB 802 Benchmarking Program that's kicking in for multifamily, so we'll be getting better data as those buildings get benchmarked, and we'll be able to target programs better.

But, again, I'm going into each of these topics because I really want to exhort everyone

to put on their thinking caps and figure out solutions with real actors, with real pathways, with real sort of program structuring, perhaps, but solutions that are going to work in the real world, that have worked in the real world. You know, you all out there listening online and here in the room are the ones with that experience and that perspective.

So, you know, we're not going to reach these, our climate goals, our energy goals, without, you know, having gone into many of the other issues, like transportation, electrification, that are also happening at the moment, but we're not going to reach our goals if we are (indiscernible). We have to work together as teams. We have to work for California.

And people are watching. You know, all over the world, people are watching what California does. And if we can be successful and get to the 100 percent renewables, if we can be successful at getting a stable grid that's optimized and connected to all efficient buildings and relatively low energy bills and relatively carbon free, we are going to get to show the world that it can be done. And I am

very confident that it can be done. There's urgency. We need to do it sooner rather than later. So other states look to us every day, you know, not so much the federal government these days but that will change. And other countries look to California for leadership in these areas.

So, you know, I'm trying to put this workshop in context, that we don't just come down here just because. You know, we don't work on these reports just because. When this action plan gets adopted by the Commission, it becomes state policy. You know, the legislature has asked us to do this.

And so then all of you, if you've got your ideas in that report, you can say, hey, it's policy now, we have to do it. And then you have better sort of backing to go get funding, to go put together a program, to go bid in as a third party to (indiscernible) portfolio.

So once it becomes, you know, black and white and it's adopted, it becomes a real thing. And so we need the best ideas to get into this action plan so that we can execute, and not just us at the Commission, I'm saying the royal we across California. You know, there are lots of

actors. We're going to be talking about building departments and the PUC and the ARB and the CAISO and, you know, contractors, laborers, community colleges, all the trade allies, so, you know, the list goes on and almost (indiscernible). But we're going to be, you know, kind of saying, you know, literally, honestly, what we think needs to be done. And the whole point of this workshop and this interaction with stakeholders is to make sure that it is actually what should be done, not just what we think should be done but it's going to work.

So I've taken more than my five minutes but I really feel passionate about this. You know, it's a great time to be working on energy in California because everybody's watching in some way, but also because we're the fifth largest economy. We have 40 million people. We've got, you know, 14 million buildings overall, something like that. And so the enterprise is a significant one. And we're an innovation economy and we can do this. And California is one of the places where it's, you know, really being done in earnest with some resources at some scale.

And so we all can be a part of that and I'm actually really excited about it and want to do whatever I can to lead this effort and to highlight good stuff that's going on around the state. So I think this action plan is the platform for that at the moment and I think we should all take a vested interest.

So I will pass it back to Michael. But, really, thank you all for coming. And again, thanks to Staff. Thanks for the collaboration with the PUC. And I think they're going to be very helpful with this. So thanks, all the presenters, too, for being here.

So, all right, we'll proceed.

Thanks, Michael.

MR. KENNEY: All right. Thank you, Commissioner.

So we're going to move now into just a brief overview of what this action plan is and what that process was to -- like what's driving our, you know, workshops and what legislation has led us to this point.

So we realize that, while calling this the California Energy Efficiency Action Plan, we're not here to solely focus on energy

efficiency. Building decarbonization is a piece of this. Energy equity issues is a piece of this. So don't just think that we're in a little bubble only dealing with energy efficiency but that is the primary driver for the plan.

So just a little bit of background of where we're coming from with this plan.

So all the way back in 2009, Assembly Bill 758 requested that the Commission develop a strategic roadmap to improve energy efficiency, focusing on existing buildings within residential, commercial and public buildings. And so that was taken in multiple stages.

The most recent, in 2015, with an update in 2016, is the Existing Buildings Energy Efficiency Action Plan. And so that has kind of been our -- well, that's our guiding document for the past several years, but it's limited. It was limited to just a few building sectors and just to existing buildings and really only looking at energy efficiency. Well, a lot has changed since those reports were written.

So then starting in 2015 when Senate Bill 350 was passed which asked the state to do a lot of things, just one of which was to double the

energy efficiency we expected to achieve by 2030, which was quiet an aspirational goal for us to set out and work towards. So we began in the years following to take a deep look at where is energy efficiency coming from, what programs are, you know, driving those savings, and how can we forecast those savings into the future? And where do we need more work to happen? What recommendations do we need to put out there to drive more energy efficiency to actually achieve that goal?

So from that bill, we put out a report in 2017. The Senate Bill 350 Doubling Energy Efficiency by 2030 Report is available on our website should you want to go and review that. And it expanded beyond just that existing buildings to look at agriculture, industry, new construction, issues around conservation voltage reduction, (indiscernible) , and fuel substitution. So it took the scope of our initial sort of reporting and really expanded it.

And so in all our wisdom, we decided, instead of writing these two separate reports going forward, we need to integrate them since they are essentially working towards the same

goal, energy efficiency and, you know, reducing the impacts our buildings have on the world.

So we took those policy drivers. And then more recently with the policy drivers coming from Assembly Bill 3232 last year, which is having us assess reducing greenhouse gas emissions from our buildings, so bringing in this building decarbonization piece, while this action plan isn't going to be the full assessment, it is an opportunity for us to take that into account as we move forward. So that way, as we review and update this action plan, we can keep building decarbonization as a piece from the start.

We've had another sort of one-off studies, folks in the low-income and disadvantaged communities. And those components that deal with energy efficiency are also being taken into account through this integrated action plan. So we'll be seeing what progress has been made, what recommendations need to be addressed, and if there are any new recommendations that we can put forward based on the way the energy efficiency industry is moving.

So all of that is going to be wrapped together. We'll be making new policy

recommendations from what we learn from all of you and, hopefully, coming up with a good set of solutions that get us to our goals in 2030 that work for everybody. They may not be the same solution for everybody across the state but then we want to make sure that we're capturing what folks' needs are.

So again, this report will be in development following, pretty much, after today, our last workshop. So we'll be doing our due diligence to communicate that this report comes together. What we have right now is kind of a basic structure.

So we have several guiding principles that are keeping us in line as we move forward with this plan, so essentially making sure that all the recommendations are market centered. We're not here to just create a bunch of regulations that aren't going to actually spur any change in the way our markets function. We want to make sure that everything that we do maintains reliability, that means, you know, both electricity, higher energy reliability, but that also the programs themselves are reliable.

Any savings that we've putting forward,

so as we're tracking these targets that we've set to achieve this 2030 goal, we want to make sure that those savings are quantifiable , that we're not just arm waving about where we think savings are coming from.

And any recommendations could be scalable, whether they're program recommendations or policy recommendations, that they should scale and work for folks.

And the Commissioner alluded to our policy coordination. So working with local governments, working with our sister agencies, the California Public Utilities Commission and the Air Resources Board, those relationships need to be maintained and to be ongoing as we develop these plans. We don't want to duplicate efforts. We don't want to haul this train in different directions.

And a really important thing, we need to make sure that things are cost effective. And that's going to mean many different things to many different people, especially, as we've heard, throughout this road show, that that has a lot of different meanings. And we're not here to dictate one definition for that but we want to

hear what is working for people and why.

And really something that we've not characterized well in the past is the non-energy benefits or the co-benefits of energy efficiency. Those need to be taken into account and reported on. You know, what are improvements in comfort and indoor air quality and safety that come as a result of the investments we make?

So all of those principles kind of lead into our goals which are, essentially, our policy drivers of reaching our 2030 goal in addressing energy equity issues and reducing the emissions coming from our buildings, so we're really excited about it. We're getting to integrate many different pieces into one plan, expanding our scope. Clean energy and energy efficiency shouldn't exist in a bubble.

So a lot of what we're hearing throughout this road show is, you know, we need to think more broadly about the way we go out into the world and talk to people about energy efficiency. It's not just we're going to come up with a new water heater and somebody else is going to come in a few months and tell you about new heater. There's ways we need to start thinking about how

we approach these issues.

So I'm excited for getting started on this report and looking forward to what we have to learn from you all here today.

And with that, I would like to pass it to our first -- or, actually, I should pause.

Are there any questions first about what I've described or what this plan is? And I you have questions, as I mentioned earlier, please do come up to the podium, and I'd be happy to take those questions.

If there are no questions, then I will move on to our first presentation of the day if I can move that slide. So we have Jan Bear from the City of Glendale, he's a Building Official, and he'll be talking to us about our Building Energy Codes and how they can help us, you know, deal with the many issues we're facing due to climate change.

Just a little bit of context. We had a presentation in Redding to a similar degree from Sonoma County, talking about their Office of Resiliency and Recovery. So they're working up there to help people who have been affected by the wildfires to rebuild and not just rebuild to

the minimum but to incentivize them to go above code and find ways to be more ready for another disaster, should one happen.

So I'd like to turn it over to Jan.

MR. BEAR: Thank you. I'm Jan Bear. I'm the Building Official from the City of Glendale.

Building and safety departments throughout the state have been partners with the Energy Commission since the 1980s. We changed how we thought about codes at that time. Our codes were always what do we know? Is it the best code? Are buildings safe? And then in the '80s when it came in I think the Energy Commission will say they've had a rocky road with building officials and having us trying to enforce their codes, but it's changing. And that fundamental change meant a lot to building departments. We were always just about making buildings safe. At that point they were asking us to not just make them energy efficient but to look to the future. It changed how we looked at codes and what the intent of codes were.

To provide that, you know, it was always difficult for building departments to say, what's more important, will the building stand up after

or a disaster or is it energy efficient? And we had to learn that both were important and we have.

For the past many years the Energy Commission has been developing the codes, promoting what the state's vision of energy efficiency is. We had to adapt and learn but they've trained us. They provide excellent training for all the building departments to understand what energy efficiency means, not just for our local community but for the state and for the world, and they brought us along and we're happy that they did.

All the energy codes, we're used to codes that are developed by national bodies. The State Energy Code and the Green Building Code are developed by California for California. They provide a benefit to us. They provide a benefit to our communities and to our future communities. And we look at that and we say, okay, that's sustainability. The change now, and even in our building codes, is how do we get from sustainability to resilience?

Resilience is the ability of a community to come back after a disaster. He talked about

the disasters up in Northern California. In my city, through its history, we've had every kind of disaster. We're on an earthquake fault. We're on -- we have mountains, mountain ranges running through our city. We have flood channels and floods. So we've had every kind of disaster in the history of Glendale. And all of them come together with how do you rebuild afterwards? How do you get businesses back online? How do you get people back in their houses? And at the same time, what would have been nice if we had it?

The use of resiliency in building departments, we currently look at things like are you going to hope your foundation is bolted? Are you going to provide retrofits for soft story residential, the multifamily residential housing? And the reason is we want people in their houses after a disaster, a major event, an earthquake, a flood, anything. The goal of a community is to come back together, get back to normal, and that's what resiliency is.

In the beginning of the electrical or the Energy Codes, I don't think that there was a lot of resiliency planned in it, but things are changing, technology is changing. The ability to

provide for preparation after a disaster by what the Energy Code has developed is really critical.

We have CERT Teams in the City of Glendale, Civilian Emergency Response Teams, and the Red Cross is part of that. And one of the volunteers there came up with a wonderful simple solution after an earthquake if you use your electrical service. They said buy a few of those landscape, solar landscape sets. You can set it out and you can charge it during the day. You now have lights in your house at night. Simple, brilliant adaption of our new technology.

Well, through the development of the Energy Code, we now have solar panels that are going on roofs. We have battery backups. We can energize individual homes after a disaster, even if they lose their -- they come off the grid. That's something that we could not have before. We should explore it. That's why you want to promote after an earthquake. You don't want to say, oh, let's get people back in their houses and forget energy codes. We want to make sure that we do provide those kinds of elements that will benefit the community, both in a response and in the future.

Cell phones; it used to be that if you lost your telephone line, you couldn't communicate. Now, if you can charge your cell phone, you don't need a permanent line or a hard line. Those are things that technology is changing.

You carry it out with the battery backups in electric vehicles, we now have transportation after a disaster.

All these are things that came about slowly, and maybe unintended, from the state's efforts on its Energy Codes, on the Green Building Codes, and so after a disaster, regardless of what kind, we want to make sure that we start implementing more and more of these policies and practices. Because going forward, that's what the community -- what's going to benefit the communities that we serve.

It was kind of an interesting intellectual thing because we haven't pushed resiliency into our electrical code. Resiliency is basically looking at the existing building stock and saying, you know, those need to be addressed also. So in the future, whether it's through incentives or whether it's through

mandates, to get some of these local and site-specific energy configurations that will provide assistance after the disaster, I don't know where it's going to go.

But the one thing that we have established, and especially through the Energy Commission, through CALBO (phonetic), through the different connections that we have, is that building and safety departments, the local jurisdictions, will be integral partners with the Energy Commission as they go forward.

We look at updating our codes every -- regularly, every three years. The energy -- the building and safety departments do work with what they see to get those standards in the Energy Code and we will continue to do that.

But the main thing that we want to say going forward is that we are partners and we are the local implementer of these policies that the Energy Commission has. And we are trying to be creative to see how we can utilize what they develop, what they learn, and on the local level and get partners to get those things into buildings so that when a disaster happens we are better off for it.

And so like I said, mine was kind of short but it was important that building departments come out and show that we are a partner with the Energy Commission to make sure that our state's vision will go forward.

MR. KENNEY: Thank you, Jan.

So I'd like to open it up then for any questions you may have for Jan. So if you do have questions about his presentation, if you want to come up to the microphone here, so that way we can get you on the WebEx. So if you have a question, come up, please state your name, and I'd be happy to take it.

MR. DOWNS: Hello. My name is Cory Downs with the City of Chula Vista.

A little bit of a tangent, but I was interested if you had any thoughts on the upcoming IECC elections?

We've been reached out through a number of programs looking to or encouraging the City of Chula Vista for vote for the more stringent of the energy efficiency options. In the past, our building official hasn't voted on that because it's not something that we adopt. We adopt our -- you know, the California Energy Code.

So I was just wondering if you had any thoughts on that or if you were planning on voting one way or another for this?

MR. BEAR: We focus our energy on the state standards, also, and so we know that those standards probably won't become part of our regulations. And so in core efficiencies, we partner with the Energy Commission.

MR. DOWNS: Although, it connects a quick -- and I think the Energy Commission is planning on voting in these elections for the first time; is that true, do we know?

MR. KENNEY: I'm not sure but --

MR. DOWNS: Okay.

MR. KENNEY: -- our Commissioner is nodding his head, yes. That is right.

MR. DOWNS: Okay. Perfect. Thank you.

MR. HANACEK: Hello. John Hanecek with a company called Can Cover It.

But I was curious, kind of more, probably, about electrification, if that's the word, in relation to resilience because you kind of mentioned electric cars but we've had gas generators all over the road for, you know, what, 100 years now.

So I'm curious, like when you're thinking resiliency and electrification, are you trying to make the resiliency carbon-neutral, as well, or are you willing to fire up a diesel generator, you know, when things go wrong?

MR. BEAR: When we're looking at resiliency for communities, it's how fast can get the community back up? At that time, you're really not looking at -- you look at what's available. Time is of the essence. You need to have roads open. You need to have transportation. You need to bring in food. You need to get utilities back online.

The resiliency what we look at for using solar panels or using these other options is for most communities, when they talk about disaster preparation, they're talking about, hey, for three weeks assume you're going to be on your own. And what can you do to stay in your house, to stay safe in that three-week period?

I went through a disaster, the Northridge Earthquake, out in the City of Santa Clarita. They did anything they can. They called Budweiser over in the San Fernando Valley and they delivered bottles of water. They didn't

care where it came from as long as they got the results. If they were going to use gas -- I don't think anyone's going to be looking after a big disaster what their carbon footprint is. They're going to go, hey, did we not lose anybody after the disaster?

MR. HANACEK: Yeah. Just one last thing is like are you kind of seeing resiliency? Now it seems like you're planning for if/when a disaster happens, it's actually an opportunity to retrofit things to make them better, rather than just return to the norm but rather, you know, go to another -- a future, a better future?

MR. BEAR: Disasters tend to clear out communities if they're large ones. And the rebuilding efforts is an opportunity at that point. We will -- you know, that's when you start implementing. It's not like, hey, you need to go spend extra money to have the same size house. No. You're going to build a new house and it's going to be really efficient.

And so when disasters happen, the first thing we look at is that's not the time to cut the code requirements, it's the time to enforce them.

MR. HANACEK: All right. Thank you.

MS. HAWES: Hi. Good morning. Lindsey Hawes with the Center for Sustainable Energy.

Thank you for your comments this morning. It's nice to hear your enthusiasm around the Energy Code and, I will say, a little refreshing to hear a building official really see the value in our Energy Code and its applicability towards resiliency in our future state goals around energy.

I have a two-part question.

Curious; I've been hearing about this so-called, in quotation marks with my fingers here for the folks on the phone, the silver wave or the gray wave of building department staff, essentially, that we're losing staff folks to retirement and we're not seeing, you know, a big wave of incoming new staffers to building departments to do this really, really important work of implementing, you know, what our state and nation is setting in terms of minimum standards. What are your thoughts around that? And, you know, how does that trend potential play into future implementation of our Energy Code and other codes?

And then, I think, related, what are your thoughts around technology and how technology can potentially improve or change the way we are enforcing codes in California and elsewhere?

MR. BEAR: Well, the first one, yes, the silver wave is real. It's devastating to us. In my department, 60 percent of the staff is within five years of retirement, a lot of institutional knowledge. We're actually working to reach out to veterans' groups in our city, high schools, junior colleges. We're trying ride-alongs for just community members that are interested in it. We reach out to the trades themselves to see if any of the people that are currently working in the trade are going to come onboard. We're reaching out to the universities for the engineering-level students for our plan review. We're trying to do anything we can do get people interested in the profession.

One of the reasons I'm here today is to show that building departments are a viable part of the state's plans. It's also Building and Safety Month, so I can get a plug in for that, thank you.

And, no, it is real and we're working on

it hard. The 2008 recession just really caused, you know, a big chunk of problems for us.

And the second one, technology. Technology is changing the way we deliver service: the way we review plans. We're trying to, you know, transition from paper to digital medium for all plan reviews and submittals. It will help because we'll reduce traffic flow to the city because we can do things online.

One of the big pushes, industry pushes for that, is actually the solar industry. They love doing things online, as opposed to coming down and waiting, so we are seeing where technology is going to use that, the same thing with drones and things like that, to assess damage after a disaster, or even little things like it's a lot safer to send a drone up to look at a roof than it is to climb a ladder.

So we're trying to implement technology wherever we can.

MS. HAWES: Thank you.

MR. KENNEY: Okay. Any other questions?

Well, thank you, Jan, and --

MR. BEAR: Thank you for inviting me.

MR. KENNEY: Yeah. So a round for Jan

Bear.

(Applause.)

MR. KENNEY: Okay, so we'll now be moving forward to our first panel of the day about capturing energy efficiency from the industrial sector.

Michael Lozano from the California Energy Commission will be our moderator. And I'll hand it over to him to do introductions.

MR. LOZANO: Good morning. I'd like to call up my panel.

My name is Michael Lozano. I'm --

MR. KENNEY: Is the mike on?

MR. LOZANO: Is the mike on?

MR. KENNEY: Yeah, there you go.

MR. LOZANO: Good morning once again. My name is Michael Lozano. I'm a Senior Mechanical Engineer with the California Energy Commission, specifically working in the Industrial Ag Water Team doing research in a variety of different areas.

Please, my panelists, could you come up and take these seats right next to me?

I'd like to introduce my panel at this time. We have quite an impressive group.

First of all, we have John Zwick. He's a Senior Account Executive with San Diego Gas and Electric Business Services where he has spent the past seven years assisting industrial customers with the development and implementation of their energy efficiency plans. Prior to SDG&E, Mr. Zwick served in several operational and technical leadership rules in industry, and the U.S. Navy, including as a Chief Engineering Officer for a nuclear submarine. He holds a B.S. in Eco Engineering from MIT and an M.A. in Management from the University of Redlands.

Pam Birkel is a Senior Strategic Energy Management Coach for Cascade Energy. She has been a key player in developing SEM programs for utilities across the country, most notably Energy Trust of Oregon and SDG&E. And she is currently leading cohorts from industrial customers for SDG&E, City of Phoenix, and B.C. Hydro. She as an architect prior to this and she holds degrees from Princeton, UCLA, and University of Oregon.

And finally, coming up right now, Dr. Asfew Beyene. He's a Professor of Mechanical Engineering at San Diego State University, PhD from Warsaw University of Technology, and

Director of DOE's Industrial Assessment Center at San Diego State. The Center has audited about 600 manufacturing plants since 1991, so he knows a lot about a lot. His research integrates computational and experimental techniques to address fundamental and practical problems of energy conversion. He's a Fellow Member of the American Society of Mechanical Engineers.

All right, since I am an engineer and I'm asking the questions, I'm going to jump right in to the first question of the day. We're going to go from left to right.

And the question is, John, first up, what emerging energy efficiency technologies do you see on the horizon that may help the industrial sector, specifically the California industrial sector?

MR. ZWICK: I think the biggest opportunity that I see in the area of technology is in the area of controls. There are really -- in many manufacturing plants there's not the equivalent of a building management system that's available for the manufacturing plants to maintain an awareness of what their energy consumption is.

With -- you know, in SDG&E's Energy Efficiency Industrial Buildings Plan, we've identified that the opportunities for energy savings might be twice as large for operations and maintenance areas than new equipment upgrades. And so I think the key to that is really being aware of where the energy is being used and, you know, where the opportunities are to reduce energy.

And some things that I think are important are to actually understand the -- like I would say normalize the energy in a way that allows you to see the amount of energy used per unit produced. That translates to financial metrics that the cost accountants and the finance people will understand.

Also, I think there's opportunities to take advantage of, and I'll use the word technology a little loosely, there's a lot of effort out there in the manufacturing sector to be better manufacturers through Lean Sigma, process improvement, and leveraging a lot of those process important technologies to help and improve the energy consumption, I think, would be a valuable resource.

MR. LOZANO: Pam, same question.

MS. BIRKEL: One thing we find with industrial customers is that they tend to be very risk adverse, so risk technologies can be a little scary. We tend to see most industrials wanting to wait until the technology is proven and they can prove a quick payback for that technology.

We do find in San Diego that customers are a little more out there and a little more willing to take risks, so that's refreshing.

One thing, our program, our Strategic Energy Management, or SEM, Program offers is --

COURT REPORTER: Is your microphone on?

MS. BIRKEL: Is it on? How about now? Sounds right. Thanks.

Yeah, so our Strategic Energy Management Program offers savings through working with groups of industrial customers over a period of a year or two years to identify low-cost and no-cost things that they can do to change and we see great savings from that. So that's not a technology but it is a new trend in industrial energy efficiency.

We're also seeing, just strictly on the

technology side, we're seeing, John mentioned, controls and we're seeing a lot of that too. And controls for all systems are becoming much more advanced and that's exciting.

We're seeing changes of equipment from pneumatic to electric and that's an energy saver in general. We're seeing a lot of air compressors now having systems where they can reuse waste heat from those and use that for pre-heating systems.

So we are seeing a lot of things out there that are getting proven. We're seeing, interestingly, in laboratory buildings we're seeing a system called Aircuity that can ramp up air changes only when necessary. So in lab buildings the HVAC and air changes is a huge energy user, so the system, Aircuity, allows air changes to be low unless there's a need for high. If there's a spill or something like that, it will ramp it up, so the default is a low level.

So those are some of the specifics we're seeing.

MR. LOZANO: Thank you.

Dr. Beyene?

DR. BEYENE: I think -- am I there? I

think solar is going to drive a lot of, not only in and of itself as a new technology, but it's going to drive a lot of new concepts in technologies in energy saving, primarily in energy storage, not only solar. Because of the nature and intermit nature of these resources, both solar and wind, I think energy storage is going to be big. And over the last ten years, we started getting questions by plant managers, how about solar? In the old days, we mentioned solar and not yet, I'm afraid of that. Now they are interested in solar. Even if we don't think -- if we pay back for them, but they still want to see a report, and so I can show it to their boss.

So, and I agree, there is a significant lag in time between new technology and the time manufacturing plants adopt it with confidence. For example, solar itself as a plant, as an energy conversion plant, is much older than the adoption or the implementation of manufacturing plants, and yet there are such roofs and they could adopt solar.

So I think one is solar but that will couple a lot of other new technologies, including storage.

The second one I think will be variable frequency drives and, again, other electronics in the area of controls. One of the biggest problems in industry is the mismatch of the energy used in the lodge. You have constant supply of power to the compressor but they may need compressed air equivalent of 50 horsepower in the morning and then 100 in the afternoon, and then in the evening it may drop down or they may shut it off, or just one station. And for all these loads, variable loads, you only have 100 horsepower compressor and that mismatch has been a big problem over the years. So variably frequency drive, not only in compressors, but it's really all over industry and I think that's going to make a big difference too.

MR. LOZANO: Thank you.

You know, this is the first time I've met my panel and I find it fascinating that a lot of our thinking is along the same area. We're finishing up a project on controls in 102 sites for compressed air and we find the exact same problems. We have to make it simple. And we send them a text on, okay, you can fix this or you can delay this maintenance on a certain

compressor but it seems to be going out of ramp from your baseline, which they never knew about.

And also, bringing up Pam's observation, one of the problems that we've seen getting new technologies into market, of course, is what you have is the person paying the electricity bill is not the shop floor manager. They think, oh, it's $100,000 a month electricity bill, this must be right, you know, and then they just sign the check and they send it on. And the shop floor manager, all they care about is making their widget. So if you try something new and it doesn't work, well, he's in trouble. But if it does work, there really isn't an incentive program for him.

So I find it fascinating that it's like every one of my panel mentioned something that has been a standard thought of people I've met.

So based on that, moving on to question to, I'll start with Pam on this one.

What outreach and education help to achieve more energy efficiency from the industrial sector? Would you consider, basically, we have our problem of how do you convince a mid-level industrial operation that

doesn't have a dedicated energy efficiency person, which is most of them, how do get them to adopt these technologies? If it was just based on a program of outreach and education, how would you do it? And what do you think would be the best way that the state could help?

MS. BIRKEL: It's an interesting question. The program that I work in, Strategic Energy Management, is really, at its core, it's an education program. And these programs are offered through utilities, typically. We do them sometimes directly with customers. And the education is a very hard part of that conversation because how do you let people know that we can help them achieve, you know, ten percent energy savings through this program? People, even in utilities, often don't believe that the savings could really be so great as we're able to get. You know, five percent is typical. We often see it much higher than that.

But the education is a challenge. And I think that ties, also, into what you were saying about people on the plant floor don't necessarily know. It's not transparent, what their energy use is. And often we find people on the plant

floor who have a very green mindset. They really want to do things but they don't know how to get that. And it's hard for them to generate the momentum within their company for how to do that.

So our program is education. But bigger than that, the problem of how to get it out to people is a real challenge. I think there's ways through utilities but I think the CEC, actually, could help with other ways of doing that as well.

MR. LOZANO: All right, John, same question.

MR. ZWICK: So I think, you know, when it comes to outreach and education, I think it is very important and it can be very successful.

I'll give an example, a case study maybe, and that is the Department of Energy Compressed Air Challenge. So that's a very, well, it's an outstanding training program that's been put together by the Department of Energy. It's taught be recognized experts in the compressed air field, I mean, the best of the best. And it's a very well-designed curriculum that helps people come and actually develop a plan for their facility.

And so that specialized expertise, that

hands-on, that very practical output that can yield some quick wins in ROI, I think, is very useful.

We've had companies that have attended that training and they've gone back and they've redesigned their air systems as a result of it, and in the right way.

So I think, you know, that model is very -- can be very successful. There's other technologies, such as vacuum systems, dust collection, pumping systems, perhaps heat treatment, all of these energy-intensive technologies that are out there, if we could get that type of specialized expertise and a similar type of training program as the Compressed Air Challenge, I think that would be helpful.

Another thing I think that people could use help with is the integration, in a sense, of how do I take all of these resources, all of these technologies, all these programs, but I have to understand how it applies to my facility?

And in the case of an industrial site, it's very -- every site is unique and so every site needs a different answer. And I think having resources that can help to answer those

questions for a site, what's the right portfolio of resources for me, I think that would be helpful, too, sort of technology assistance in that area as well.

MR. LOZANO: Dr. Beyene?

DR. BEYENE: I think I have the homecourt advantage on this because I've been doing this for 28 years. In other words, we don't have to reinvent the wheel.

Manufacturing is a little bit different beast. You can't call them and ask them, I want you to come and I want to educate you on something, they don't have time. Even when we go, one of the policies, part of the grant contractual agreement is that we spend only one day at the plant. So I have to take another colleague and maybe five to six students so that we only spend one day. And I don't allow anybody to call the plant manager; one person calls. And then we don't call them two or three times, if at all we call, because by now we are so experienced that we get all what we need to do in one day. But if we have to call, it goes to one person. In other words, you have to be less intrusive.

And then data have to be -- has to be

confidential. In the case of IAC, the report goes to the plant. DOE gets the report because we need to be audited, but without name, without address. We have to give them the confidence that you are not intruding and the data is -- that you keep that confidential.

There are multiple things that we have done and that's why we survived. It's a federally-funded program. We survived 28 years. You don't find such a program funded by the federal government every four years. Once, they gave us five years. In other words, we survived through the budget cuts, even the most recent budget turbulence, we survived that. It's not common.

So we don't have to reinvent the wheel. We can do -- take that model which has been useful and practiced for almost 30 years in the case of San Diego State, but there are centers that are older than us. We keep it simple. We don't write a professional-sounding article. We write a simple report that the plant manager can understand. And it has to be simple, meaning you have to have the savings, the implementation costs, the payback period, in a manner the plant

manager will understand it.

So if we drew these -- in other words, for us to take a little more than education and give them some incentives for some of the established ideas, I think the model exists and that can be adopted and it can be very, very useful. But it has to target small and medium plants because the big ones, they should have their own in-house plant energy manager. And that's what we are doing also, small and medium sized, because they don't have their own expertise. It's too expensive to hire a full-time engineer.

Did I talk too long?

MR. LOZANO: No. No. Actually, that's perfect.

Follow-up question for Pam, just a follow-up question, I've found one of the biggest problems for doing research in my area, industrial energy efficiency, is finding the site. So what would you term to be -- how do you find that person that's willing to adopt? Because I've found it isn't like you would think Silicon Valley, there's going to be a lot of people that are just, you know, progressive at

thinking they're going to try something new. And the truth is it doesn't matter where you are. I mean, I've been in South Central at a smelting operation, and those two bros, they just wanted to try new things.

MS. BIRKEL: Yeah.

MR. LOZANO: It's all over the board. It's a certain mindset that goes into it.

So how do I get more people ready to try something new, if I was to do one thing in my program?

MS. BIRKEL: I think I might give you a few things, but one thing that has worked really well for us is we've got a big track record now. We've got data. We can say how much you can save.

Another thing that's helped us a ton in San Diego is the help of our account managers, such as John here, for SDG&E. And John knew these customers well and so, as the other account managers did, and so he had an idea of who was going to be, you know, willing to kind of accept a new way of thinking and who was ready for this and who wasn't, and that was hugely helpful.

But we also get leads through various

trade organizations, League of Food -- California League of Food Processors and others like that, we get leads through them. And often, if we get one influencer, I forget the word but somebody that's willing to step up at a trade organization who's had experience with the program to speak up, you know, they want to listen to people in their industry more than they want to listen to somebody that they don't know who's offering them something. They have lots of people offering them things all the time.

But if you can get a trade -- a person in the industry to speak up for you, that is extremely helpful.

MR. LOZANO: John, would you say that to get past those early adopters that just like trying new things, to get that next level of person, do you think it's more of a cost proposition? Is it regulation that motivates them mostly? What do you think is that motivation?

MR. ZWICK: I think it's really -- I mean, there's obviously different approaches; right? But I think it's really important to translate the project into the benefits for the

customer. Some of the benefits are cost. Some of the benefits are regulatory. Some of the benefits could be, you know, innovation; I want to be seen as an innovator. Translating those into the benefits for that company and really understanding that company, I think, is very important.

I think one of the advantages that we have, you know, as the utility is that we -- you know, the customers have to do business with the utility. We're the only show in town, in many cases, for electricity. And so we do have longstanding relationships with the customers and so we get to know their business, we get to know the people, and so we -- and some of these things are timing; right? The timing for a project now may not be good but the timing in six months might be okay. And, you know, we can help by understanding kind of where they are in their business and when those opportunities are right and match up the customers with the projects.

MR. LOZANO: All right, this dovetails into my third main question.

Knowing what you all know about California's utilities, do you think your local

utilities support industrial customers in achieving their energy efficiency goals in the most efficient way? If you were to do something white page, something different, what would you do?

And I'll go with Dr. Beyene first.

DR. BEYENE: That's tough because -- John should answer that because he works with the utility. He probably is more familiar than me.

The Industrial Assessment Center works with manufacturing plants strictly. We don't audit banks or schools or hotels. And you may be surprised but San Diego doesn't have high energy-intensive manufacturing that would sustain us for 28 years. We may still get a plant here or there, whatever, one or two a year, but we do 20 a year. Most of those plants are north in the Edison and LADWP territory, so those are really 80, 90 percent of our trips. (indiscernible). And we have worked very well with LADWP, to a lesser degree with Edison, I think mainly because of the way that it's structured, the gas and the power side.

So are they directly -- in other words, they have helped us, for example, identify a

qualifying plant. One of our problems is getting our leg in. Once we are in the plant, they are very excited, they are very -- they want to have the audit. But to convince them that this is really free, we are not there to sell anything, it's very difficult, and the utilities have helped us.

So just because of the nature of our outreach, we have dealt with -- more with the out-of-town utilities and, to a varying degree, they have been helpful to us. And we are also aware, by the way, they do, at least some of them have, and SDG&E has concluded, correct me if I'm wrong, they do offer some service, but primarily in the lighting and HVAC areas.

Ours is much more complex. We do into the manufacturing process. We try to understand, if it's an injection molding, what is the cycle? What is the -- what are they cooling? What is the temperature required? Why do they need a chiller pump if they use just a cooling tower to chill it?

So we go into the process and -- but I know many of my students who have graduated from IAC over 28 years, more than 120 of them just for

the Center, many of them are employed by SDG&E, they go a little bit further than the traditional lighting and HVAC type.

So, yes, I think utilities are constrained by many other things. But from what I see, they could do more. But I have very little relationship other than industrial assessment with the local utilities simply because of, again, we have high tech but not high-energy intensive in San Diego.

MR. LOZANO: John, would you like to chime in on this one?

MR. ZWICK: So, I mean, the industrial represents about eight percent of the electric consumption in the territory and about five percent of the gas consumption. So San Diego is a relatively small presence from an industrial perspective. But it also only represents about two percent of the electric savings and four percent of the gas savings. So, definitely, there's opportunities to enhance the savings that comes from the industrial sector.

I would say that the programs that SDG&E has implemented in the past, and we're obviously trying to improve upon that, have obviously

focused on the bigger piece of the pie which is the commercial and residential sectors. And I think there's some things that we can do to make better progress in the industrial area.

And I think it comes down to, number one, what I'll call technical assistance. The type of technical assistance and the level of technical assistance to support industrial customers is much higher than commercial, residential and other sectors. And it costs more. So I think we have to recognize that it's going to be more expensive to find industrial savings. However, I think the return on investment can also be there.

The same, I think, goes with incentives. It can be more expensive to implement industrial projects because of the custom nature. And so I think it's possible that the incentives might need to reflect that as well.

Another area that I think is important is to have the right technical expertise. When going into an industrial manufacturer, I've had a lot more success when I've been with somebody who understands that industry. You know, if you go to visit an asphalt plant and somebody knows asphalt and they're coming in as part of the

audit team, you have instant credibility with the customer and they're more engaged and the audit goes a lot better and you have a much better chance of turning that into an energy savings project.

The second thing I would say that's, I think, an interesting idea is to view energy efficiency as part of business improvement. It's very possible that any type of improvement in the manufacturing process will lead to energy savings. And so perhaps sometimes, you know, talking to an industrial customer about the energy efficiency of this particular piece of equipment, we may not get the adoption or the interest as if we're saying let's take a look at your process, let's look at your scrap rates, let's look at your productivity and, oh, by the way, here's your energy savings as well. All those, if you look at it more holistically, I think you might be able to get more interest and more adoption with certain industrial customers.

MR. LOZANO: Yeah. I would say that, you know, CEC's research relationship with the utilities is one of our most important. They know their customers the best. And, as was

mentioned before, one of the most valuable things is the introduction because, you know, they don't me, they don't know our team.

All right, I'm going to move on to the final question. And this one, I want to give plenty of time. It's going to be for Pam first.

Knowing what you know about what the Energy Commission does, can the Energy Commission support the industrial sector in addressing the barriers that have been mentioned and facing energy efficiency needs of our industries? Also, whether other government agencies may be able to help address these challenges? More specifically, you know, you know what we do. And I you were to say one thing, do more of that, that would be a good idea, what would it be?

MS. BIRKEL: That was a lot of -- there were a lot of questions in there, and I'm going to answer the last one first because that's the one I remember the most.

And the CEC is doing some interesting things right now with strategic energy management. We're working through a CEC grant for a corporate direct customer in Ventura County right now. And one of the things that, I'm

trying to phrase this in a good way, one of the things that I think the CEC can be very useful in doing is supplementing programs. For example, if like an FPIP or EPIC grant, some of those things are much easier to do with grants and alternative types of funding than going through a utility that's heavily regulated, so an obstacle.

You know, regulation is a good thing and it has a very good purpose. But one thing we do find is customers leaving projects on the table because they won't be approved for an incentive or because the incentive process will last too long for them.

So I think one thing that the CEC could think about doing is trying to take on some similar programs and see how those might work and kind of weigh the relative cost effectiveness of running programs with a slightly different regulatory structure, if that's possible.

MR. LOZANO: Yeah. And to make clear for the audience, FPIP, Food Production Investment Plan, basically, you have cap and trade money going to this program where we're actually helping the big facilities that are subject to cap and trade. So it's actually turned out to be

quite popular and one of the reasons why it's such a well thought-out program, new program at least, is we have a lot of interaction with industry in coming up with all the ideas.

So interacting with the industry is very important because, that's one thing that you should know about CEC's research program, you know, it's not always about the best technology. It's the best technology that will be adopted.

So going on to John, let me ask the second part of this question. Then, you know, you have the Energy Commission. We're doing our work. What other government agencies do you think, you know, would be able to work with the Energy Commission to supercharge our efforts in California as far as getting energy efficiency implemented?

MR. ZWICK: Well, certainly, you have the CPUC. You have Air Resources Board and the air districts that have certain programs. You know, I'm aware of some programs that come from the Department of Energy, such as industry assessment centers.

You know, I think that when -- as an industrial customer or an industrial site, it's

almost a little bit overwhelming, all the different initiatives and programs that are out there. And, you know, for sites that don't have that energy manager that can keep track of all of the different programs and follow all of the, you know, applications and everything, I think it becomes very challenging for them to kind of take advantage of a lot of these opportunities.

So I think there's something to be said about having somebody that can be a clearing house or a broker and, you know, come and help customers put together sort of the package that's necessary to make it a viable project.

I think there's another -- another area that I think is -- I do believe this idea of specialized industry expertise. I don't think that that's something that can be done, necessarily, very well locally because, obviously, the resources might be somewhat limited, maybe even at the state level. Maybe it needs to be nationally. But having that network of industry experts that can be available or on-call to come in for that particular site, I think, would be an interesting sort of Rolodex to have.

So, you know, preparing that and having that Rolodex, I call it the Mission Impossible Team. You want to have the right team for the right mission when it comes to putting a site together and having that network or industry experts that can come in, the been-there-done-that expert to actually, you know, address a specific site, I think, would be helpful.

MR. LOZANO: Thank you.

All right, I'll give Dr. Beyene the last word.

What can the Energy Commission do to support the industrial sector in addressing the barriers of energy efficiency?

DR. BEYENE: If I were the Energy Commission, I will wage war against wasted heat, especially with the breakers (phonetic) exceeding 500. I don't understand that. I never understood. You burn fuel. You do whatever you do. You have an exhaust heat of 700 degrees Fahrenheit. That's money throwing to the air.

By the way, exhaust heat temperature is the simplest indicator of the efficiency of that system. That high temperature going out, that means I'm not using the heat that you just

created, it is prevalent. It's everywhere. Boilers. Incinerators go up to 1,400, by the way. Industrial (indiscernible) incinerators, they call them oxidizers, but (indiscernible), very high temperatures. Boilers. Curing ovens. It's all over. And it's not that expensive to recover that heat and at least use it to preheat the air that is coming into the oven in the HVAC. And that's (indiscernible).

So wage war against wasted heat.

And then, also, reward and recognize success. I think we should take our hats off for the lighting industry. In 20 years, they never stopped embracing. Their efficiency has continuously gone up. Now you can touch the bulbs. You know, you turn on the build, you can't touch it in the old days where most of the bulb is converted to heat. Now you can touch the bulb, even if they're on, in some cases. Don't try it because I don't, you know, I don't want to be liable.

And I mentioned that we have audited 600 plants, about 600, so we have some data. And our average saving is 20 percent. I don't want to make this science, and extra apologize to Lynn

Tyaconchi (phonetic), but why not? Simply stated, I think 20 percent savings from IAC-type audit is possible, easily. That's linear. We can reduce 20 percent of CO2, 20 percent of increased efficiency meaning increased revenue. So that's quite low hanging but then there are many other areas where -- not only with heat but that we mentioned earlier, I have a whole list.

So what can CEC do?

Again, one of the areas, at least, industry has a problem, from my point of view, is implementation. We give them ideas, reports. We tell them, you know, use VFD on these ten stations of nozzles or dust collectors. They have 20 stations connected to 100 horsepower. But half of the machine never runs. So they can have (indiscernible) sensor and connect to a VFD and the 100 horsepower will run like the old 40 horsepower when it doesn't suck the dust from every machine because half of the machine is not operating.

Now that's the idea we throw at them but they don't know where to conduct, what to do, and there is no -- we are not funded. We are not equipped to do the follow-up. That type of

follow-up, I think, if the Commissioner can do or the Commission can do would be great.

Incentives, of course, for energy efficiency.

And at least the big plants to have their own experts, small and medium, but we like the high and medium because if the utility -- if the plant is paying less than $200K, I don't know if I should carry all my bags and spend the whole day because ultimately I will end up finding $5,000 or $10,000 savings and the DOE is not that impressed because it's going to cost -- we are going to cost more than what we are saving.

So the real small manufacturing is still at a great disadvantage because everybody looks at the payback. And I think that's where there is a vacuum mow. The Energy Commission can step in and say we don't care how much you save but go ahead and save because the cumulative addition of those small, small savings is going to be bigger at the state level or at the national level.

I think I talked to much.

MR. LOZANO: Oh, no, we had time.

All right, I'm going to open it up for questions now. Do we have any questions online?

If not, then you're all welcome to come up to the podium.

MS. SPERTUS: Hello. Can you -- you can hear me? Okay.

My name is Nadine Spertus. I'm an Engineer with Solar Turbines, one of our industries here.

I think, John, you're our account manager, actually.

I'm also on the Board of Directors for the Industrial Environmental Association. And I don't personally sit on the Chamber of Commerce but my supervisor is the head of the Enercom Environmental Committee.

And so, first, I just had a couple of general points I wanted to put on the record, so I just was going to read those for you.

The CEC should keep an open mind about how to achieve building decarbonization goals, that focusing on electrification only is extremely limiting. When you limit your options you limit the future. Electrification is costly, disruptive, will stifle innovation, and negatively impact consumers and businesses. A more inclusive approach that leverages multiple

energy resources would avoid these problems. And Californians are better served by balanced decarbonization policies that rely not only electricity but also on renewable and natural gas, hydrogen, natural gas, and fuel cells.

And I should probably stop here and say that if you're not familiar with Solar Turbines, we have nothing to do with the solar of the sun but we are a gas turbine manufacturer.

And, Dr. Beyene, I agree with you on exothermic reactions and heat going out there. But, you know, when we consider reusing heat and stuff like that, it's very expensive, and we also could affect your air permitting and stuff in the state. So it's not so easy, that you can just go and do all these things. The State of California does not really make that very simple to do.

From a business perspective, some points to consider. Many businesses currently rely on high efficiency natural gas equipment to cost effectively run their operations. And they've invested in equipment to comply with stringent air quality and emissions regulations. Electrification would force businesses to replace their gas equipment with electric equipment at a

substantial expense. Some businesses, like restaurants which operate on narrow profit margins, will simply be unable to do so. Other businesses, like those that require natural gas for thermal processes, could be forced out of the state.

I can tell you, solar, I mean, most of our gas used is all to operate and test our turbines. Only maybe four percent is used for heating of our buildings and things like that.

As you consider implementing decarbonization policies, please keep in mind that sustainability is not just about the environment, it's also about sustainability of jobs, sustainability of communities, and sustainability of the economy.

Rather than mandating a narrow pathway to decarbonization, I urge you to take a more balanced approach that allows for multiple technologies and multiple fuels to compete.

So, thank you.

MR. LOZANO: Thank you.

MS. BIRKEL: Yes.

MR. BEAR: Jan Bear with the City of Glendale Building Safety Department.

How many of your clients use disaster recovery when making decisions? And if they do, would that change the outcomes?

DR. BEYENE: Right away or --

MR. LOZANO: Well, I think John would probably be the first on that one, but --

MR. ZWICK: I'm not sure that I'm the best person to answer that question for you but there are a number of clients. I mean, it is expensive. If you're talking about disaster recovery, you're talking about power loss.

MR. BEAR: Yeah.

MR. ZWICK: So, I mean, there is -- obviously, certain customers are very focused on power reliability and they have, you know, dual service, sometimes they have onsite generation. But I think it's a financial -- it's expensive to do that. And I think they do it because strategically it's very important to them, many customers.

I mean, I wouldn't say that -- I'm not sure I really understand what the -- the answer that you're looking for. But I can say a lot of customers do have backup generators and they do plan their facilities, you know, with that in

mind. But in most cases those backup generators can only serve the emergency load. They really can't keep the building operational just because the size of the generator would be prohibitive.

MR. LOZANO: Just to put in my two cents about, you know, I talk to people, you know, at the sites and whether or not they -- what the reasoning for trying a new project. And almost universally it's payback, first of all, that's king, you know? And they'll talk about things such as, you know, sometimes that it's just good press if you're going green, whatever green means in their particular case. And you'll actually have some stuff about grid stability in certain projects.

But I think that it's more of an ancillary thing that they think of. I don't think they will change, unless it's really specific or they've been affected by a disaster, because we've done a lot of work with flow batteries. And what I'm hearing most when I'm talking to, you know, like a big supermarket or wherever that are putting in battery backups, solar battery backups, you know, they're thinking more along the lines of either the good press or

price arbitrage or long-term savings, that's what they're looking at. And some people are forward enough to think about, well, maybe, you know, we might be subject to emissions credits somewhere down the line.

MR. ZWICK: I mean, we have put some storage in place, the backup emergency centers, you know, with black start capability to be able to start the systems back up.

MR. DOWNS: Hello. Cory with the City of Chula Vista.

One of the questions that we have as a city is tracking energy consumption of our community. One of the things that we've recently encountered is some challenges with the commercial and industrial sector, but I think more so in the industrial sector, and losing some visibility into those sectors in our greenhouse gas inventories because of confidentiality related to the energy consumption at the city facilities. And, you know, it's a question that kind of depends on the size of the city and the number of industrial users and how much they're using.

But I'm wondering if you've seen any

innovative solutions, or maybe through benchmarking, if there's ways where cities can still see, you know, anonymous information about the energy consumption in their community but, also, you know, still maintain the privacy or any of the other concerns that those industrial users might have?

MR. LOZANO: Well, I have no idea about what cities do as far as doing their own energy audits. I don't even know if they have a lot of that information. The utilities have a lot of information about the power that, you know, their customers use, industrial customers.

And as I mentioned before, one of the big things that we're doing now is sensors and controls because you would be surprised how little your moderately-sized industrial facility is aware of their own power use. You know, it's just a bill. Sometimes he's just got, you know, one meter, you know, it's not even sub metered. So, I mean, it's a big problem.

We find it a big opportunity because, like you're saying, we're doing big data and sensors and big data so they can be more in control of their own energy use, because a lot of

the times they don't even know that they're inefficient, especially with compressed air. Because, as you know, a computer, when it breaks, it's broke. You know, you've got a leaky compressed air system, it's still working.

So I don't know what cities will do to know what their power situation would do. That's not my area of expertise. But I would find it surprising if they knew a lot because their own customers do not know a lot in many cases.

MR. DOWNS: Yeah. And this is information that we're requesting from the utility, so it's how are the utilities reporting industrial --

MR. ZWICK: Right.

MR. DOWNS: -- usage to us?

MR. ZWICK: So the utility has, obviously, has obligations to maintain customer privacy. And there's pretty strict regulations about what we can share and what we can't share. When data gets sufficiently aggregated, then, you know, it can be reported to the public. And sometimes maybe you don't get the granularity within, that you're looking for, within that aggregation. It sounds like that's kind of the

situation that you might be facing right now.

MR. DOWNS: Yeah. What we had to do was just combine our commercial and industrial sectors, so --

MR. ZWICK: Right.

MR. DOWNS: -- you know, not the end of our -- you know, it's not going to destroy our inventory or anything but it definitely is a step in the wrong direction for us.

MR. ZWICK: What -- have you thought about reach? I mean, one thing is that customers can voluntarily share that data with you. And so, you know, one approach might be to reach out to those key industrial sites in the City of Chula Vista and develop some type of an agreement or a partnership with them to track that energy usage and then report it to you. So that might be one way to get around the rules that the utilities have to follow.

MS. BIRKEL: I've done that in our program, as well, but the utilities can't share energy information for their customers with us. But customers are usually nowhere near as concerned about the security of the data as the utility is.

MR. DOWNS: Okay. That's good to know. Thank you.

MR. AHMADI: Hi. Good morning. This is Magini Ahamdi. I work for CanTech Energy. I've been doing a certain energy efficiency audit since 2006 and had the pleasure to work with John. And, also, I've known Dr. Beyene for a long time. I have worked with a bunch of your students. They're really good ones.

And the question I have is, I think, based on my past experience, I worked for Lockheed Martin, and then worked for California Manufacturing, and my own company, CanTech Energy, we're reaching to the point where we have saturated the market with industrial energy efficiency, especially in the, you know, Edison area and PG&E. And the problem is California started this initiative a long time ago and for that reason a lot of manufacturers have been hit by industrial energy efficiency.

And as John mentioned, initially we just focused on equipment retrofit. And that has been the goal for, I would say, the past 12 years, just changing the equipment initially was a lot (indiscernible) system which is now part of Title

24, or HVAC (indiscernible), you know, process equipment, heating, ventilation and air conditioning.

So the challenge that I think CEC would really want to look at it, because I also helped some of the manufacturers and agricultural companies in Central Valley to go through your Food Processing, you know, Grant Program that you have, is that how can we move forward to a more processed way of doing the energy savings?

As John noted, and I've been working with him several projects, our focus research has been on energy savings through process improvement which, I think, and a lot of people felt that way, that that continuous improvement is not going to be a stop.

So how CEC, I guess from an industrial perspective, they're going to really come to the point that we really look at the energy intensity, as the panel was discussing, about energy per unit of output? Because currently we change the equipment, they look at the savings, sort of (indiscernible). But the question is: How do you know how much production you improve or you reduce? Because bottom line, energy

intensity is energy unit of output of production. So if production goes up, energy has stayed the same, then you save energy.

So these are the questions I have for CEC, I guess for you, Mike, and maybe for the panel, that do you guys have any plan in the future to just forget about retrofit? Because, really, there is no market left, I mean, very much. I had a contact with Lockheed Martin for years. There's really no project we can do in the Edison area.

Thank you.

MR. LOZANO: All right. Just so you know, and, you know, things have changed and we can approach the way we look at projects differently, this is more of a policy question that might be, you know, some of our other CEC people can talk to you about.

But as far as the projects that we can do for research, in the old days we were -- quite frankly, it was quite a bit siloed, the program. You know, you had to get a kilowatt savings or a therm savings and it was very direct -- what is the benefit to the ratepayer? -- before you do a project. And such things as process improvement,

for instance, I mean, there could be a new process that doesn't save a lot of energy but it improves the quality of the fruit or, you know, it reduces throughput using the same equipment or in the same footprint, you know, because then a lot of urban areas, you know, just the space. So you can save a lot of money if you can make moderate improvements that can improve the quality of whatever product and also, you know, you save some emissions.

Now with, you know, AB 32, SB 350, you can look at a lot of different benefits before you can do a project. And you can sell that project to our management based on more things than just kilowatt hours.

So, yes, you know, we're looking at things differently. No, probably, we're not as far as long as, obviously, you think we should be. And, quite frankly, it's tough to change. But, yeah, we're looking at things in a different way, more holistically, not just kilowatts for projects, but that's just for research.

MR. AHMADI: Right. I appreciate your response.

I guess the challenge is how do we come

up with the realization of the savings? Because we may change the process; how do we know that we save energy? And that has been a challenge for the past, at least, 12 years because as far as I know it's very hard to measure the production in real time. The energy is very easy to measure. You know, kilowatt hours, you just put a bunch of loggers, whatever terms they mean, you can put a measurement, you know, a gas measurement. But the production is the key.

So for manufacturer, it is not just simply easy that I'm going to say, you know, I saved you energy because the production is not measured at the same time, so we really don't have the right metric to go after and prove it to the, you know, customer in the first place, then to the utility who pays the incentive, that kWh per pounds of fruit went down, and that's a big challenge and I'm still working on it.

We came up with some sort of a tool to do that for our own basket, but I don't see it anywhere, I would say, in utilities or Public Utility Commission or you guys are really focusing on that. And we really need to come up with some sort of a data collection of the energy

intensity.

MS. BIRKEL: I can answer a little bit of that.

Through the Strategic Energy Management Program that I've been talking about we measure savings based on energy intensity as opposed to net energy use. So we do that by developing an energy model, a statistical model, that factors in production, that factors in weather, that factors in any sort of variable that the site can share with us that effects their energy use and we do a statistical regression model for that. So what we end up incentivizing them for is their reduction in energy intensity, so we compare what they actually -- energy they actually used, which the meter measures, to what they would have used before they had done these activities, and what they would have used is determined through the energy model that we build.

MR. AHMADI: Do you do this after the fact, like --

MS. BIRKEL: We do it during. So we track --

MR. AHMADI: -- (indiscernible)?

MS. BIRKEL: -- we track as close to real

time as we can. So if a site is willing to report to us daily, their production, we can build it at that level. Often, we'll build a daily model but they'll provide us data once a month or something like that and then we'll update it for the whole month.

MR. AHMADI: Thank you.

MR. ZWICK: I would say, though, that there's definitely still opportunities and ways of modeling and tracking the savings, either at the building level, system level or equipment level. I think that's something that is -- perhaps some R&D effort might be valuable to help with that. And it is something that I think there's going to be some value.

MR. LOZANO: Yeah, that's true, just, I mean, but as you know, you know, that is so hard to do, even just the --

MR. ZWICK: It is, yeah.

MR. LOZANO: -- energy intensity of a cubic meter of water, you know, what's the cost of a cubic meter of water? Depends on where you are. So --

MR. ZWICK: Yeah.

MR. LOZANO: We're --

DR. BEYENE: If I may add one sentence to that?

About ten years ago, SDG&E funded research to tie energy use to the process and we collected a lot of processes, energy testing processes. We ran them based on the data we collected.

So it's a very interesting approach and I'm happy to hear that. It didn't get a lot of traction but I'm really sure we'll come back to that sooner or later because, personally, I'm happy to hear these lines of talks. And I think it is something that, at the research level, that we should and can also pursue.

MR. LOZANO: All right. And I think, since I'm five minutes over, I'm going to have to make that the final word.

So I would very much like to thank my panel. It's a great panel. And I'd like to thank the audience, so thank you very much.

(Applause.)

MR. KENNEY: All right. Thank you to our first panel.

So we are now going to have our first break, so this will be our break for lunch.

We'll be breaking, say, for about an hour, so we'll be back at one o'clock. We'll kick it off with the remaining panels.

So if you haven't already, please do sign in. We have sign-in sheets in the little entryway there. Leave a business card. And we look forward to seeing you all at one o'clock.

Thank you.

(Off the record at 11:51 a.m.)

(On the record at the 1:04 p.m.)

MR. KENNEY: Good afternoon everybody. We're going to go ahead and get started now with our second panel of today's workshop.

And just a reminder for everybody in the room, we have a sign-in sheet in the entryway. We appreciate you signing in.

And for those of you who weren't here this morning, the process for taking questions, if you can go up to the podium we have here, at the end of each panel, we'll reserve time for folks in the room and on the phone to ask questions. Please state your name. And if you have a business card, if you could leave them with our court reporter, so that way they can make sure to properly identify you on the

transcript that we will be generating.

And with that, I'm going to pass it over to our moderator for the second panel about building decarbonization, Eddie Rosales.

MR. ROSALES: Thank you, Michael.

Thanks, everyone. Hope you guys enjoyed your lunch break.

So this is Panel Two, Building Decarbonization. My name is Ed Rosales. I'm an Energy Specialist at the Energy Commission. And, particularly, I work with the Existing Buildings Office. So one of the policy areas that we're tackling right now is actually building decarbonization, particularly as interpreted through a lot of -- some of the recent and state legislative pieces and policy drivers.

I've got three panelists up here, three panelist experts who will -- we will use to explore their experience and some of their direction with their respective organizations as in regards to building decarbonization and I'm going to introduce them in a minute.

Before I get there I want to just frame, give a general frame to our panel here, which is building decarbonization. So the idea is new and

old in some ways, I think new in the sense that we're referring to this space as building decarbonization. And for the purpose of this discussion I think the general framework I would like to propose, at least from our side, from the CEC side, is the following, is that we're looking at decarbonizing energy usage at the building level. For me, on the one hand, that includes site usage, site consumption, but that also includes offsite indirect-source energy.

So together, for us, that's kind of the general framework when we talk about building decarbonization but neither of the two right now have priority to us. So we're going to, through this report and through discussing in these panel discussions, we hope to sort of gain some insights, some of their experience, and some of the knowledge you all bring.

So with that, let me introduce our panelists, and I'll start at the far left and then work my way back.

We've got Lindsey Hawes. Lindsey is the Director of Distributed Energy Resources. She's local. She's with the Center for Sustainable Energy, aka CSE. Lindsey pursues new

partnerships and funding opportunities that will remove barriers to achieving ambitious climate goals at the local, state and national levels. Lindsey and her team work to advance the adoption of DERs, supporting the adoption of clean energy policies, and administering market-transforming incentive programs.

Welcome, Lindsey.

MS. HAWES: Thank you.

MR. ROSALES: Next is Abhijeet Pande, and feel free to correct me if I mispronounced. Abhijeet Pande is a Vice President at TRC at Advanced Energy where he leads research and technology commercialization projects. His work areas encompass field research in codes and standards, as well as programmatic (indiscernible). TRC is designing and implementing programs supporting building decarbonization.

Welcome.

MR. PANDE: Thank you.

MR. LOZANO: And last, to my immediate left, we've got Alex Kim. Alex is the Director of Customer Programs at SDG&E. He's also local. Alex brings over 30 years of energy industry

experience. In his role, he oversees customer incentives, rebate, discount, and rate programs at SDG&E. He's a Certified Energy Manager and LEED-accredited professional. Alex has a Mechanical Engineering Degree from Cal Poly.

Alex, welcome.

MR. KIM: Thank you.

MR. ROSALES: Okay, so we'll start with -- I started with my framing but I'll start with the general question, then we can drill down from there.

And, Alex, I'll start with you first, and then the other panelists can chime in.

Can you maybe let us know how you are defining building decarbonization within your respective organization? And what are opportunities for implementing building decarbonization?

MR. KIM: Sure. You know, first of all, the California utilities have been involved, as you know, for, with energy efficiency, for decades now and had a tremendous success over that time. In just the past, you know, ten years alone, we've helped save our customers 3.5 million megawatt hours, 21 million therms, and,

you know, 2.1 million metric tons of carbon during just the past ten years.

And so I think continuing along with that success is really how we're looking at defining decarbonization and taking it even more broader than just energy efficiency and taking a much more holistic approach at the building, as you mentioned, Eddie. We're looking at it, not just as an onsite type of solutions, which we've been doing, I just described, with energy efficiency, but also in our portfolio. So, as you know, the utilities have been aggressively pursuing greening up the grid, as well, too, with, you know, renewable energy, as well, too.

You know, currently, SDG&E is at about 45 percent of renewable energy. And we're certain to get to that 50 percent goal by 2030. As a matter of fact, we believe we should get to around 69 percent before 2022. And so, you know, we're taking a much more holistic approach when we're talking about decarbonization of buildings. And beyond just energy efficiency and on our demand response programs but also looking at the source.

But then also taking it even one step

further about looking at transportation. So as the transportation industry start to get more electrified and even moving over to other types of renewable fuels, you know, we're looking at that, as well, too, because those fuels will now be dispensed more at the building, especially during -- for residential customers, but even for commercial facilities, as well, too.

So I think, you know, how we define it is taking a much more holistic approach than just talking about energy efficiency.

MR. ROSALES: Thank you.

Abhijeet, do you have anything to add?

MR. PANDE: Yeah. I was just going to add a couple more points. I'd like to thank Alex and thanks for mentioning that, you know, energy efficiency has always been a part of building decarbonization, so I just think it's kind of an old-new thing.

I think a couple other trends that are going hand-in-hand with that, and there's a reason by both Lindsey and I have distributed energy in our job titles and our job descriptions, so that with the increasing renewables there has been a shift in focus around

how we achieve energy efficiency. And it's not just, you know, saving peak. The definitions of peak are changing. The definitions of, you know, what's saving energy is changing.

So a lot of the building decarbonization discussion now is really framed on the (indiscernible) now of like what's the angle, what's the end result, as opposed to what am I doing on this site? So that takes multiple flavors. But, you know, at the base of it is saving natural gas and propane and electricity onsite.

What's also happening is other things are becoming a part of that. Part of it is the emergence of community choice aggregators and others who are, you know, promoting themselves as having greener, cleaner power and trying to get more people to, you know, convert certain end users or do certain things as part of that, electric vehicles coming along.

And that's -- so a lot of these building decarbonization discussions aren't really just limited to efficiency as we used to have. There's a lot of other connected components to it.

MR. ROSALES: Good points.

Lindsey?

MS. HAWES: Yeah. Sure. So kind of just building on what my colleagues here have said, you know, the Center for Sustainable Energy has always been focused on energy efficiency. But I guess organically, without having decarbonization as our ultimate goal or, you know, our North Star, we've built in programs that have been working towards that goal all along.

So, for example, here in San Diego, we are implementing the Self-Generation Incentive Program on behalf of SDG&E, so helping customers adopt, primarily at this point in the program, residential energy battery storage. And so really enabling them to, you know, save energy and use it within their buildings, ideally to offset energy consumption from the grid when it is its most carbon intense.

We're also working with local governments. And I don't want to steal the thunder of any of any of the folks who are going to be speaking on the next panel, but namely here, the City of Carlsbad, to the northern part of our county, they've been adopting quite a few

different ordinances in support of their Climate Action Plan, again, from the perspective of greenhouse gas reductions, so not really with a decarbonization underlying goal but definitely working toward that ultimate goal and, again, really trying to reduce the consumption of natural gas in new construction.

So just for example, the City of Carlsbad has adopted ordinances that are requiring new construction, both commercial and residential, to achieve -- or to use renewable sources for water heating to a large degree. So that's kind of something, I think, innovative that we're seeing from a Reach Code perspective here regionally.

MR. ROSALES: Thank you. And, Lindsey, I'll start with you on the next question.

So I think that was a good entre into understanding that although we're all organizations in the energy sector, we all are approaching a problem from different angles.

And so, Lindsey, from your perspective -- and you know, we can't tackle all the issues all at once because there is a lot of different issues you want to solve for, so we always think about what are the most opportune issues to

tackle first maybe and then how much, you know, return do we get on that?

Can you speak about that? What are some of the key barriers, from a policy point of view, from a technical point of view, that you've seen, maybe that you've encountered and learned, that weren't as obvious when you first started or you've learned more about that you already were aware of? And can you fill us in, how you're going about tackling and removing those barriers for decarbonization?

MS. HAWES: Yeah. Absolutely. I think from a policy perspective, some of the biggest barrier are pretty straightforward. And at least for the folks who are working in this industry on a day-to-day basis, pretty obvious, and it's really the cost effectiveness rules and the inability to account for some of the serious benefits associated with reducing carbon in our buildings within that cost effectiveness framework.

So from a policy perspective, you know, whatever ability the Public Utilities Commission or the Energy Commission working together have to adjust that framework to allow for accounting for

the benefits of carbon reductions would, I think, be a huge barrier that we could overcome and would make -- you know, allow this -- allow our programs to make a lot of strides.

And then similarly, from a policy perspective, the ability to incentivize fuel switching I think is huge. You know, if folks are interested in pursuing, even from a residential perspective, you know, switching out their gas water heaters for a heat pump water heater or something as small as their gas cooktop, you know? Being even -- and I'll go even further from my own personal perspective, you know, the ability offset the cost of switching out my gas furnace with a heat pump space conditioner in my own home, the ability to offset the upfront cost of that with some incentive from the state would have been fantastic. You know, I took it upon myself as a first mover to make that retrofit.

But I think if we want to see those types of retrofits occur, by and large, across the state, then we are going to need to incentive that to a large degree. And removing those fuel switching restrictions are a huge part of that.

MR. ROSALES: Abhijeet, do you want to

chime in on this? And, I mean, you work with different customers. I'm sure you work with building owners and other customers. On the customer side, do you -- you know, what can you tell us about some of those barriers that they're facing, and especially when they're confronted with options for transforming the way they consume energy in the building?

MR. PANDE: Yes. I think -- and I'm going to repeat what Lindsey said, I think some of the same points apply.

But I think a couple of other things, I should mention.

One is an individual homeowner or a building owner level, the concerns are maybe different than some of -- my customers, usually, are kind of two categories. As mentioned, one is the building owners and operators and so on. But the others are the utilities, the CCAs and others, who are trying to encourage these, exactly the kind of program that Lindsey was referring to. And the challenge there is sort of twofold. One is clear policy direction of what value you put on decarbonization, as sort of alluded to, and put beyond cost effectiveness, it

kind of goes to the point of saying, well, what's it really worth to you, right, to the homeowner or to the Agency that's giving incentives for it. And that has many implications on the scale.

A couple of examples, now, I'll make it a little bit short, but one extreme example is when we had, you know, the fires in Northern California and Sonoma and other areas were gutted. Those are being rebuilt now. And there's a lot of effort on rebuilding them the right way and decarbonization is part of that. But one of the challenges with that is how do you now take the existing infrastructure that we have for incentives for the rules and regulations around what you can and cannot do, with an idea that we have a limited window now.

So while state policy works deliberately and that's a good thing in the bigger picture, the real challenge right now is the time because you don't want to wait three years to give some guidance and then have, you know, potentially tens of thousands of homes built that you could have done differently.

MR. ROSALES: Thank you.

Alex?

MR. KIM: Well, I think that one of the biggest barriers to decarbonization is really about, you know, maybe taking too narrow or of a single focus. So as we said in our -- in my opening comments to the first question is, you know, we need to take a much broader look and understand about all the implications about just adopting new technologies.

I think why energy efficiency has been so successful and the programs have been so successful up to this time is because we've allowed our customers to have that technology flexibility as far as choosing different types of technologies that really fit their needs and not prescripting different technologies for them.

I think having that flexibility has really allowed greater acceptance because I think when you're talking about consumers, whether it's an industrial customer, a commercial customer or a residential customer, the key to success is having that consumer acceptance. Having different types of standards or codes that really go against what customers really want, you're going to get a lot of resistance and I think we've seen that proven out in the past.

And so I think we just need to make sure that there is flexibility and we're not trying to go down one specific path but allowing options for all customers and all types of sources of renewable energy as well.

MR. ROSALES: So let me drill down now one more level. Let's talk about the customers and how they -- I'm sure you all have experience now interacting with customers, talking to them, both about policy drivers, whether it's regional or local.

Lindsey, you were touching on a lot of cities now have their own goals and ambitions separate from state level.

Alex, so talking about the customers, what type of practices and projects have you seen that have been most ripe for capitalizing on decarbonization? And I'm talking specifically about, you know, either water heating measures, space heating measures and the like even, and how you've gone about trying to tackle those and trying to implement building decarbonization again, again, as you approach it and your organization approaches it.

MR. KIM: Sure. You know, I think as I

mentioned, there are different types of technologies. I do think that coming more to the forefront, especially when we're talking about decarbonization, heat pumps certainly is one area that we all know can certainly save, you know, carbon. But also, you know, understanding, though, what are the other implications to that?

So again, when I'm talking about taking a holistic approach to this, for example, with rooftop solar, when rooftop solar was first introduced with SB 1, you know, there wasn't -- there was, initially, a lot of talk about, you know, how is this going to affect the grid and what are the grid impacts going to be to be able to accommodate high levels of rooftop solar. And that continues, you know, to still be a discussion and certainly a challenge for utilities.

And along the same way, I think we're talking about different types of technologies that can put a significant additional load to an infrastructure that really wasn't built for that load. And that's why electric vehicles, for example, are a really good way of being able to

add load because those loads are much more controllable when they're going to be utilized versus, you know, heat pumps, for example, you know, a lot of times that load is needed in the residence, let's just say, when people get home; right? You're using the hot water when you're at home. You know, you need it for your heating and cooling when you get home from work.

And here in San Diego, we have, as was mentioned early in the panel today, you know, primarily a residential and small commercial base. And so, therefore, our peak is certainly during those critical hours. And so we needed to also make sure that we balance and understand what other implications are needed when we're adapting these new technologies.

And so while those are good solutions on the face, we also need to look at the downstream implications, as well, too, and the interconnection of those types of technologies.

MR. ROSALES: Thank you.

Abhijeet, do you have some takeaways from projects you've been working on and how folks have reacted to them and how you've helped guide them through them?

MR. PANDE: Yeah. Absolutely. I think I should mention that there's, obviously, there's early adopters and, you know, both like Lindsey and others who tried it out. I've done that in my house. What's encouraging and also, I think, challenging, I think, you can sort of touch on it a little bit, Alex, I'll touch on it a little bit, which is on the one hand there's a lot of technology options that didn't exist five years ago.

So just take heat pumps, for example. The heat pumps available today are far more efficient than they were just five, you know, six years ago. The challenges around supplemental heat or (indiscernible) heating coming on and how you control for that, the newer products are doing a better job of that. There are replacement-ready products available that can work sort of limited electrical capacity. The challenges are availability and, you know, knowledge and so on. So all of the issues you mentioned are absolutely true.

What's missing, I think is the element of training and education and outreach to the broader stakeholders. So, I mean, if I wanted,

and even let's say you, as a utility, want me to do it, there are people in between where your intent and my intent lies which is all of the supply chain, the installers and so on, and that's where the gap is in terms of, you know, the technology and the knowledge that's required.

I should mention, I think Lindsey touched on this, as well, is a lot of hard work right now has been actually driven by local government, so cities, you know, counties and other local governments that are trying to promote this decarbonization both as a way to address their Climate Action Plans, but also address some of the local constraints and other issues. So I think it's coming from both places. In some cases, there's a natural gas-related constraint. In some cases, it's electricity delivery constraint.

So I think you can't ignore those issues but I think what we need is a much more holistic view of where it's working well, why it's working, and more importantly, where it's not working and why it's not working so we can fix it.

MR. ROSALES: Thank you.

Lindsey, do you want to add?

MS. HAWES: Yeah. Sure. I think I want to speak to two points here.

So one of the projects that we are working on right now, which is actually funded through the EPIC Program at the Energy Commission, is providing education and training to inside wiremen to install automated demand response controls technology to enable buildings to respond to remote signals around demand response and, ideally, at some point, you know, respond to signals that will allow them to use energy when the grid is least carbon intensive. And so we're excited about that as an opportunity to really learn about what the best practices are going to be.

So at this point I feel like thinking about the programs that we're implementing from a decarbonization perspective strictly is relatively new. Again, it's old but it's a new lens through which to view the work that we are doing. And so it's a new opportunity for us to really identify best practices.

And the reason I bring this automated demand response education and training program up

is because we're learning really interesting anecdotes, things like these controls technologies, you know, we work with facilities' manager to figure out where in the building the best place to install these technologies might be and we've found, through trial and error, that installing them in a basement, you know, behind several cement walls is going to limit their ability to receive signals.

And so just very simple, practical application lessons learned and best practices, I think, are right at our fingertips. And we're really on the verge of uncovering and identifying some of these really exciting and practical and useful best practices, so I'm excited about that.

The other best practice that I think is really valuable that has been a best practice all along for everyone who is in this industry is and will continue to be with regards to the decarbonization lens, is really just meeting the customer with regards to their needs and their pain points. And so I think similarly with energy efficiency, a lot of the messaging that we're going to have to use around decarbonization is going to have still rely around health and

comfort.

Speaking to my own heat pump installation, I don't mean to toot my own horn as a first mover, it actually was not a smart move for us, but we did in large degree because it was a health and comfort issue for our family.

And so if we can continue to understand what the pain points of our customers are and harness those to help deliver those decarbonization solution, I think we're going to, you know, continue to see good gains in this, and I think that's a really important best practice we can't forget.

MR. ROSALES: Thank you. Good point again.

Abhijeet, I'll start with you --

MR. PANDE: Um-hmm.

MR. ROSALES: -- on the next question. So you guys have brought up some really important issues to think about from a policy perspective. Alex obviously was mentioning, you know, about decarbonization, in large part, does also mean a huge increase on the load side. And planning and resources have got to be, obviously, a part of that equation.

The other part of the occasion, though, is as you're moving towards decarbonization at some given pace, there's a lot of players in this space that, some of them are not here in this room, that we -- that decarbonization needs to rely on in order for us to reach those groups. So I'm talking about trade groups. I'm talking about installers. Also, manufacturers, you were talking about advancing in heat pump technology, but there's probably still ambition for it to even advance further.

So can you answer what opportunities exist for folks like you, like TRC, to leverage efforts on decarbonization with some of those players? Now, maybe you could just pick one or --

MR. PANDE: Sure.

MR. ROSALES: -- or maybe two to speak about in terms of both the challenge but also some of the solutions that are possible to bringing them over.

MR. PANDE: Yeah. Absolutely. Let me just take one example because there's multiple ways you could answer this.

So one particular example is we are

working with one of our utility clients who has a program supporting heat pump space heating and heat pump water heating. And as Lindsey was alluding to, like the challenges are often that most homeowners aren't educated about how to make that choice. So let's say I make a choice to install a heat pump. I go to my trusted contractor. The usual case in a retrofit is a like-for-like; right? Whatever you have on your truck. My water heater broke five years ago on a July 4th weekend with two families visiting me. I need a new water heater on July 4th, maybe July 5th.

And that's a big issue and so that's where we're working with our clients on how do we address sort of issues around, one, go away from the sort of like-for-like replacement? You know, just because you had a three-ton system before means you put in a three ton as opposed to using that as an opportunity to say, okay, well, what do you really need? And going back to your point, like is three ton enough? In many cases, systems are oversized and people are literally wasting money putting in a system that they don't need.

And so there's opportunities to save costs and actually provide better comfort if you actually take some time to do it. But that involves training those trade allies and the, you know, the installers and the distributors and so on, on bigger is not always better; sometimes it is, most of the times it's not. And so that sort of training and education challenge, we are working with our clients to sort of put some guidelines, put some, you know, case studies, put some dos and don'ts. You know, everything ultimately boils down to how simple can you make it? Nobody has time to spend, you know, six hours in a room getting trained on how to do manual (indiscernible) calculations.

So we are helping our clients put together simplified tables saying, okay, if you were in this house that had a two-ton system and you have -- you know, you're in Sacramento, let's say, or you're in San Diego, what kind of HVAC system size you typically need based on typical load profile? And so if you don't want to do your own load calcs, make sure you don't just choose something random because you have it on your truck.

So even simple things, like educating, you know, what (indiscernible) tons are so that they can use, that actually goes a long way.

MR. ROSALES: Thank you.

Alex, and I'll turn to you, too, you know, you work with the utility, the local utility here. You don't work, obviously, in -- you're not islanded away from all the different players out there.

So apart from the customers, what other groups do you work with in order to advance sort of greener buildings and decarbonization of the buildings? And it could be either from the residential sector or the commercial sector.

MR. KIM: Sure. And I'll actually speak a little to both because I think Abhijeet, you know, touched on a few of those.

And I think when you're talking about decarbonization and the education aspect of it because we've been -- well, a major part of our program is really, you know, the education of our customers, but also the education of the suppliers, of the installers, the distributors. And so that's why we have both midstream incentives programs, we have upstream incentive

programs, but we also have, you know, direct install and direct rebates programs, as well, too. Because you really have to, you know, have that, those incentives, you know, throughout the entire chain, but also the education part throughout the entire chain, as well, too.

Because, you know, Lindsey touched upon it, you know, in addition to comfort, I think people want convenience. You know, who has time, like Abhijeet said, to spend a couple of hours thinking about, you know, what the greenhouse gas impact and the carbon impact is going to be of this system that I need right away. You know, most of the time they're thinking about what is the cost of the system, what does it look like, how does it perform, is it going to last, how much is going to cost, are their top questions.

And so I think being part of that education process and getting customers to understand about how to look at their purchases in a different manner, but not doing it at the time of purchase; right? You can't do it at the time of -- at their greatest time of need. You have to kind of bring that -- bring them along, essentially on a journey.

You know, for example, one of the things that we've done at SDG&E is, you know, we have our Energy Marketplace. And our Energy Marketplace is somewhat unique in a sense that, you know, it's one of the few places where you can actually -- you know, kind of like an Amazon where you can actually compare different types of equipment.

Well, here it's comparing different types of energy equipment, like thermostats, or maybe washers and dryers, but also have an energy rating associated with that and to be able to compare the energy rating of one appliance versus another appliance. And so you're not just looking at it. It's just one of the features, in other words, that you're looking at when you're looking at an appliance.

And so I think taking innovative approaches like that will really help consumers to start to understand that there's, you know, maybe there's one other thing you may need to consider when you're buying something. But you really can't do it, like you said, at that greatest time of need, right when they're making that purchase. It's sometimes going to work and

we have point of purchase sale rebates. But other times, and most often than not, you're going to have to take them along that journey.

MR. ROSALES: Lindsay, do you want to add to that?

MS. HAWES: Yeah.

Alex, that was a really great segue to the point I was going to make here, is that one of the groups of market actors that I think has the potential to play a fairly large role here is actually the real estate industry. Speaking of, you know, decision making and data points that you consider when purchasing an appliance, you know, purchasing a home is one of the largest carbon-intensive purchases we're going to make in our lifetimes if we're that lucky, especially here in California and San Diego.

And I think, you know, engaging the real estate market and educating them around this decarbonization topic and really giving them the tools that they need to have this conversation in a way that resonates with their clients, with their potential homeowners, home buyers, is a great practice or a great best practice that we should be pursuing.

And I think home energy labeling, similar to appliance ratings, is potentially a great way to do that. I applaud our local government partners here for initiating the Home Energy Score Program.

And I'm excited to see, you know, progress in that realm and our ability to have meaningful conversations with potential home buyers that, again, speak to their needs, speak to their pain points, and help them understand that the cost of home ownership is not just that initial purchase price or their monthly mortgage, but it's also the cost that they are spending on their utilities and their energy consumption, as well as the ramifications associated with climate change and how that purchase and the appliances and the efficiency and the carbon intensity of their homes and their behaviors can play a big role there.

MR. ROSALES: I agree. Thank you.

Alex, I'll start with you.

MR. KIM: Um-hmm.

MR. ROSALES: The next question regards evaluating performance in this space. We've got different programs. We've got different

objectives. And, you know, when we look back on what we've done, maybe in a year's time or maybe on a quarterly basis or whatever interval works best, how are you evaluating success and what metrics are we using to evaluate it? Is it an energy metric? Is it an installation rate, a transformation rate? Can you touch on that and kind of let us know how you guys go about evaluating effectiveness?

MR. KIM: Sure. You know, I think there's -- well, I'll just start off how we -- you know, with our energy efficiency programs, we certainly look and measure our kilowatt hours saved and our therm savings and how that translates into carbon reduction, as well, too. But we also, you know, take the time, also, to do EM&V, right, to evaluate and measure and verify that information is correct. Because that really determines then how effective are we with our programs, both from a cost effectiveness standpoint but also being able to achieve eh goals of the program, as well, too? And then from that we're able to then be able to determine, you know, what things should we continue doing, where do we need to streamline

things, and what things, you know, do we need to stop doing?

And I want to just touch on a point that Lindsey said only because she mentioned the real estate industry and my wife happens to be a realtor, a local realtor here in San Diego. And I think when we're talking about, you know, measuring success, it's also about how we're engaging with our different audiences. And so, you know, I'll use the analogy of like with our Electric Vehicle Program and reaching out to local dealerships, for example, and talking about, you know, electric vehicles and the benefit of electric vehicles. Well, the dealer or the realtor, you know, they are there to sell you something; right? They're interested in, okay, how do I increase the value that I'm bringing to my clients and how do I, you know, help make that sale move along?

And that's what we really need to understand when we're measuring success, as well, is like how well are we targeting our messaging to our audiences and how is that message being received? And how effective then are we at moving those industries to support the goals that

we have, as well, too?

So I think that's also a very important measure that we need to also continue to look at and making sure that, you know, we're measuring those touchpoints. We're understanding what our customers want, what our partners want, what the industries need, because we need them all to be working together and not just looking out for the overall goal but, you know, how do we help them meet their goals, as well, too?

MR. ROSALES: Thank you.

Abhijeet?

MR. PANDE: I completely agree with you're saying. I think the only thing I would add, maybe on the measurement and evaluation side, is our formal EM&V processes take a long time. And especially with how fast this whole industry is evolving, I think one of the sort of the new things that we are really excited about is real-time M&V. So there's the evaluation component, the E part of EM&V. But I think the M&V is very important because that's where you can make real-time changes and real-time feedback on what's working, what's not working. And you're right, I think there's a far more robust

infrastructure for the energy M&V side of things.

But equally important is what we've all mentioned multiple times which is the comfort, the value that this particular, you know, decarbonization strategy brings to the customer. So a lot of that is really a different type of an evaluation science than, you know, sort of a quantitative, you know, look at the bills and so on.

And so a lot of the work that's happening right now is understanding not just the proof of the volume, but also what that volume is doing to the customers. You know, are you happy? You know, was it a financially good decision for you or for your 50 peers? You know, because that's really what's going to determine future success of this because one could declare success saying, yes, we, in our case, you know, we started with a small program trying to target 100 homes to do decarbonization, you know, electrification; far exceeded that goal. You know, we have something like 250-plus homes in there.

So from that metric, and terribly successful, then we can declare success. But the ultimate success is whether those 250 people

would do this again if they were given the choice, and that's the real rub.

MR. ROSALES: Thank you.

Lindsey?

MS. HAWES: Yeah. Really valuable statements. I don't need to necessarily repeat but definitely agree. But I would say that there are two other metrics that I'm going to add to the list and those are resiliency and equity. So I know that local governments and other players in this space are increasingly relying on resiliency as a metric to gage the success of these efforts and I think that's really critical. And, you know, understanding the impacts that some of these fire-ravaged locations and the rebuild efforts that they're undertaking right now, you know, to the extent that these decarbonization development efforts are allowing them to be more resilient in the face of future disasters, I think that's a really important metric that we need to keep our eye on.

And then equity, something that my organization is focusing on more and more these days is that equity focus and just trying to understanding how we can bring the benefits of

decarbonization, as well as, you know, all clean energy solutions to, you know, everyone, essentially, in our communities, whether those are folks who are financially able to be the first movers, as well as the folks who are not and who are often, unfortunately, subject to some of the more negative ramifications of choices that were not theirs to make.

And so if we can bring these types of solutions in a cost effective and affordable way to folks who were otherwise unable to tap into these solutions, I think that's a fantastic way to go about it. And we need to keep that equity metric at the top of our mind.

MR. ROSALES: Thank you. Good answer.

I've got one last question I'm going to share with you now so you can think about it. Then I'm going to pause before you answer because I want to get some audience questions, so I think it's good. It will give you some leeway to think about it.

But the questions is this: What critical areas do you believe the State of California can help -- be most helpful in? And by that, I mean the state agencies, CEC, obviously, but also the

PUC, the Air Resources Board, or maybe even (indiscernible), so I'm thinking mostly the energy sector and closely related to building decarbonization. Think about that for a minute. I'm going to turn to our audience in the room, and also on WebEx, to see if there's any questions we can field and then I'll come back to that.

So if there's questions in the audience, feel free to come up to the podium and we can field those questions.

MS. BIRD: We have a question on WebEx.

MR. ROSALES: We've got a question on WebEx? Okay. We'll field the one from the audience first and then we'll go the WebEx.

Okay. We've got a question.

MR. HANACEK: Hi. John Hanacek with a company called Can Cover it. So we're doing a modular retrofit solution for (indiscernible) in an attic. So we see that there's a big potential and a big gap between making energy efficiency something that's more modular, so kind of like second stage. Because we've got the energy efficient lightbulbs and that's some percentage. Well, let's see the rest of the pie with a

modular way. So the way we approach is a high efficiency attic (indiscernible). So we have to redo the same thing that was already done but be approaching building envelope, which is something that sometimes it could be a little bit disconcerting that we don't talk about building envelope first before we talk about electrification because building envelope kind of is the platform by which you can size other systems.

So, you know, I just kind of want to throw that out there of like where do you see just, nuts and bolts, building envelope stuff come into play and how can we better educate both homeowners and the installers who are still not quite connecting the dots on not just air sealing needs but the thermal transfer need and some of the deeper science to help to bridge those gaps.

MR. ROSALES: Yeah. Abhijeet. Go ahead, Abhijeet.

MR. PANDE: So I can take a first stab and then others can join.

So I think definitely still on point because I think what we've been talking about maybe -- and I didn't mean to imply that

everything is kind of like-for-like replacement. I think there's definitely value in having systems solutions. And the more we can simplify those and modularize, as you say, is an issue because for most people when we talk about existing building efficiency retrofits, it's kind of a big deal. It's a difficult thing to do because it's going to cost a couple thousand dollars to get somebody in my house to rummage around, see that's there. And then a few more tens of thousands of dollars, maybe, to do something.

So the more we can simplify that process to say, okay, well, for your house that's built in 1920s, here's what we can do for you and you don't have to spend, you know, $5,000 doing that. It's a great idea. And I think there are definitely (indiscernible) like that that have been supported.

And you bring up a good point about the building envelope. Particularly, I think there are several efforts that are trying to address that issue, whether it's just for the sake of the envelope and, as you said, sir, do the right thing and have a good envelope. But, also, I

think I mentioned the grid impacts. I think one of -- and I can reiterate the fact of like like-for-like replacements, one of the things we're doing with our clients is saying, well, if somebody's going to spend $5,000 on replacing their air conditioner or their furnace with something new, that may be a time to put in another $1,000 to do something else that reduces the load. And then you can go down from a three ton to maybe a two-and-a-half ton, save some money there, and overall it's the same amount of money. And so I think -- so that message is getting across.

I think the challenge is, I think you mentioned, which is that you can do that when it's the time to replace that, you know, that furnace or that air conditioner. And that's where you need to coordinate between the insulation installer and the HVAC installer and have that team available so that you're not hunting for it at the last minute.

MR. KIM: The only thing I'll add is, you know, currently the California utilities are, you know, moving to a third-party model with our energy efficiency programs. And this is -- part

of the reason of what you just described is one of the benefits, you know, where we're hoping to see from that. Innovative ideas bring people together to come up with unique solutions, let's just call them, that, you know, maybe we have not considered before. And so we're really hoping that we're going to get some really good innovative proposals from them because I do think there's a lot of really good innovative solutions out there. And I think there's a great opportunity for those to start coming forward.

MS. HAWES: And I would just add that I think what I said earlier about health and comfort and some of the more -- or, I guess, less energy specific needs of our customers are -- we can't forget about those. And I -- you know, anytime we can systemize a solution and then also sell it in a way that speaks to the specific needs of our customers is going to be super valuable and hopefully successful. And I, really, I think your technology speaks to that directly. I mean, we can talk to a homeowner all day about the energy consumption and, you know, the ability of your product to reduce that consumption.

And here in San Diego where the temperature is very climate, they may not really care about how much thermal load they're getting from their attic when they can put a solar system, you know, on their roof. But they will care about the contaminants that are coming from their attic through unsealed, you know, recessed lighting, et cetera, especially if they have health concerns in their home or asthma or some of those, you know, other, I guess, less energy-related concerns.

So we can't forget about those metrics. And I don't anticipate that we would pursue this decarbonization goal without, again, really relying on meeting the needs of our customers and using whatever it takes, whatever messaging it takes to meet those needs.

MR. ROSALES: Great. So we've got a question on WebEx and I think it's going to come over the intercom here or the speaker here and then we'll be able to hear it.

Go ahead.

MR. ASHTON: So hello. My name is Scott Ashton. I'm the CEO of the Oceanside Chamber of Commerce. I just want to share a few thoughts on

behalf of our business community. And while the impacts to this are potentially far-reaching, I want to focus specifically on our restaurant industry.

So our restaurants operate on an extremely narrow profit margin which are already being minimized by increasing labor and operating costs. And our restaurants rely on high-energy, high-efficiency natural gas equipment to cost effectively run their operations. Electrification could force our businesses to replace their gas equipment with electric equipment at a substantial expense.

So I reached out to our restaurant community and was met with a great deal of concern from our independently-owned restaurants. Amongst the topics of concern were, of course, the cost of replacing the equipment which, in some cases, could exceed a quarter-of-a-million dollars for some of our small businesses. And residual costs would also possibly be insurmountable for many of our mom and pop restaurants. It could include the cost of construction, rewiring of buildings, removal of gas equipment, gas lines, permitting, et cetera.

So our restaurants would also bear the expense of shutting down operations indefinitely during the conversion process. And one of our local restaurant owners estimated the cost to be $6,000 to $7,000 per day.

So even a relatively short shutdown of operations would also result in the loss of loyal employees. Many of these employees live paycheck to paycheck and can't afford a shutdown of any length. So that leaves the businesses to bear the expense of rehiring and retraining employees.

So for the businesses that survive the conversion process, they're also left with a variety of long-term issues, such as ongoing operating costs associated with using gas versus -- electric versus gas. And for many of these businesses even a small change in the bottom line could be a backbreaker.

So another issue is the loss of productivity resulting in the loss of revenue. So one of our small restaurants said the use of electric fryers rather than gas fryers would greatly slow their productivity and their ability to keep up with the demand, especially in the summer months when they have lines outside their

door waiting for their fried fish.

A local Thai restaurant owner pointed out the impacts specifically on Asian restaurants that prepare food cooked to order. He said, "We do the majority of our cooking on a gas wok and there is no electric alternative that can get the high heat required in a short burst to perform our style of cooking. It would result in eliminating 75 percent of our menu or, more bluntly, putting us out of business."

So a loss of quality was also a concern as an electric cooking does not offer the same level of temperature control as gas.

So as you consider implementing decarbonization policies, please keep in mind that sustainability is not just about the environment, it's also about jobs, community and the economy. And rather than mandating a narrow path to decarbonization, I urge you to take a more balanced approach that allows for multiple technologies and multiple fuels to compete.

Thank you.

MR. ROSALES: Thank you, Scott. I didn't hear a direct question but that was a good comment, and maybe we can offer some response, so

I'll let the panelists respond to that.

I would -- I think are excellent points. I would just add that we're not equating decarbonization to electrification. This is the fifth panel we've been on and I'm very sensitive, obviously, to businesses.

And that, for me, that brings up the question, customers are different by their very nature. Definitely, if I was operating a restaurant, and if I'm interpreting decarbonization to mean strict electrification, that proposition does seem very scary.

So I don't know if you guys want to tackle it from that angle, in terms of working with different customers who have different needs just by the nature of the way the building is designed.

So I'll let, maybe, Abhijeet, maybe you want to take a first stab at it?

MR. PANDE: Sure. Yeah. Thank you for that question because that's a question that we are dealing with squarely on a couple of projects. And you're absolutely right that you don't want to mandate something that's going to have an adverse effect on a business or, you

know, not just in terms of the profit, necessarily, but the way they do things.

Having said that, I think maybe there's a perception that something's going to be mandated that everybody must do something like this. I think that doesn't have to be sort of a binary choice of like everybody does it or nobody does it.

And I think that one of the things that working with our clients and our customers and some of those include building developers that have, you know, restaurant specialty and so on, is how can we be -- kind of make this as part of the regular process?

So in other words, again, going back to, I think, the point of this, which is not every restaurant keeps the same equipment for years and years. Some of them do but there is planned renovations, there's planned replacements. How can we time it so that it's not an additional mandate that's above and beyond what they would do anyways?

And you're right, it's not always just electrification. It's also, even if you are using the gas equipment, there are efficient

choices available, even simple things in restaurants, like the exhaust fume hoods that you use and how much energy they use. You may not touch your fryer or the wok. I could Asian food so I know what he's talking about. But, you know, that exhaust definitely is an electric appliance already.

So reducing the, you know, energy use of that, addressing the, you know, the pollution that cooking naturally creates in a kitchen, that has energy impacts and, also, health impacts. So I think we are trying to address both of those.

MR. ROSALES: Thank you. I'm going to -- unless there's anything burning you want to add. Okay.

MS. HAWES: I was just going to --

MR. ROSALES: Lindsey, go ahead and add.

MS. HAWES: -- I was just going to add that I think the comment on the WebEx really points to this upstream component that we can't forget about. And if the -- you know, I hear what you're saying and I agree, decarbonization is not strictly electrification. But if we are to move in that direction, technology does need to improve and we need to provide technological

tools to -- I mean, I want to continue to eat delicious Thai food that's made with a burst of energy. And so if we can get that from a low-carbon fuel, you know, let's figure out how to do that and provide that solution in a cost effective way so that I can continue to get delicious Thai food in Oceanside.

MR. KIM: I'll just add one other comment and that is, you know, it's an excellent point. And one point that we really haven't touched on that much is, you know, in addition to those upstream effects, part of that is, you know, our rates here in California. You know, unfortunately, you know, we have some of the highest electric rates in California. Now, I understand from a bill perspective, at least from a residential perspective, it might be somewhere in the middle from a national perspective.

But, you know, the fact of the matter is, especially as we're moving all of our customers towards time-of-use pricing, which is the right thing to do, you know, that provides different price signals for customers. And especially our small business customers, who are now on those time-of-use rates, too, we really need to

understand how it does impact their businesses.

And so the rate structure also needs to be part of the equation, as well, too, in how we are addressing rates to make sure we're giving the right price signals to customers, not just for carbon reduction but also for grid resiliency, as well, too.

MR. ROSALES: Thank you, guys.

I'm going to move on to close, so we can pose the final question and then wrap up the panel.

So going back to the question, if you've thought about it, if you've got an idea, and we'll try to keep it brief so we can wrap up. And I'll start on the far side so, Lindsay, we'll start with you and then we'll work our way this way.

How can the state or state agencies be most effective to you in the mission here?

MS. HAWES: Yeah. I'm just going to make it -- bring it full circle to my first comment which is around the cost effectiveness framework. Give us a carbon-based metric or allow us to account for carbon in the cost effectiveness framework.

In parallel, just to keep it short, there is an effort around the Energy Code, as well, outside of the, you know, the cost effectiveness framework for utility programs. But there's an effort amongst industry professionals for a carbon-based, potentially, carbon-based metric for the Energy Code, an alternative compliance pathway that would allow for compliance to be achieved based on some other metric aside from, you know, what's provided through our typical Energy Code modeling tools that could potentially have a carbon baseline. So that's really exciting. And I know the Energy Commission is in support of that and I'm excited to see where that goes.

MR. PANDE: So just spinning on that, I think two points, one on the CEC side and one on the PUC side.

In the CEC side, I think I really believe what you said about the cost effectiveness metric and the carbon. The other part is, I think, structurally, Energy Commission, through its part in setting building standards, can actually allow for more of these decarbonization measures. And one good example and, actually, customer choice

related example is the 2019 New Construction Code for Residential Buildings where you now have a panel attached for all electric or mixed fuel. And both of them get you to an efficiency. Both of them get you towards, you know, reducing your energy footprint. I think we need more of that.

And what we are hearing from many of our customers who are actually trying to do the right thing is often times the way the code is written is bad here, and the code in two senses, code as in the code language and the code as in the computer code. And so that's where, I think, we're already talking with the Energy Commission. I think, you know, you guys are doing a great job. But I think that's where, again, everybody's doing the right thing, it's just a question of time and resources.

And on the PUC side of things, I think that's where things need to align in terms of program metrics and program success metrics with whatever the Energy Commission is going to use, whether it's the carbon of whatever it is. Because right now there's a little bit of a disconnect between what a utility can claim savings, like if it's a third party doing a

program, can claim savings versus what these (indiscernible).

MR. KIM: And I'll just add, you know, three main points, and two of them I've already made, but one of them, again, about flexibility and, again, just making sure we understand, you know, what it -- you know, that we don't have unintended consequences, whether that's, you know, related to affordability or competitiveness, we need to make sure that we're -- you know, that the rules also consider that.

Secondly is related to not just metrics but having the right metrics. We want to make sure that the metrics are getting the greatest amount of greenhouse gas reductions but also making sure we're not discouraging, you know, innovation, like the comment that was brought up earlier, but also kind of achieve cost effectiveness. I understand we have to address what cost effectiveness is but, you know, we want to make sure that it is cost effective, as well, too.

And lastly, I will say, is simplicity. You know, when it comes to regulations we want to

make sure that -- regulations certainly are necessary and needed but we don't want to overregulate while we are driving out innovation. We're making it much too complicated, you know, for customers to participate in programs, as mentioned on the panel this morning.

And so simplification is certainly something that we need to work at and make sure that we have, you know, from a regulatory standpoint.

MR. ROSALES: Thank you, Alex.

I'd just like to, before I conclude, I'd like to say this has been super helpful because this is why we have the panels. We're filling in the empty box, so to speak, getting all the perspectives and insights and I think they all have value. And definitely, even the comment off on the WebEx, it's something for us to -- everyone to consider about how we start going down this path.

So thank you for your time. Thank you for sharing your insights and your expertise with us. And with that, I'm wrapping up Panel Two.

Thank you.

MS. HAWES: Thank you.

MR. KIM: Thank you.

MR. PANDE: Thank you.

(Applause.)

MR. KENNEY: All right. Great. Thank you to Eddie and our second panel.

So now we're going to move on to our third panel of the day. This is on local government energy efficiency action. And it will be moderated by Brian Samuelson from the Energy Commission. So I'll pass it on to Brian to introduce his panelists.

MR. SAMUELSON: Hello. My name is Brian Samuelson with the California Energy Commission. I'll be moderating this panel and I'll be introducing our guests.

First off, Heather Werner. She is the Deputy Director of the Department of Sustainability at the City of San Diego. She has over 15 years of experience in business strategy, policy analysis, and project management in multiple industries. She was recently the principal of Semper Varia, a local consulting company providing operational and strategic guidance on market opportunities and risks for companies throughout the distributed energy

industry.

Before her return to California, Heather spent several years with the U.S. Department of Defense in Afghanistan as a founding member of the Energy Program for an Economic Stabilization Task Force, specifically market-based rural electrification projects and energy resource development transactions.

Heather holds a B.A. from Amherst College and a master's from London School of Economics and Political Science.

The next one is Cory Downs. He is a Conservation Specialist with the City of Chula Vista and manages their Residential Energy and Water Efficiency Outreach, including retrofit financing, residential evaluations, and the Chula Vista Climate Action Challenge, and climate action planning efforts, including greenhouse gas inventories and capital implementation.

Before working with the city full-time, he was an Environmental Scientist with AECOM --

MR. DOWNS: AECOM.

MR. SAMUELSON: -- AECOM and Climate Fellow with ICLEI.

And then, finally, we have Anna Lowe is

an Associate Regional Energy Climate Planner at the San Diego Association of Governments, also known as SANDAG, where she leads energy efficiency efforts and serves as Staff Liaison for the SANDAG Regional Energy Working Group. She provides technical assistance to local governments and facility collaboration on energy efficiency and climate change planning through the SANDAG Energy Roadmap Program, an also manages regional plug-in electric vehicle readiness planning efforts through Plug-in San Diego and represents SANDAG on the San Diego Regional Energy Partnership and the San Diego Regional Climate Collaborative Steering Committee.

So welcome. All right.

So with this, with the questions, there is no set number, like you have to pattern an organization with. When you have an answer that you want to share, go ahead and share it with us.

So I'll start off with the first question: What energy initiatives are you proudest of in your jurisdictions?

MS. WERNER: Okay. Well, so San Diego, obviously, the big one that now encompasses most

of our initiatives when it comes to energy and energy efficiency is the Climate Action Plan. San Diego is the first city, major city, to pass a legally-binding Climate Action Plan. That includes, from an efficiencies perspective, a whole bunch of targets, some of which we have beaten already, which is always nice, and some of which we're still hitting. The big ones for those are, in terms of efficiency, reducing energy by 15 percent per unit in 20 percent of residential households. This is all by next year. We then have 2035 goals, so 15 years after that. Reducing our municipal facilities by 15 percent. And then we have water efficiency targets as well.

We started doing efficiency programs. Some of the fun things that I've learned, and I joined the city about two months ago, so fair warning, is that we've been looking at -- we've had efficiency requirements on municipal buildings, and especially municipal construction, since about 2003. We had established what is the equivalent of LEED Silver requirements for any major retrofit for any of our municipal buildings. So that's been ongoing since -- well,

for a while.

And now one of the really fun initiatives that we're looking at is really the deployment of better technology, and that's everything from IoT capabilities and building management software systems to our Smart Streetlights Program that started as a look at a massive LED retrofit of all of the streetlights in the city and actually has expanded to be a smart sensor and smart streetlight platform, so that not only are we still seeing those energy efficiency gains in our streetlights but controls around dimmability, so you're not just getting just the savings compared to one energy profile versus the other on a light but the ability to actually control when you need that light on, at what level of lumens, et cetera.

And then sensor nodes which are also then tracking things like parking in and out so that you can better plan curb management to decrease VMT and greenhouse gases from that side.

And better transit and transport, along with a bunch of atmospheric sensors, so that you are feeding back in to other building management systems in the area so that you are using the

most efficiency profile for any building system on any given day.

So those would be, probably, my top three.

MS. WERNER: You can go.

MR. DOWNS: Sure. So Cory Downs from the City of Chula Vista.

You know, I would start with we're proud of our municipal building management. We've been doing energy management of municipal facilities for a while. We've reduced energy consumption 54 percent below our 1990 inventory while adding a significant amount of buildings and more population that those buildings are serving. So, you know, I think it's good to just kind of lead by example and show the residents that these are things that, you know, we wouldn't be asking residents or businesses to do something that we're not doing ourselves.

Another thing that we're particularly proud of is how widespread we've encouraged or widespread energy efficiency has gotten at our city facilities and city operations. You know, we've incorporated it into our business license process, which is something that, you know, a lot

of jurisdictions have some authority over. We've incorporated energy efficiency in our library, in our recreation centers, and in a lot of the ways where we're already naturally touching residents and businesses that the state's looking to encourage energy efficiency in, so kind of the breadth of our energy efficiency.

And then the last one I'll mention is our participation in the Georgetown University Energy Prize. It was a two-year nationwide competition of medium and small jurisdictions across the nation looking at residential and municipal energy consumption. And we were able to come away with first in Overall Energy Score Award, which means at the end of all the two years, our residential and municipal sector reduced their average energy consumption more than any of the other 50 cities participating.

And I think a lot of that, and that's something I made sure to talk about, were the advantages we have being in California. There's a lot that, you know, we didn't necessarily have to worry about because the state is helping us and encouraging energy efficiency. But there were other California cities that were competing and

we were able to outperform them.

So it's really good to -- we talk a lot about the qualitative benefits of some of the programs. But it was really great to see someone run some numbers and say that we were saving the most.

MS. LOWE: And SANDAG sits in a funny position in the sense that our Board of Directors, our decision makers, are made up of all of our member agencies throughout the region, so that's the 19 jurisdictions, the 18 cities and the county, so the two amazing jurisdictions that have representation here. And then the County of San Diego, as well, has a very strong program.

So what SANDAG has done over the years, because we don't actually own much in the way of facilities, is providing assistance to those member agencies that don't have the capacity to really do what these other jurisdictions are talking about doing. And so there are 16 of the jurisdictions here in the region that we prepared Energy Management Plans for over the years and it's helped really identify project opportunities and helped implement those projects.

And so I think kind of like a proud

parent, it's just really great to watch the folks that we've been able to help identify opportunities and then actually see them through to the ground -- or get into the ground.

But, you know, on the same token, it's also challenging in the sense that we don't necessarily have funding to give them to put those projects in. And so that becomes a challenge too. And so it's then helping identify other ways with which, kind of like with the previous panel we're talking about, how to message energy efficiency and how to integrate energy efficiency into some of the more mainstream, you know, processes and procedures that they already are working on to then get those types of measure implemented without even, you know, having to raise a red flag or a different flag, so to speak.

So just it's really great to see folks come together and to see the needle move kind of collectively.

MR. SAMUELSON: Well, thank you.

We'll move on to the second question. And to let you know, with the second question, there will be three follow-up questions to that.

So the question is: How do those initiatives address energy efficiency?

MR. DOWNS: Yeah, so I'll just kind of start there.

So for us, you know, looking at our municipal facilities, we look at energy efficiency first. And there's, you know, where I get to say it's not necessarily the environmental benefits; our Finance Department doesn't want to pay utilities. So they have a very strong incentive to looking at energy efficiency and how they can reduce those.

You know, some of the other, the GUEP, or Georgetown University Energy Prize, that was really focused on energy efficiency, so it allowed us to, really, to focus on that and promote energy efficiency through that effort.

And then also with our kind of spreading energy throughout, you know, we really try to focus on energy efficiency first. It's the broadest, so to speak, even though some of the other energy elements get a little bit more attention or get a lot of questions, but we really try to provide energy efficiency information, energy efficiency trainings to our

various city staff and really, you know, set them up to promote and to talk about energy efficiency in an effective way.

MS. LOWE: Yeah. The work that we've been doing with our members, really, we used energy efficiency as like the gateway drug. You know, we talked about energy efficiency and talked about how you're going to reduce those dollars. You know, hopefully, then that means you're saving, you know, manhours, which also translates to dollars. And then, you know, as we start talking in other terms, like greenhouse gas emissions and climate planning and those kinds of things, it was a very easy next step to stay, oh, well, you're doing this, just throw it in. And now, look, you've got it all together.

And so that was -- the dollars are inspirational to most. And energy efficiency translates nicely.

MS. WERNER: Yeah. I think the fun thing for having a Climate Action Plan in the city is that it is citywide, it's not just municipal. And so we get -- you know, the municipal part of the energy efficiency savings that we see as a city, obviously, exact same incentive, bills

drop, yay. But we also get to use the programs we work on in the municipal level as examples for engagement in the community because our targets are citywide, they're not just for city operations. And so we've actually seen more efficiency gains in our residential targets, at least in the last year, than we did in our municipal targets, some of that being we got to hit some of the lower-hanging fruit a little earlier on the municipal side.

But it also helps when you see the efficiency and gains in the community and you get to do that kind of -- if you're doing that kind of community engagement well it's you're using own numbers, you're using your own example, and then you're allowing the private sector to take it and run with it and so you see those gains, not just in one specific sector.

MR. SAMUELSON: Thank you.

The first follow-up question is: How do they benefit low-income and/or disadvantaged communities through energy efficiency or by other means?

MS. WERNER: I'll take that one.

So we focus a lot. We have an equity

component to our cap. And so we focus a lot of on leveraging various different federal- and state-level programs to make sure that the outreach we're doing in our communities of concern is front and center and that we can expand it and build on it. So we've, at this point, spent several hundred thousand -- and I'm sorry I don't have the number off the top of my head -- using things like community development block grants specifically focused on efficiency programs and engagement in the community, resiliency programs in the community, things like that. So it's incredibly important to us.

And again, going back to the Streetlights Program, we focused on that and have focused our outreach on that specifically in our communities of concern first, and we have other programs in the city that are focused on, again, putting those communities on the front of the line of how we engage so that the opportunities here are actually being leveraged and the savings that you get from efficiency are being leveraged most and first by those who can most use it.

MR. DOWNS: So, you know, like I said, we really do focus on energy efficiency. And so

anytime we're talking about energy efficiency and lowering bills, that can benefit some of our disadvantaged communities. But more directly, I would say, you know, this is where we get to leverage an aspect of local government which is we are engaging with a lot of disadvantaged communities' members on a non-energy related aspect. They might be coming to our libraries to look at resources. They might be taking advantage of our recreation centers or going to our housing programs, you know, through our Housing Department. They also manage multifamily housing with energy efficiency standards and sustainable goals in there.

So there's a lot that we're doing directly. And through that, you know, as we encourage energy efficiency to be kind of a lens that we look through at city operations, you know, that's where I think you have the biggest opportunity to support energy or support disadvantaged community members.

Although one thing I will kind of call out or mention is some of the challenges we've had with drawing borders on our community. One example that we have is we participated in a

program to facilitate electric vehicles. We have our City Hall on one corner of an intersection, our Police Department on the other corner of that intersection. One corner was in a disadvantaged community, the other was not. You know, does that make sense from a common sense operational perspective? No. And then, you know, even worse, it was to support electric vehicles. So, you know, the electric vehicles were driving around our community. There was almost no operational difference between the two locations but because of that border, one got a service and one didn't.

And, you know, for us we were able to overcome that. But I think it does, you know, remind us that we have community members throughout our region that we really need to be focusing on -- or community, I mean.

MS. LOWE: And because we're working, SANDAG is working with so many jurisdictions, it provides a nice opportunity to kind of address some of the different challenges among the different jurisdictions. And so to the extent that there are programs and opportunities that we can help bring to a jurisdiction based on the

needs of their constituents, that is one of the things that we will do.

We work closely with SDG&E, for example, to bring in some of the programs that they have available and help identify programs to the CEC or otherwise to really help bring the resources to the community. Whether it's us doing that directly or whether it's us doing that by way of the jurisdiction, that is how we are trying to help provide the resources that are needed.

MR. SAMUELSON: Thank you.

All right, the next follow-up questions is: How do they address the needs or concerns of the most impacted by environmental hazards, such as air pollution?

MR. DOWNS: I'll kind of -- mine will be short here.

I think most directly it's through the Housing Department programs that I mentioned and through setting housing standards for indoor air quality, sustainability products and sustainability metrics that should be met in the projects that we're funding, in the singe-family homes we're retrofitting or in the multifamily homes that we're working with partners to create

in our community, just making sure that there's that high standard. And looking at the resident health is very important for us in that sphere.

MS. LOWE: Because we're looking at municipal facilities, many of those municipal facilities serve as things like cool zones in the summer and are places, are safe places to go, like libraries and the like. And so ensuring that through the analysis and audits and the implementation of various projects, ensuring that air quality and just overall comfort and health are considerations or co-benefits to those efforts are just a nice, to use Cory's word, kind of a common sense thing.

And then, you know, acknowledging, though, that also something that was mentioned on the previous panel is that these co-benefits don't necessarily fall in line with how, you know, these measures are calculated, whether or not that's, you know, attributable to a local utility program or kind of a bigger, you know, challenge that's being faced at the PUC generally. But that seems to be where there's an opportunity to capture those benefits and attribute them to some of these measures that are

taking place. And part of kind of moving the needle and pushing those measures into action is articulating those other benefits.

And so those are some of the things that we try to leverage both sides of, you know, a value proposition, not just by dollars but also kind of through the public health component.

MS. WERNER: Yeah. And I would add, the thing I really enjoy about our region and the work that we do here is that we really do take a very regional approach to a lot of these challenges. Obviously, when you get into kind of specific policies and regulations, you're within a municipality. But secondary effects, and especially environmental effects, can also be, you know, sourced in one jurisdiction. I mean, you know, Chula Vista, San Diego, we're two of five cities on the port, so you have port operations that have an environmental impact. But the environmental impact from a residential standpoint is one of our areas. But then you have a very good working relationship with the port.

So there's no -- I think in general, our region is really good at not finger pointing to,

well, this is a problem but it's their fault. Like we work to solve the problem for all of our residents, wherever the source of or wherever the action needs to be taken to have the most benefit for both, whether it's businesses or residents, in that region and in that zone. And that, along with just general co-benefits, also then allows us to leverage, you know, operational efficiencies from a government perspective so that we all -- it's a win across multiple agencies.

MR. SAMUELSON: All right. Thank you.

Okay, the last follow-up question is: What long-term energy efficiency goals are you hoping to achieve?

MS. WERNER: I'll just say at 2035 our targets are, so I hit the 2021 -- the 2035 target is a 25 percent reduction from 2010 baseline for municipal energy greenhouse gas emissions and 50 percent reduction in residential. So those are the two big ones, at least top of the list.

MR. DOWNS: Yeah. So we kind of bypassed our municipal goal a while ago. And as we reevaluate it, I'm definitely encouraging us to set a goal for carbon neutrality. I think it's

time where we can start looking at the end, kind of the end of the tunnel. We'll have to see if I can bring all of my other colleagues along on that ambitious goal.

But from our community side, it's not a goal but we had a performance metric in the Climate Action Plan looking to, by 2035, retrofit 20 percent of our multifamily and single-family with a 50 percent reduction.

So I think there's a lot of opportunity but, you know, we'll be kind of working to put the pieces in place to get to those goals.

MS. LOWE: And not our facilities, so cognizant of that.

Instead of putting a percent reduction or some sort of really great, you know, goal on the jurisdictions themselves, but really, I think, you know, thinking more holistically about processes and things and just, you know, thinking about how best to continue to integrate, to better integrate, to make more permanent energy efficiency as part of the planning and capital improvement process so it's not a thing anymore, it's just -- it's embedded and it's just how we do business. And so I think in doing that, we

will get you.

MR. SAMUELSON: All right. Thank you.

Question number three: Do you have any local ordinances in place, such as CALGreen Reach Codes or a local benchmarking program? If so, how are they helping you reach your energy efficiency goals?

MR. DOWNS: Yeah. I can start.

We have a pretty modest Reach Code right now in place for commercial outdoor LED lighting. It was one of the areas where, as we were looking at opportunities, that they're really -- I mean, some of the cost effectiveness was infinity, I think, because the new equipment cost less than the old equipment to adopt. So it was relatively easy politically to take this through our city leadership.

But I think it still does reiterate to our city staff who are planning and doing plan checking, as well as city developers, that, you know, we do want you to stretch for energy efficiency and make sure, this I'd say, is just make sure you're not leaving any energy efficiency low-hanging fruit on the table.

MS. WERNER: So we, two months ago, two

months ago now, passed an ordinance that centralizes San Diego -- the City of San Diego's Commercial Benchmarking Program that is CEC level. So that data is now being captured by the city first. The city will then transfer it to CEC. And that ordinance then allows us to lean in and expand who has to report a little bit faster than the state level requirements, understandably. That's what's fun about being at the municipal level.

So that first reporting is June 1. That's the same standard as CEC, so commercial buildings with 50,000 square feet footprints. That then expands to both more commercial properties in the coming years, as well as multifamily. So who has to benchmark and what we can then start doing from a city perspective in terms of requirements for efficiency forward, we then have the data to be able to inform decision makers to do that.

In terms of how it helps you hit efficiency goals, if you don't measure it, you can't manage it. And so, again, because we want to see this citywide and we, as a city, really like leaning in on things like that, so taking a

program that has been developed and just seeing where we can accelerate it within our scope.

MS. LOWE: One of the things that we have been able to do in conjunction with the energy efficiency work and the Energy Management Plans with our member agencies is we've added in a Climate Action Plan component. And so helping those jurisdictions who don't have a Climate Action Plan or are wanting to update their Climate Action Plan, we've been able to start providing those services.

And really, that has been one way to really take this, take energy efficiency, to the next level in the sense that we've got now some of these adopted Climate Action Plans which, as you've heard from both the City of San Diego and the City of Chula Vista, really help kind of solidify the reason behind or the purpose behind doing some of the work that folks are doing.

And so there have been benchmarking ordinances, you know, discussed and talked about as far as how do we integrate that into the climate planning process and how do we measure that and what does that do? Does it really screen out gas emissions reductions?

So really being able to take the energy efficiency and wrap into an even bigger policy document, like what's been discussed, has really been a nice opportunity to look at facilities, but also look at the community side of things and, again, benchmarking.

The other thing that we're doing through the Roadmap Program is fracking all of the work that's being done by the cities that are participating. And so we've got a, quote unquote, "tracking too" -- I probably should come up with a better name for that -- that's capturing the work, that's capturing projects and opportunities, and then calculating what the savings are. If there's a utility rebate or incentive, what would that look like to the overall value proposition of a project?

And then also quantifying it as it relates to greenhouse gas emissions reduction. So really giving jurisdictions the gamut as far as opportunities to kind of message what it is that the projects are but also kind of caring for some opportunity to move forward on some of these new types of things.

MR. SAMUELSON: Thank you.

Question number four: What advice would you give to local governments seeking to do more related to energy efficiency?

MR. DOWNS: Sure. I can start.

MS. WERNER: Just in California or --

MR. DOWNS: Yeah.

MS. WERNER: I would say one of the challenges that is true in any, really, in any government, straight up, is finding funding and structuring that funding in a way that both, you know, get political backing for it, and understanding that there are strings on different types of money that municipalities can use.

The great thing about energy efficiency is it's the easiest thing to structure as an investment if you can get the right people either on staff or in your elected official's office to understand it and think of it like an investment. And that's different from how governments budget. Budgets are against cost. And so that -- it's not that hard a framework shift but it is a shift.

And so if you think of efficiency as a long-term project that has an upfront cost with return, and that's sometimes, depending on the

type of project, politically hard sometimes; it's really easy, depending on your audience. But that's your first step in terms of if you're trying to worry -- if you're worried about where am I going to find the money for any kind of efficiency project and you're not taking account of either the cost of doing nothing, which is a huge cost, period, but also the savings you get long term and being able to structure that as one story, that's your first low-hanging win.

MS. LOWE: I completely agree. And I know I mentioned this before, but integrating energy efficiency into the process, whatever the process is, so that it is part of just the general thinking. Yes, there may be upfront costs as far as dollars and cents but starting to look at maintenance and just the overall operational effectiveness and what that means, you know, longer term is critical.

I mean, instead of sending somebody out looking at lights to see, okay, well, there are some out over there and there are some out over there, let's change those out. And then three weeks later the same person is out there looking physically again about which -- there are better

ways to do this.

And so really integrating energy efficiency and other types of things into the process, I think, is really going to streamline and make more cost effective, also, these elements. But then, you know, thinking about being more creative and pushing the envelope a little bit.

And doing those things on the front end will open up funding opportunities that, again, are always so challenging for local governments. Really thinking about these bits and pieces more holistically will offer, possibly, a unique funding -- project for a funder. And those are the kinds of things that really do need to pick our heads up, get out of our silos, work together, as I think that we all do very nicely, and think about these things more creatively to really leverage the opportunities out there.

MR. DOWNS: And then, you know, I'll just add kind of, as I mentioned earlier, especially where the city started. You know, look at municipal opportunities first; that's where you have most control, most financial interest. And it can really bring along some city leaders to

understand some of the benefits of energy efficiency which can then help build support for efforts that look more far-reaching into the community.

And then the other one that I would kind of add is a little bit more hard for local jurisdictions but, you know, maintaining flexibility and being open to new opportunities. I think there's a number of programs where, you know, they kind of came along and we were looking at them, should we do them, should we not do them? Like Georgetown University Energy Prize is a great example. But being open to some of these opportunities can be really helpful and, you know, help you learn from others that you participate with.

And one thing I would say that is more of the challenging part is it's not always realistic or opportune to rely on grant funding or kind of one-time funding opportunities for city staff and programming. Yes, it's very important to leverage those. But often times, if there's not kind of a city staff that's funded with more stable funding or at least someone who's kind of been tapped into, say, this little corner, you

know, we'd like you to be familiar with this so we can take advantage of these things and opportunities that come at us.

Because, you know, sometimes, you know, you need to kind of go 20 percent of the way before you can take advantage of someone offering 80 percent opportunity. And, you know, that's something that I know a lot of local jurisdictions struggle with. But if possible, I think that would greatly help jurisdictions take advantage of opportunities that others, like the state and other nonprofits are creating.

MS. WERNER: I would also throw in, from a full jurisdictional level, do not underestimate the power of your permitting process.

MR. SAMUELSON: Thank you.

Question number five: What have been your main challenges in rolling out those initiatives and how do these challenges differ between building sectors?

MR. DOWNS: Oh, god. So, you know, challenges, there's always challenges. Some of the ones that I think are maybe a little bit more unique or time sensitive, the housing crisis has been a challenge for us looking at permitting.

And one of the leverage levers that we try to go to is we have permitting authority: Can we require homes to be more energy efficient?

And, you know, we've adopted Reach Codes in the past and, like I've said, we've adopted the relatively modest Reach Code that we have now. But as we look at more kind of larger Reach Codes that have maybe a little bit higher upfront costs for the developers building homes in our community, that's a very politically -- there's a lot of kind of political weight behind some of those concerns over cost, the cost of ownership of a home. And even if the retrofit that we're talking about is cost effective and will help bring down the operational costs of the home, it can still be a challenge to implement that.

And, you know, I don't know if there's any solutions to that, necessarily, other than, you know, as we address the housing crisis, that will also help us address more energy and incorporate more energy efficiency into that.

But the other kind of component of this that I'll mention isn't necessarily the challenge that we've had in rolling out initiatives but the challenges in maintaining initiatives. Often

times we can kind of pull the staff together and put some really great programs in place. But three years down the road, when maybe a staff has met or a grant ran out, it's much more challenging to kind of maintain those programs.

And, you know, one that we're looking -- or evaluating right now, some of the programs that I mentioned, like our library, recreation, or business license programs, are funded through our Local Government Partnership which is set to go away at the end of next year. And so we're really looking at how do we manage that process.

And I think there's going to be some really great opportunities for new programming to replace that. But some of that uncertainty is a challenge and how do we best effectively communicate that to other city leaders who might not be as involved in the regulatory process as we are? And that's still a challenge that we're trying to work through.

MS. LOWE: I mean, I think we, SANDAG in particular, works, again, because we're working with our municipal -- with municipal facilities with our member agencies. You know, our vantage point is slightly narrower than those working

with broader jurisdictions, both municipal and the community.

But one of the things I think that we've heard before is money; money, capacity, and just trying to keep up with the day-to-day operations of just running a city. And then, you know, taking the time out of, you know, the normalcy of what folks do on the day-to-day and evaluating some new or different opportunities and figuring out how to do that, where to do that, and what will that cost us, and is there a tradeoff? And the idea is that there shouldn't be.

But, you know, sometimes there's kind of a process in helping to inform those folks working in that space and then those, you know, decision makers who are, at the end of the day, deciding on whether or not we're going to move forward with a project or not.

Some of the other things, too, that are challenging have to do with just the changes in available program opportunities and kind of evaluating opportunities based on programs. And then, you know, we know government doesn't necessarily move quickly. And so when we get to a decision point and we're ready to kind of go

forward, all of a sudden, the programs not there anymore. And so the value proposition may not be there either.

And so how do you keep the momentum going, whether or not you're going to get the -- you know, maybe it's as little, I say that loosely, but as little as $10,000, you know, there's a savings there, but that could be the difference between moving forward and not.

And so those are some of the things that, you know, local governments are faced with in trying to just keep the initiatives moving forward, keep the projects going, and keep the excitement for these opportunities moving forward.

MS. WERNER: Yeah. This is going to be similar to what's been said. I think there's two -- within any municipality, again, within any government, you are spending taxpayer money. Which means the rules of transparency and contracting and all of those things, which are total valid to be in place, but they don't move as fast as the private sector. And the rules around competition make -- just make things move slower and that can be a challenge, especially

when you're trying to be innovative in this space.

When we're moving from low-hanging fruit to deep retrofit and deep efficiency actions, that's also just new for city processes. And so you've got to -- you're kind of building the plane in the air while keeping, you know, as open and transparent and competitive process as you possibly can.

So how you do that, how you do that effectively, how you do that effectively partnering with the private sector who are bringing these solutions to you, those are challenges.

The other is from a community engagement perspective. And some of this is kind of the nature of humans and some of it is the culture of governments is we are designed to provide services to all of our residents and businesses, but for the most part that is a you come to us for a service and we've going to provide it to you. Community engagement is always, I think, underestimated in terms of the amount of labor intensity that goes into outreach and the number

of touches you have to have where the initiating action is actually the city for us to do that.

And, you know, it's the difference of anybody who's ever been to a community planning meeting and the number of people who are at that meeting as opposed to the number of people who are actually in that community is a very, very, very big delta.

And so, you know, the assumptions on how many touches you're going to get in the community from a central planning perspective as opposed to how much time and dedication you have to do with one-on-one and individual intense outreach to get these programs in place and leveraged and really doing -- having the effect that you want to have is not something that we can underestimate.

MR. SAMUELSON: All right. Thank you.

We're down to the sixth and final question.

What can the State of California, and the Energy Commission in particular, do to support you in that work?

MR. DOWNS: Yeah. This I can talk about for a while.

MS. WERNER: How much time we got?

MR. DOWNS: But, you know, first and foremost, I think, you know, keep doing what you're doing. I think, you know, doing these, like spreading out a lot of the planning process, coming to cities, regions like this, I think is a really great step. There's a lot of tools that we're currently using and plan to use that, you know, we're going to be relying on as we roll out our own policies.

But, you know, as you mentioned, stable and flexible funding is always really important. And taking advantage of the opportunities that you have working with local jurisdictions. Often times, you know, local jurisdictions will be the storefront of local -- or of government, of the state government, of the CEC. They might not know CEC but they know their local jurisdiction. They might go to it for all the reasons that we've talked about.

And so, you know, providing a way for local jurisdictions to leverage those engagements that they have naturally with their community members I think is, really, kind of an untapped resource right now and it will be really important going forward.

And then two of the other kind of, you know, just bigger ticket or bigger items that I think the state can play a role in, one is, again, the borders or, you know, lines on a map. Another line that can be a little bit frustrating for us sometimes are the climate zones. We're currently in climate zone -- we have two Climate Zone 7 with a little wedge of Climate Zone 10 in our community.

And, you know, as we talk to our residents in those communities, you know, they're coastal but they've lived there for 50 years and last year was the first year they put in an air conditioner. So making sure that, you know, climate zones and the climate information that we base all of our planning decisions on are reflecting the change in climate of those communities, I think is a really important one.

And then, you know, addressing, really, the benchmarking policy I think will be a really important program that the CEC has a lot of control and space to implement. And supporting local jurisdictions that might not be ready to take over the reporting responsibility but might want to do a little bit more than the bare

minimum and what resources can be provided to local jurisdictions to help facilitate those actions, I think, will be really important.

MS. WERNER: I have two; one is slightly sarcastic. I'll start with that one.

I think it's interesting, California is very much in the lead and really good at a lot of what it does in this space compared to other states. That doesn't mean we're always really good at doing it.

And so I think things like this are really good because it's constant reassessment and improvement of programs that are already in place. We don't always need to innovate a new line of funding or innovate, you know, a new program. It's going back and improving what we've got and advancing it to take account of things like new technology in the marketplace or, you know, new needs. Okay, once we've benchmarked, then what's the next step?

The other thing that I would find really useful from a state-level perspective, because it's so easy to manipulate, is actually having a way to calculate or establish a standard of calculation of the cost of doing nothing. You

can find a consultant's report for any answer you want on the cost of doing nothing versus some specific program.

But there is, I think, a gap in a standardized baseline of how we calculate. We can baseline where we were. But what that cost of doing nothing looks like from a financing perspective, it's a hard thing to do. There's a lot of variables and there's a lot of unknowns which is why no local jurisdiction is necessarily going to take that on. It's too -- your end result has too much wobble for kind of local budget decision making, project-level decision making stuff. It would be great to have that from that state resource.

MS. LOWE: I think some of what I'm going to say is not going to be new or different or astonishing. But, you know, taking a look at the whole picture, you know, there's really this holistic opportunity to approach all of this together. It's more cost effective. It's more streamlined. There's just so much there that presents value.

But when one is looking at funding, for example, or one is looking at a code or a

regulation or a this or a that, I mean, all of a sudden you're looking at the CEC, you're looking at the CPUC, you're looking at ARB, you're looking at OPR or Strategic Growth Council, or whatever, whatever, whatever. And at the end of the day, you have totally burnt yourself out and you have no idea where you started. And so that's when you end up in these kind of more narrow buckets.

And really if, you know, we started looking at energy efficiency as part of climate planning, as part of adaptation planning, and we talk about that, but really, this is a broader issue than just energy efficiency. We're talking about resiliency. Energy efficiency is a critical component to ensuring that grid has the capacity it needs to do what it needs to do, whether it's, you know, charging electric vehicles to get folks out of where they are to ensure they will not suffer the consequences of whatever, you know, natural disaster is coming their way, or, you know, whether it's ensuring those folks, those populations, those communities of concern are able to cool down enough to ensure that, you know, their own health is okay.

And so I think really, you know, defining energy efficiency within that climate planning and adaptation base is really going to help move the whole further.

And then lastly, and something that I think Lindsey had said, the CEC and others have said since, and this is, Scott Anders [sic], this is for you, but truly, you know, that evaluation metric or the, you know, what is that level playing field? And is it carbon? Is that what we're looking at? Because maybe that then is what we should be looking at when we're looking at the CEC, whatever it is, when we're looking at the CPUC, whatever it is. You know, instead of having a TRC and a this and a that, let's level the playing field. You know, you've got to know how to compare apples to apples and you can't do that when we're working in different frameworks.

And so that's, I think, probably one of the biggest, most important things that, at the state level, we can be doing, outside of giving more money, is speaking the same language.

MR. SAMUELSON: All right. Thank you.

I did want to take the time to see if there is anyone in the audience who have any

questions for the panel?

MS. YARMY: Hi there. My name is Renee Yarmy. I'm with the Port of San Diego, so I know these panelists very well. I just wanted to reemphasize a point for the California Energy Commission and the benefit of their staff, and anyone listening from other state agencies. And although it's loosely referred to as the Local Government Partnership Program, I just wanted to explain it a bit more and give context because it has a lot of value to what these panelists were presenting.

The Local Government Partnership Program, under the auspices of the California Public Utilities Commission, is going away. And that funds, for example, annually the education and staff training and other resources that are these intangible benefits that extend the life of new Title 24 regulations and their implementation across our agencies.

So as this business planning process is underway and the funding is eliminated after 2020 for our plans, and it's already disappearing across other local government agencies already, so they're losing staff and they're losing this

continued education of contractors and their own engineering departments and public works, you know, as we see that go away it's going to be more and more difficult for us to meet the state's goals. And we need to find other supplements of funding. And grants are always kind of beyond, you know, what are you doing beyond the regulations, not meeting the regulation. And as a port, we run into this in other unique areas with shore power regulations and medium- and heavy-duty transit moving towards electrification.

But just speaking at a sort of baseline level for our government agencies, we need all of the funding support we can get for things that don't meet the cost effectiveness ratios that are currently being implemented through this new business planning process that the CPUC is pursuing.

And so I just wanted to reemphasize that because it was touched on from different angles but I don't think anyone kind of just laid it all out as an umbrella understanding of what this will do and the detriment that it will do to our staff and the ability for us to continually

educate our colleagues and stay ahead of the code, you know? And, you know, I have an architectural background and still I'm chasing after it and crawling, you know, towards the new 2019 revisions that were just adopted.

So I just wanted to reemphasize, for the Commission -- or for the CEC to really consider when you look at what's happening with the CPUC and ways in which you can support us in San Diego, but really across the state.

Thank you.

MR. SAMUELSON: Thank you.

MR. HANACEK: Hello. John Hanacek with a little tiny startup called Can Cover it. And my question is directly related to how can our universes merge a little better here? Because how do we create a better interface between government statewide and sort of very bureaucratic -- you're very complicated, you have lots of metrics and standards and measurements -- and us plucky startup people who have a lot of solutions, maybe, to your troubles but we are invisible to you and you're incomprehensible to us.

So I say this because the only reason

that I can even -- that more motion has happened for my startup, Can Cover It, within the last year, because we got it as part of SEEN (phonetic), or formally SD Rain (phonetic). Within that program we're, again, we're invisible to you and you're incomprehensible to us.

So I think our concern in the startup community is that -- and we're talking about startups. We're not talking about a large company's new innovation wing. They already have all the certs and everything to talk to you.

I think we've got a serious opportunity to network more strongly between like we're talking garage-level ideas and what you need so that you don't get entrenched with players selling you bad technology and that we, startups, get the right opportunity to showcase our potentially extremely disruptive innovations that would change your calculus entirely and let you do things that you thought were going to be X times more expensive than really, oh, hey, we've got this module that, you know, we invented last Thursday, here you go.

So how do we make a better interface and something that's going to let us talk to each

other?

MS. WERNER: You be the optimist. I'll be the pessimist.

MR. DOWNS: We'll see.

You know, I'll say, you're doing the right thing. You're being persistent because I've -- you know, we've talked before. And local jurisdictions, it's really easy for us to get caught up with whatever our core aspect is. But persistence is definitely something that I think most people have to have if they work with a local jurisdiction.

But then the other component of that is and, you know, the thing that I mentioned when what would I do to encourage more energy efficiency, it's, you know, say yes to opportunities. When startups come to us with ideas that they'd like to share with our community members, you know, I think for local jurisdictions there can be a little bit of a, you know, whoa, whoa, whoa, did that go through this procurement path and does that get this approval and what's your insurance, you know? And before we -- yes, we still have to go through those things and we have to check the boxes and make

sure that we're, you know, following all the codes that we should follow, but before we put up those barriers let's say yes to hearing more and learning about what the ideas are.

And, you know, something that I think the City of Chula Vista has done a lot of is, you know, maybe that might not work for like a citywide rollout program, but can we pilot it? We've done a number of kind of pilot projects with new partners that help us understand the technology more. And they don't always lead to larger programs but they lead to better, just better knowledge for us and for the partner that we're working with.

So, you know, it's not necessarily the easy answer but you're doing the right thing with speaking to local jurisdictions and, you know, encourage -- I'll encourage local jurisdictions to speak back openly.

MS. WERNER: So I'm going to use an -- it was mentioned, I used to work for the Department of Defense. And that was always really entertaining when I would go to like business roundtables or anything like that because anybody who saw DOE on my business card immediately saw

dollar signs and would come and get pitched. My specific job was working in-country in Afghanistan. So my first question back to business was: Can I blow it up with C-4? And they'd laugh because they'd think I was kidding and I wasn't.

So I think there's -- some of the realities of working with government is recognizing that. And I fully understand that the process is onerous. So it is hard for startups to have government as their first client source. It is extremely hard on your revenue line. It is very, very hard on your rate of return if you're looking at that as an investment.

To Cory's point, there is absolutely opportunities for piloting. San Diego has something called Startup and Residents, which is a program we actually -- we have brought startups in to try to solve inside problems so that we getting -- taking advantage of innovative companies that are looking at problems very differently than how we structurally do.

But I also have to give fair warning, the reason I joked I'll give the cynical answer, is

the word disruption is not a positive thing when you're talking to government. Innovation, yes, we love that term. And this is literally just a terminology and vocabulary thing. But in all honesty, we love innovative solutions. Disruption is a risk. Risk analysis, when you get into government services, people see expense with no committed return. That's a much harder lift.

So I think one of the things that -- the way that you start sowing the seeds for engagement with government at any level, municipal included, is start -- think of it as an educational sale and understanding that -- understand how they see the problem and understand where you need them -- how you need them to see the problem in order to understand why you're a solution for it. It can't be something where I can solve -- you know, you have this problem and I have the solution for it. You have to convince me that I have that problem to begin with. And if that doesn't match kind of how the structural process of government works, you're talking to a brick wall. And it's not because we don't want startups and companies to

grow in our areas, it's just you're using a different vocabulary.

And so you've got to introduce your vocabulary to the city. And just recognize that the process for revenue recognition and investment is going to be longer. And so when you're looking at your financial profile and you're talking to potential investors and things like that, the public sector is a hard first sales target, it doesn't matter the level, and plan accordingly.

MS. LOWE: I'm going to actually be the optimist here, which doesn't happen often for many people who know me. But in this regard I think, you know, at least in the, you know, number of years that I've been at SANDAG, I have sat down with all sorts of folks, startups, they think they're startups and they're not, to your point, and the like. And technology is scary and different and new and scary.

But also right now, when you look at this region as a whole, there are so many different types of opportunities for startups. There are forums and there are programs and there are a lot of mechanisms now that bring folks to the table.

And I personally, and this, I'm a little removed from some of this in my role, but I think that there's a really -- that this region is making space for that innovation and making opportunities to come to the table to kind of expose what it is your doing to those of us sitting at this table.

Personally, I'm happy to hear, and I do, I'm happy to hear what folks are doing because it helps connect me with what's happening in the region and it helps me understand what folks are doing, just kind of from the industry perspective.

I know that I met with someone, probably like six to eight months ago now, maybe it was longer, but we weren't where they needed to be but we had some opportunities with some of the universities and another organization in the region. We kind of said, here, let me use my -- let's use our, you know, connections and do that.

So I think that there's some -- there are some opportunities. We are using taxpayer dollars, ratepayer dollars, et cetera, and we do have processes in place to ensure that those dollars are spent appropriately. That doesn't

mean that spending them on your product wouldn't be appropriate. It's just the wonky nature with which we work. But we do want to hear what's happening in the region, what's available, and how we can help connect those folks to other opportunities.

MR. HANACEK: Great. Thanks. Maybe one last thing is you -- maybe you all can also feel free to like tell the world, if only there was this widget that could do this or that; right? So there's also that other side of it of like we have to pitch all day, all the time, 24 hours a day. And also there's that, like X Prize has been successful at this, right, is let's try to make needs meet. You know, we are doing -- X-Y-Z startups are doing certain things. If you all have like, in your own discussions, some design thinking of yourself, like I really wish this thing existed, it probably does, but it's so hard to get that audience, even to begin with. It's getting a lot easier.

But I will say, also, I think it would be really interesting to explore kind of next-gen interface where it's like, hey, we want this sort of thing to exist; can any of you in the

community do that? And that creates an interface.

So, you know, things of that nature and kind of like -- and, you know, and I'm learning how to talk right to you all. And then I think, also, I want, I'm hoping that large entities will also feel like you call can put on your nimble designer hats and we can meet in the middle too; right?

So I just want to say that, as well, because there are people who are technology first and they're very inventive and they want to help you. So just ask, too, like you never know. I mean, even my company could be like, oh, we didn't think about that but it's adjacent to this and we'll just go ahead and make that for you because you are a potential customer. Because if you want it, someone else probably wants it.

So even if takes us a long time to get to you, well, that means -- you know, so pilot proofs are a big deal for us in the private sector because if we get one project with you, even it takes us 100 years to actually work with you, that one pilot means that we can talk to other people.

So it's all good and I'm really appreciative of how much change has happened. I'm an optimist, obviously, that's why I'm here. But, you know, I want to also kind of open that up and see if we can create a stronger bridge connection.

Thanks.

MR. SAMUELSON: Okay. Great.

COMMISSIONER MCALLISTER: So I'm definitely conscious of the time. I could not resist. I've been biting my tongue all day. And anybody who knows me says, gosh, what the heck, where is he? Yeah. Yeah.

So I want to just thank you all for your thoughtfulness and really just the innovation that you're bringing into your jurisdictions. You know, I have some threads in the fabric here in San Diego. And it's really, I have to say, it's just so marvelous to see the baton being carried forward, you know, from the Tom Blairs and the Linda Pratts and, you know, the Brenda Reeds and Michael Meachams and, you know, all the great things that's happened in the SANDAG all along.

So I have a couple of points that have

come up that I just want to clarify just for folks' benefit.

So the last discussion, it's a great discussion. And I will just point out that the California Energy Commission has, as part of its EPIC Program, CalCEF, the California Clean Energy Fund, and within that, CalSEED which really focuses on the type of companies that were just discussed.

And so that's a really great opportunity and, actually, does have a lot of flexibility. By the fact that it's two layers down away from state government, it's actually got quite a bit of flexibility. And the contracting is much more straightforward. And, you know, the dollars are not as small, actually, as you might expect from that, so they're significant.

And, Cory, before, you asked about the IECC. And I just wanted to talk a little bit about this.

So it's true that the energy piece of the IECC, or the International Energy Efficiency Code, is not applicable in California. So most other states actually use that but California does not. We have own Title 24 and so we take

bits of ASHRAE and we sort of compare notes but we don't actually adopt the IECC.

However, the IECC is super important. And it has been -- it has lagged because, in its sort of promotion of energy efficiency, just because it's been really under the radar and sort of vested interests have really owned the process. And the voting is a little bit Byzantine and there's all sorts of reasons why it's been under the radar.

And so I actually Chair the National Association of State Energy Officials right now. And so the other 50 states are really interested in this and there's just kind of a nationwide movement to say, you know, take the bull by the horns here and say, okay, we're going to -- all local jurisdictions, all government entities can vote, you know, and historically they have not. And so anybody who can marshal votes is the one who gets the vote in.

And so the residential piece is a great opportunity at this time. And so there's been quite a bit of organization around the country trying to mobilize governments at all levels to vote. So that's a really -- so anyway, I'm

encouraging you strongly to vote because I think even though it's not maybe day to day relevant here, it is a manifestation of California's leadership, not only at the state level but also at the local level.

And let's see, the last thing I wanted to say, and then I do have a question, is data has come up quite a bit. And we're doing a lot at the Energy Commission on data. And maybe it hasn't quite hit the public airwaves yet but policy -- you know, the benchmarking piece is one component of that, you know? Kudos to Doss Williams (phonetic) for AB 802 and all the local governments. And we're really, I think, at the cusp of something incredibly important to be able to characterize the building stock and, you know, move that maybe down in square footage over time when we see how successful it is, and look at other ways to get that data collected so that we can do better policy, so that we can advise the legislature so that you guys can make better decisions.

And then part of that is also what we're doing internally at the Energy Commission which, you know, obviously, isn't as public because it's

part of our forecasting kind of activities that are a little bit inside our baseball but they're very relevant for long-term policy. And as part of the emphasis on local government, we want to eventually get to a place where we can aggregate to appropriate levels and really make that portal very facile such that, you know, we're not sort of reinventing the wheel every time we ask for data from the utilities, for example.

And so I've been through all that stuff, you know, with all the hats I've worn before I entered state service and it's just an ongoing issue. And so I think the PUC is making some progress but we're sort of forcing the issue at the Energy Commission. And I think it's, you know, going to pay off here pretty handsomely in the next couple years.

So I do have a question. What can -- so I think -- you know, this laboratories of democracy is absolutely happening in the energy sphere. And I want to do everything I can to encourage that. And, obviously, you've all said resources are scarce.

How much -- is there -- are there good platforms for local jurisdictions to sort of

share and compare notes and then compare databases and processes and really just sort of learn from each other?

I mean, I really feel like you guys are leaders. And SANDAG kind of does a lot of that I think. But, you know, I feel like the sort of NPOs and COGs and, certainly, just sort of regions themselves across the state are kind of underappreciated. Certainly, at the state level, they're underappreciated. And I think that's where these problems are going to get solved. I mean, we're not going to do it from a state level. We're going to do it at the local level, every single project you guys touch?

So I guess I'm kind of, you know, wondering where -- if we did find some resources to inject into something, you know, if we convinced the legislature, say, to dedicate some resources to something to sort of, you know, inject some steroids into local government activity around clean energy and climate -- you know, you've got SB 375 hanging over like a big dark cloud -- what would that be?

MS. LOWE: Well, I mean, I think locally, and I think you probably know this also pretty

well, but, you know, we all like each other which has made the communication and the coordination among the jurisdictions here in the region very natural. And whether or not -- you know, we're not electeds so we're not dealing, you know, at that level, but we call each other all the time. We have established partnership with each other and collectively that pull funds to help move the needle regionally. And so I think, you know, that has been the premise for so much of the communication and the sharing and the resource leveraging and the like.

I mean, SANDAG is developing a data portal of sorts to help with climate planning and pulling together the data, bits and pieces of the data that go into kind of, you know, inventories and that kind of thing. Obviously, we have other data that I'm not involved with and you don't want me to be involved with.

But, you know, I mean, I agree, I think that there's a lot that can be done as far as leveraging what already gets done at that regional level. I think it would be helpful for someone like myself in that regional space to hear where that value ad would be to the locals

because that would then motivate or, you know, reinforce the next step or whatever it is we would be doing but also hearing kind of from the state as it relates to what do you need from a regional perspective and is it -- if it's collecting all the information, whatever that is, and using it as a conduit to get you what you need I think we need to kind of hear what that role would be.

And I don't think that we have a problem playing that in space historically.

MR. DOWNS: Yeah, I think SANDAG's a great avenue and, you know, definitely, you know, there's a lot of opportunity. I think with their -- I don't want to misbrand it but with the recap of effort and program that they have been running, as well as just the programs that they, you know, the municipal planning programs that they run already, I think there's opportunity there and some good foundations to be led there for sure.

One other that I'll mention is a little bit of a collaborative effort that we're leaped on here in the region with the San Diego climate collaborative. And is an opportunity for local

jurisdictions as well as other stakeholders in the community to get together to look at regional climate planning efforts. And so, you know, as, you know, if they were able to kind of build some of their capacity and provide, you know, more maybe more raw energy or whatnot, you know, I think that's a good opportunity.

And then the last thing, you know, it's kind of all of the above which isn't very practical. But, you know, where -- where jurisdictions do have some size or capacity where they might be able to carve out part of the staff time or whatnot, I do think it is important to have staff at these individual jurisdictions so that they can, you know, be the energy efficiency staff person there and serve as the hub for the other staff or the various other, whether it be finance, recreation, planning, to kind of come to and ask, you know, those energy efficiency energy questions.

You know, it's definitely not something that every jurisdiction would be able to even address. But where you can have those opportunities, I think there's, you know, good opportunities to kind of be like the, you know,

the state's storefront for energy policy and that local jurisdiction.

MS. WERNER: I'm going to play my newbie hat here because -- but one of the things that -- one of the first things I noticed when I joined the city and started talking to my colleagues on the panel and our counterparts at other municipalities is part of the great thing of how our region court mates is we recognize natural divisions of labor in terms of natural divisions of knowledge and organization.

And so something like you mentioned data, you know, SANDAG transportation data, they govern us around AV but that is a space that they are required from a federal level. Like, they're way advanced in that space. Chula Vista is one of the proving grounds for then AV, et cetera. So we get to -- we get to poach their lessons learned and, you know, our, you know, will San Diego cutting down a path of CCA so now we're on the lead and engaging our municipal, you know, our brethren on how that's going to be structured from a reginal perspective. So.

And so Cory's point, I think there is -- there's also the recognition that who owns what

at every different jurisdictional level partially is interpreted by size but also kind of who -- who individually in that local government happened to take on that project and then got dubbed the, you know, IOT person or the, you know, the EV person or et cetera.

It would be interesting to have state guide -- assessment of kind of best practices on for -- especially for jurisdictions that are just trying to get into this. So we started with an office of sustainability, we now have a department of sustainability. And that scope is broadening because it's now embedded in almost all of our city operations. Different municipalities of different sizes are not going to necessarily do that. But where kind of the natural divisions of labor happened from a regional perspective because so much of this really is, you know, local -- local mandate on regional economy in California. And where -- how local governments development their organization to build this into their operations in the most effective way.

And they're going to be different depending on jurisdictional size, budget,

political interest, et cetera. But that actually is a space where I think the CEC and the state could be useful from kind of an outside perspective in terms of being able to capture not just a lessons learned from a project's perspective but from an organizational perspective. Where does resiliency live and how does it -- how does it manifest in different size jurisdiction. Things like that.

MR. SAMUELSON: Okay.

MS. BIRD: Can you hear me?

MR. SAMUELSON: Yeah.

MS. BIRD: It's probably time for us to move on. (Indiscernible.)

MR. SAMUELSON: Thank you.

MR. KENNEY: All right. So before we do get to our last panel, I wanted to get people a small break to get up and stretch. We've, you know, been running through since lunch. So let's take a five-minute break to just get up, get some water, and then we'll come back and take a look at our multifamily building sector and learn from our upcoming panelists, so please stay tuned.

[Off the record at 3:18 p.m.]

[On the record at 3:25 p.m.]

MS. RAXTER: Hello, everybody, my name is Ronnie Raxter. I am an energy commission specialist in the benchmarking and equity unit in the efficiency division of the California Energy Commission.

I'm pleased to monitor Panel 4, Capturing Deeper Savings for Multifamily Buildings. To explain how pertain energy savings and multifamily buildings are, according to the U.S. Census Bureau, nearly 60 percent of multifamily buildings in California were built before 1979, they're over 40 years old.

According to federal poverty guidelines, 33 percent of California households are classified as low income. And according to our barrier study, 47 percent of low-income Californians live in multifamily housing.

To quote Will Rogers: Even if you are on the right track, you will get run over if you just sit there.

Joining us to help us move forward while on the right track are Pete Armstrong from Wakeland. And Sochiata Vutthy from Community Housing Works.

Peter has two decades of experience in

the field of community development and affordable housing. As Walkeland's vice president of real estate development, he oversees all aspects of financing and construction of low income rental housing development. Prior to joining Wakeland, Mr. Armstrong worked for the San Diego Housing Commission, EAH Housing and the cities of Berkeley and San Diego. Mr. Armstrong received a Master of Planning degree from the University of Minnesota and a Bachelor of Arts from Pomona College.

Sochiata Vutthy is currently a senior asset manager Community Housing Works, CHW. Ms. Vutthy oversees the physical plans of 1,500 apartment homes in the organization, 3,700-unit portfolio and manages many rehabs across the portfolio. CHW strategy for portfolio management and minor rehab is to incorporate energy efficiency and sustainable measures as part of this portfolio upgrade. Ms. Vutthy has experience with the Energy Upgrade California, Multifamily Affordable Solar Housing, California Solar Initiative, and various state and regional weatherization program. Ms. Vutthy has over 15 years' experience in the real estate development

and operations and she holds a BA from San Diego State University in public administration and urban studies with an emphasis in city planning.

All right. So welcome. Thank you.

So to start this the first question is two parts. What best practices can you share for capturing energy efficiency in multifamily buildings? Are these common area upgrades or are you able to capture deeper upgrades in individual dwellings? So let's start with Peter.

MR. ARMSTRONG: Okay. I think the most important thing I realized in sort of my role at Lakeland -- and, you know, for context, you know, we're probably currently designing approximately 800 new multifamily units that'll get built hopefully the next say three years. We're also working on a couple of rehab projects that will probably total about 260 units in several sights in San Diego County.

So, you know, by matter of scale, we're not -- we're not huge owners or developers of property but I think our industry, I mean, Sochiata and I are both affordable housers and our industry is sort of on the leading edge of incorporating energy efficiency measures and

other programs that we've been talking about today into, you know, into real projects.

MS. RAXTER: And so start answering.

MR. ARMSTRONG: Yeah. So I think just sort of answer the question is that, you know, I think from my perspective, the best practice is really to try to put energy efficiency and, you know, I'm learning lots of new words from you guys. Probably, you know, in the last year, I would have never known what decarbonization meant or electrification, what that might have meant.

So I think putting energy efficiency and (indiscernible) decarbonization at the sort of the forefront of our activities, I would say, you know, we're really busy, we're doing 800 units and we've got a lot on our plates. And we've got other very important goals. So, you know, providing the most affordable housing units to people who are, you know, most desperately need of housing, you know, providing great services. You know, being able to operate these properties for, you know, 55 years and longer in most cases.

So I think really putting energy efficiency at the center of our work is really very important. You know, recently I started --

started challenging myself and my staff to say, you know, how can we just, you know, be completely 100 percent electric in our new project? I think the easy thing for us to do, sort of our playbook is to do, you know, gas boilers, solar hot water, you know, meet Title 24, maybe meet some of the other regulations that are in front of us. I think, you know, challenging ourselves is really an important best practice and probably the first, you know, the most important thing I would say.

MS. RAXTER: And Sochiata.

MS. VUTTHY: Well, I don't -- my answer is not going to vary too much from what Peter just shared because the reason why community housing works that leave you a lot of energy efficiency upgrades and sustainability, it's because we have made it -- made it a top priority for our organization and for our development in general.

So not only are our upgrades energy efficient -- or including corporate energy efficiency in them, but our organization itself, we -- whatever we can do to be more energy efficient within what we do internally within our

offices. And sustainability as well, it just -- it takes that -- the organization has to have that -- that mission is a value that we have. And so that helps with that. And the best practices that we've seen.

So speaking from a perspective of an active manager and an operator, an owner-operator, what we like to do is when there is -- there is a retrofit that's coming up, again, trying to see what energy efficiency program rebates are available so that we can incorporate that into our program and then also looking how that -- how we can sustain that in the long run because again, after we install it, we want to make sure that it continues to operate that same way. So we created energy pond for each property and in that energy pond we -- we include in there what are the upgrades that were installed in the -- in the property in the unit.

And we also talk about how to -- how the property should be maintained so that it stays sustainable, it stays we still have energy efficiency measures in the property. It has to maintain those energy efficient, the measures as well.

So getting everyone involved. So, again, organization, core organization, how we operate, and community housing where we have a third-party property management company. So we have to get them to buy in on what our culture is, what our values are so that it is, again, it can be implemented on the ground.

MS. RAXTER: Okay. So the second question is what changes could be made to capture more energy efficiency in multifamily dwellings? Are they programmatic, policy, resource related, or other? And so we'll start with Sochiata, you first.

MS. VUTTHY: So I've had a lot of different experiences with different types of energy and efficiency program from weatherization to more hold building energy upgrade retrofit.

So from thinking about it from kind of a low hanging fruit that to me, that's the weatherization program. Things like the ESA program through SDG&E, things like that. How can they be more efficient? So the -- (indiscernible) again, owner-operator, I like to keep my hands on understanding what's happening in all of my communities, especially when it

comes to changing out products and materials that I've already set a specification to.

So when it comes to -- and I'll speak specifically about the ESA program. As an example, it's that through that program, there's, you know, like SDG&E likes to make sure that everybody knows about the program and everyone who's eligible take advantage of the program. That's great. Except, for me, when I'm trying to take track of things because, you know, in two years, I'm putting together a capital ESA assessment and I'm going back and looking at the property and seeing that I need to repair and replace in common areas, what I need to repair and replace inside the unit.

Difficult for me to keep track of things is things are happening without me knowing. So stream lighting -- streamlining processes has been kind of my goal when I'm looking at programs which is one of the main questions I ask is, you know, how can I get the information -- how can I get the information of what you have installed into the units? How can we make this a community effort and not an individual effort? Meaning let's pawn this out. Let's pick a property,

let's qualify for this program which we believe has a high probability of residents qualifying for the program and let's get some communities together, let's have a resident meeting. Let's talk about it, let the residents know about the program and let them know what the processes are, what the steps are. Have the contractors there at the resident meeting so that they can sign up, so that they can talk directly to the contractor or to SPG&E, whomever it is, so that way we kind of get everyone at once, they can go and tell their neighbors, we can follow up.

So I like to do things methodically in a sense so that we can get more people involved, more people to know about it versus just the door knocking. So I think that if there is that approach -- that approach from kind of from the provider's side to understand what the owner-operators look for, I think that would be -- make things -- would make them more efficient.

MS. RAXTER: Thank you. And Peter.

MR. ARMSTRONG: Yeah, I think -- so, you know, affordable housing development, it's really about, you know, we're leveraging lots of state and local subsidies in order to subsidize the

construction and sometimes even the operation of our property.

And I would say that the resources that we get from the affordable housing sources that I would say are interested in energy but that's not their main focus. You know, that -- this is probably the amount of that funding that we get from, you know, people that wanting to house low-income folks.

You know, the amount of money we get from energy sources is probably this amount. And I would say that the, you know, so leaving in the energy policy, into the affordable housing program is really pretty important.

I would also say that it would really be nice to have programs that have long periods of time that don't sunset, you know, every year or every couple of years. That maybe give us certainty. You know, so like if you say to me, Peter, if you electrify your entire building, we're going to give you $100,000 subsidy, I'd say great. You know, because that would really make it (indiscernible) and it would really give me incentive to go beyond sort of business as usual.

And so, you know, our projects might, you

know, if we're lucky, I might be able to get a project design and into construction in 18 months. Sometimes it might take three years, sometimes it might take five years. And so as I'm planning and designing my project, these funding sources kind of come and go. And, you know, like I said, the amounts for energy are -- are not necessarily motivating my action. You know, so Sochiata and I are here because this is important to us. You know, we want to change the world, that's why we work for the organizations that we do. And so it's important. But we need sort of certainty and we need, you know, we also need the right incentives.

MS. RAXTER: Thank you. And as a clarifying question just for me because you're not the person to state that they would like to have a longer duration on some of these programs.

What is your definition of a longer duration? What does that time frame look like?

MR. ARMSTRONG: I mean --

MS. RAXTER: Could it be a (indiscernible).

MR. ARMSTRONG: Yeah, I mean, for me, you know, like a five or ten-year horizon.

MS. RAXTER: Thank you.

MS. VUTTHY: I'm trying to think of the programs that I've seen expired and most of them -- well, for instance, the ESA program, it's available, the energy upgrade is still available. Some of the smaller measures, for instance, low flow toilet replacement, I know that's water but at the same time water impacts energy as well so I consider that an energy efficiency.

MS. RAXTER: That one (indiscernible).

MS. VUTTHY: Right. Right. Right. So I mean, that's -- that's -- I think that's the only thing for me. But otherwise, a lot of the other programs I've seen come through. Maybe one thing is the solar thermal program through the CSI, the California Solar Initiative, I think that program is not already depleted. It's sunsetting and that program was amazing. I mean, it helped pay for 100 percent of the installation and it -- we saw immediate -- immediate savings from the installation.

And the process, too, for that particular program was just so simple. And it's rare. So that is -- that's a program I'd like to see kind of stretch further. And I think it had been

around for already, I think -- what, Peter? I mean, ten years or so.

MR. ARMSTRONG: Yeah.

MS. VUTTHY: Yeah, I mean, it's nice to have programs that last (indiscernible).

MR. ARMSTRONG: Yeah, just -- I mean, for a new construction project, you know, the planning process could take 18 months to, you know, three years before we start construction.

For a rehab project -- I mean, we, you know, we do some things as replacements are needed, but for us, we often do major rehab say every 15 years. And so we may be planning a rehab for, you know, two to three years, let's say.

MS. RAXTER: Thank you very much. All right. So how are nonenergy benefits incorporated into the program process, if at all? And Peter.

MR. ARMSTRONG: I think, you know, for us it's we want what's best for our residents. And so oftentimes, you know, what you would term a positive externality, you know, better indoor air quality, those types of things. You know, safety, those are important to us.

I would say often those are not particular quantified and our funders don't necessarily give us any additional resources to meet those benefits. So it would be great if -- if there were some incentives or other policy -- other policies that encourage us to take those into account as well.

MS. RAXTER: Sochiata.

MS. VUTTHY: For, again, existing properties going in and doing retrofits, we want to make sure that anything else that we're doing, we take the opportunity to again make sure to look at that list of, you know, the roster of measures that we should -- we should take in order to make sure that our properties are sustainable. So things like what Peter was saying, looking at things like indoor air quality. So that means, you know low no (indiscernible) making sure that we have those type cabinets, you know, the edges are filled or formaldehyde free, those types of things we want to make sure we incorporate that into our retrofits as well, if it's useful to do that.

And depending on the size of the -- the rehab that we're doing. And when I say rehab,

I'm talking about $2 million or less. So it's not the big rehabs that Peter is doing on the front end with new developments, new acquisition, but rather upgrading our existing portfolio.

So in that case, you know, again, if we have the funds to do it, we will do more than just the available energy efficiency programs or rebates, that kind of driving the retrofit.

MS. RAXTER: Thank you. The next question is what challenges do you face to performing deep energy efficiency upgrades. And Sochiata.

MS. VUTTHY: An example of challenges that we had was kind of the first version of the Energy Upgrade California Program where there were -- we had to meet a certain threshold, just like 10 or 15 percent -- or excuse me, it was 10 percent and then it was 20 percent. And depending on how efficient you were going to do the upgrades, the rebates depending on how efficient your -- your -- the community was going to be.

So some of what was shown at -- so one thing is as a part of that program, we were supposed to have an energy audit down by a HERS

rater and, you know, again, an existing property, the reason why we're doing energy upgrades is so that we can see a cost savings in our operation. And so I don't have $5,000 budgeted to pay for a HERS rater to come out and do this.

So that was one -- one hurdle that we had. To mitigate that hurdle, we were working with -- I think it was -- it was (indiscernible) at the time, and they helped us look for other resources. And I think we used -- I think it was either county rebates or city rebates that provided some -- provided the reimbursement for -- for the auditor. So once we had the auditor come on using the re -- another source, we had -- they -- they audited the property and we find out that well in order to meet just the 10 percent threshold, we would have had to do, you know, things like window replacement and change out the boilers. You know, bit measures. And we -- how are we going to have the funds to do that? The rebate wasn't going to cover that 100 percent. So how do we -- how do we even get to the 10 percent?

So the way that that was mitigated was at the time, again, through the CSI program, things

like the solar thermal program we were able to get solar thermal which then entailed also upgraded new energy efficient boilers. So that really helped us kind of close that gap and be able to move forward with those retrofits.

But if it wasn't for, again, another source available to combine with a bigger program, we wouldn't have been able to move forward on -- on those things. So.

MS. RAXTER: Thank you. And Peter.

MR. ARMSTRONG: Yeah. I guess -- I mean, it's great that, you know, Sochiata and I work in very similar organizations but at different levels. So oftentimes I'm doing a real big rehab, you know, one that we might be planning for five years and that we might be bringing in lots of other funding sources in order to make it happen.

And so, you know, I worked on a great retrofit project that we finished up pretty recently. And, you know, we ended up getting, you know, approximately 35 percent savings, you know, energy efficiency savings. I mean, it was a tremendous outcome. And so the, you know, the energy measures that we were able to leverage

from Energy Upgrade California, Low-Income Weatherization Program, which is a fantastic program as well was probably about half of the cost of our energy measure. So we got about $400,000 worth of incentives and the cost of those measures were approximately 800,000.

So really the reason why we're able to do those deep measures was because I was able to get the typical standard affordable housing financing sources in order to make it happen. So I think really part of the challenge is really marrying those affordable housing financing sources in some of the incentives that are available for energy measures. And really sort of aligning on, you know, funding cycles, you know, who's going to review and evaluate the work that we've done? You know, can we get one energy auditor to count for all of the different programs? And the regulations really speak to the same savings and measures and outcomes that, you know, that we as a state think are important.

So that's part of the challenges.

MS. RAXTER: Thank you.

So the next question. What funding sources exist for bridge funding to address

unanticipated costs triggered by the building retrofit such as lead, mold, and asbestos mitigation?

And we'll start with Peter.

MR. ARMSTRONG: Well, number one I would say that if I'm doing my job right, there shouldn't be any unanticipated load, mold, asbestos mitigation. When I'm working on a project, typically we will do all of that due diligence ahead of time. I mean, certainly there are cost overrun. At the end of the day, that might be a great time to get that energy upgrade California money. We sort of don't plan for that money but if we can get it, it's great to fill an unanticipated cost.

Oftentimes, you know, we will pay that expense ourselves. So that's not necessarily a great outcome but that's how -- that's how we make it work.

MS. RAXTER: Okay. And Sochiata.

MS. VUTTHY: Yeah, Peter wouldn't be doing his job right if he didn't have over those reports that told me whether -- whether, you know, my floor, my walls are hot or stucco was hot. So I would never get into any type of

retrofit without understanding what I'm working with. So the only thing that I can see from the question, that would really impact me most. I can't necessarily see that.

So if that -- something like that does come up, it would have come up any way during, you know, a turnover or, you know, when we actually plan to hit that unit so it would come out of reserve. It would come out of our replacement reserve if the cash flow wasn't able to bear it.

Otherwise, you know, one of the projects that I worked on using -- using some energy upgrade money and some other reused neighbor work funds because they're national and they have certain class to kind of green and sustain into do green and sustainable retrofit. So in that case, I was able to use other funds to address any kind of behind the wall situation that we didn't know about. So, yeah.

MS. RAXTER: Thank you. The next question, to what extent do you utilize a well-trained local workforce in your energy efficiency retrofit or efforts? And are your building operators trained for new technologies and

equipment such as heat pumps or is additional training needed?

And we'll start with Sochiata.

MS. VUTTHY: So we work with -- we work -- okay, so through our property management company, again, when we're getting ready to do a bigger retrofit, we work with them to identify vendors, other contractors to do the work. And so they have a vigorous -- our property management company has a pretty vigorous kind of list of qualifications or prequalifications and from there, you know, we can go into the whole (indiscernible) process and making sure that they understand what we need, what our scope of work is, and usually what happens is we provide the specifications.

Again, because I'm talking about existing buildings, I already have a set of, you know, this is what we should be replacing with. So as long as they're familiar with that process -- or with the product, then, you know, we just go through the regular process of procuring the contract.

When it comes to kind of new construction, I can speak from this from kind of

a hand over when development hands it over to access to operate, we make sure that if there's anything new, new technology of any source of property, that as a part of the handover, as a part of the punch walk for things before the project is completely handed over to operation, we do a walkthrough with all the subcontractors and they train maintenance person -- not just the maintenance person that's going to be working onsite, but maintenance leadership so the regional director is a part of that training as well, as we have our IC person go in to IUC or our marketing person to videotape the whole training so that if for whatever reason the transfer from one person to the next, you know, doesn't necessarily happen with paper, we have video, we have -- we have it all onsite as well as in our office and the property management office.

Just, again, because we want to make sure that we're maintaining the property the way that it was envisioned to be maintained. So that's our goal.

MS. RAXTER: Thank you. And Peter.

MR. ARMSTRONG: I'm taking notes from

you, Sochiata.

No, I mean, we definitely use a well-trained workforce. I mean, for the most part we'll hire a general contractor to do most of the work that we are -- we're procuring. And most of the times we'll have that general contractor manage the work of all of the subcontractors. So even if we install PV, we'll have the general contractor managing them.

So, yeah, definitely.

MS. RAXTER: Thank you. The next question, why should building owners push for deeper energy efficiency retrofit? What advice would you give to other building owners not currently going beyond the minimum required upgrade?

And Peter.

MR. ARMSTRONG: I think the big challenge is getting at that for process market rate multifamily sector. I think, you know, for our organizations, we really are putting, you know, energy efficiency and, you know, the state's larger objectives, you know, at the center of our work. And so what I would say to, you know, my colleagues who are doing market rate

development who, you know, may be passing some or all of the cost of utilities onto their residents, I really think that is one of the things that we are struggling with.

And so, you know, I would suggest to them that, you know, those co-benefits associated with cleaner energy efficient projects will definitely help their marketability, will probably help their long-term operations, will probably help buffer them against spikes in utility rates that happen from time to time. But I, you know, that is one of the main differences I think between my industry and some of the other builders.

MS. RAXTER: Thank you. And Sochiata.

MS. VUTTHY: Why not? That's -- it's why not for all of the reasons that Peter just outlined. And just to add to that, you know, it is to me, again, existing portfolio, I have -- expenses are rising higher than income. And so whatever I can do, whatever -- wherever I can find an area where I can reduce cost, I will do my best to get that implemented, especially if it's no cost upfront to us.

MR. ARMSTRONG: Uh-huh.

MS. VUTTHY: So that's kind of the hard

to challenge from the other side, so that's one thing.

And the other thing, you touched on it Peter, and that is being able to market it to other folks. You know, there's -- there are certain -- we have a development that are in what I'm calling the submarket of San Diego. So even though it's affordable, you can -- people can easily say that oh, well, next door, it's not that much more --

MR. ARMSTRONG: Uh-huh.

MS. VUTTHY: -- than the rent here. And so well how do then -- how do I make myself make my -- make that community stand out from the rest? And energy efficiency upgrade, they're -- it's an amenity, especially if it's a direct benefit to residents.

So things like -- well, it's a renewable energy, but installing TVs, you know, things like that, and making sure that we have a tenant-based system that is an amenity to the resident. And that's something that I can go out there and, you know, shout it out. And a lot of people now are, you know, people don't really think about affordable and solar TV and, you know, anything.

How -- they just don't think about that because it's like, why? This is not -- we're -- it's for, you know, big buildings and big market rate buildings. And it's not.

And we were able to, you know, let people know and show people that, you know, you -- this is a benefit to you, you're seeing savings directly. So it's a really good -- really good story to tell.

MS. RAXTER: Thank you. The next question is how do you incorporate low-income community-based organizations in your effort and how do you ensure low-income residents are not priced out in the upgrade process?

And Sochiata.

MS. VUTTHY: Well, we are affordable housing nonprofit affordable housers so we're kind of already in that loop.

I -- the second part of that question about not pricing residents out, so again just kind of talking about installing TVs because that's usually the trigger of, you know, whether we can or if we want to impact the residents when it comes to how they're paying their rent. So there's this thing called the utility allowance

and the utility allowance are issued for our properties by the local jurisdiction.

Several years back we started, you know, there were discussions about hey, you know, we're doing all these energy upgrades to these properties, these utility allowances no longer make sense because, you know, I'm doing -- I'm doing all of, you know, putting PV on, I have new windows, I have new this, new that. My -- my utility allowance really should be lower than what -- than what they are.

So with our community where -- all of our communities have low-income housing tax credit on them. And the administrator, you know, issued again sidelines that said that we can -- if we install -- if we do these energy efficiency upgrades and add PV that we can ask for a different utility allowance through their what they call the CUAC. And we actually went through that process for a batch of our properties. Some successful, some not very successful. I can sit here and tell you right now that I think we -- we haven't implemented the CUAC and the CUAC would have allowed us to increase rent to residents because of these retrofits.

And we as an organization take rent increases really seriously especially in the environment that we're in now where we're not trying to push people out and make, you know, cause homelessness. So we decided as an organization that the ones that did make sense, the CUAC that did make sense, that we were not going to move forward with it at this time. Every year we have to reevaluate the rent increases and how the utility allowance impacts those increases. So we do try to limit that. So other than the CUAC process, there's no -- there are no real negative impacts towards residents.

MS. RAXTER: Thank you.

MS. VUTTHY: Uh-huh.

MS. RAXTER: And Peter.

MR. ARMSTRONG: You know, I would just echo what Sochiata just said. You know, our properties are subject to long-term regulatory agreements that limit to when and how much we can give rent increases to our residents. And so even this, you know, despite the fact that, you know, we may be able to pass along our rent increase to a resident, we often do not or we sort of don't give them -- don't give them the

full rent increase that we could. So that's kind of part and parcel of our business, I would say.

MS. RAXTER: Thank you. And the next question is how are residents and multifamily buildings best able to access energy efficiency programs? And how do you as a building owner encourage or permit them to participate?

And start with you, Peter.

MR. ARMSTRONG: I think it's about providing that right incentive to us as the owner. You know, because we oftentimes want to do what's right for our properties, for -- for the larger policy goals that we're all trying to achieve. And, you know, if we can't realize a lower operating expenses for our common areas or for those parts of the, you know, the utilities that we pay, it can be challenging to go forward with an effort to, you know, expend staff resources, time, energy, money in order to find an energy efficiency retrofit.

So I would always encourage the quality makers and the people that are coming up with incentive programs to give the owner some, you know, some reimbursement for their split equity of managing such a project. So that would be

really important. Because we're really, you know, we're really trying to do what's best by the resident and so we would love to install a, you know, a PV system that would offset resident's energy bills as well. So finding that right incentive that can -- can get us to install that system can be challenging. So I would say that. So we need all the help we can get.

MS. RAXTER: Thank you. And Sochiata.

MS. VUTTHY: From my perspective -- I mean, just like what I was talking about earlier, you know, the question about having -- how can residents access these programs. They -- they can because people knock on their doors but I would love it if the providers, again, that's providing these rebates would come to someone like me and ask the manager, the owner, because in that way we can be more comprehensive in how we approach it with the residents.

Again, because the goal is to touch more people and I can help drive that. So that to me is the -- I think is an example of, you know, streamlining it and just making sure that we're catching as many residents as possible.

I think -- yeah, just don't want to miss

anyone. I'm freaking out.

MS. RAXTER: Thank you. And the next question is have you experienced successful market rate multifamily retrofits? If so, what made them successful? Sochiata.

MS. VUTTHY: I do not have experience in market rate. I don't see how it can be very much different from what we're doing really, but I don't.

MS. RAXTER: Okay. And peter.

MR. ARMSTRONG: Yeah, I think, you know, I work for a nonprofit affordable housing developer, I don't do market rate housing.

I think the case studies that I've seen that have been successful for market rate owners have been, you know, they have large utility bills that they can offset, you know, house utility bills that they can offset with renewables or other energy efficiency measures.

And I think one of the challenges is that, you know, we have sort of a class of building owners, developers, operators that, you know, maybe they have a time horizon of five or ten years. So they build a project, they operate it for five, seven years and then they sell it to

somebody else.

And so they may not be long-term owner-operators like, you know we are, so we're very much incentivized to make these energy efficiency improvements to reduce expenses long term. So, you know, saving on our utility bills and reducing our operating expenses really makes our project viable long term. And, you know, we -- we have lots of projects that are 5-, 10-, 15-, 20-unit properties that -- that that's really essential. So.

MS. RAXTER: All right. Thank you. And we're on to our last question. What role can the Energy Commission play to reduce barriers to energy efficiency upgrades and what can other state agencies do to help? And Peter, you're up first.

MR. ARMSTRONG: I think that CEC can really be -- a great role for the CEC would be to bring all of the agencies that are involved in, you know, housing development, housing funding, housing regulations, kind of bring them all to the table and maybe, you know, maybe sort of simplify the metric. What is the outcome? Maybe try to make clear and actionable goals for all of

these programs.

You know, we -- we have three -- I was thinking about this before I came. We have three pretty major affordable housing funding agencies and they all have (indiscernible). For instance, a couple of them are administered by the treasure. One -- you know, a couple of them are administered by the governor. They have different policies and protocols and, you know, their goals and outcomes around energy are not, you know, are not necessarily on the same page.

So I think CEC could do a great job of helping focus the regulations, the incentives, the funding programs so that they're really sort of seamless to people like us and are easy to take advantage of and give us clear guidance and goal posts about, you know, the outcomes that we want to see in our projects.

MS. RAXTER: Thank you. And Sochiata.

MS. VUTTHY: I think that some, again, from a consumer's standpoint simplifying processes to access the programs with funds. The other is when we get to a certain when the property gets to a certain kind of point in its life where we are looking at refinance,

rescindication with tax credits, rehab, major rehab, you know, as the asset manager, as the operator, I have to stay really connected with my team members that is, you know, what Peter does which is development side.

Because what I plan to do in regards to energy upgrades and retrofits could impact the future plans of the property because requirements -- because right -- well right now I believe (indiscernible) allows the property to look back I think three years --

MR. ARMSTRONG: Uh-huh.

MS. VUTTHY: -- on energy efficiency upgrades to count towards the current kind of finance application.

So just kind of making sure that every -- not everyone but all of the funders and policymakers, just kind of keeping that in mind or even -- I don't know if extending it past the three years could be a possibility of -- just make sure you're capturing the good work that we're trying to do.

MR. ARMSTRONG: Uh-huh.

MS. VUTTHY: Because the last thing you want to discourage operators to do the work

because oh, you have to hold off because in just two, three years, we're going to do the state rehab and we want to make that we capture, we won't be able to take advantage of, you know, the upgrades that you're doing because we have to -- we have to meet a certain threshold.

And then the other thing, too, is kind of when you -- if we do do it, if we do do the upgrades and let's say where 25 -- we're already at 25 percent higher efficiency. And if you don't capture that, then the requirement of our (indiscernible) 25 percent of -- on top of that 25 percent --

MR. ARMTRONG: Right.

MS. VUTTHY: -- makes it really challenging. Especially if it's an acquisition (indiscernible).

MR. ARMSTRONG: Uh-huh.

MS. VUTTHY: You know, new construction, whole different story. But when you're talking about, again, existing buildings and working that aspect to make sure that it -- it lives the longest life that it can. That's kind of -- that would be helpful is to kind of make sure everyone kind of understands those timelines and those

thresholds that we have meet and we have to kind of deal with.

MS. RAXTER: Okay. Thank you very much.

And at this time, let's open questions up for the audience.

MR. HANACEK: (indiscernible) question.

I actually, this is like for me personal, but how -- I think you kind of touched on it too.

When a property owner-manager passes all the cost (indiscernible) tenant and they're not absorbing anything. What you're describing is kind of what more like more office model, but I let (indiscernible) at the end of the day (indiscernible). How they set it up. And that's when we shop for rent and things like, you know, that's what we look for in tenants, but I'm (indiscernible) how can -- you mean, like a union or tenants were able to lobby property managers who would otherwise have absolutely no incentive (indiscernible) any you're describing a lot of complexity still trying to help fund this. My case, my property manager, I had to (indiscernible) on to get a new washer and dryer (indiscernible).

So they're not doing much. And so I'm

curious like if you, I don't know, have any suggestions for how would (indiscernible). How could we get action together to actually try and put pressure on our property manager, property owner to do anything at all what they're making on a utility bill (indiscernible).

MS. RAXTER: Is that something you two can quest -- or answer?

MS. VUTTHY: I don't know if I can answer that -- I don't know if I can answer that question. Yeah, it just -- it depends on who the operator is and what size them as an organization. So even if I gave you some advice on how to, you know, sign out there and what to write on your picket. Yeah, I don't know if there would be any movement because again, it's really the owner and what they feel is important.

But, you know, sometimes it's just a little, you know, hey, did you know about this or hey, did you know about that? That's always -- that's always a good thing to just -- again, you know, it's just like educating, we were talking about residents, how to get them engaged. It's the same way with that type of relationship. So. Sorry.

MR. HANACEK: That's okay.

MS. RAXTER: And do we have any questions online? No.

And with that, I believe we are done. Thank you very much everybody.

MR. KENNEY: All right. So I'd like to thank the (indiscernible). So before we adjourn, there's a little bit more housekeeping to it, then, too.

So big thank you to folks who were on our panel today, to our moderators, and especially to the city of San Diego for hosting us at this -- at this event.

I wanted to take a moment to remind everybody, you know, all that we've learned today, all we've learned throughout this process as being incorporated into the action plan that we're acting on. So the docket is open, we've had a lot of great comments today. If there is more you would like us to know about whether or not you were able to come up to the mic, written comments are always welcome and really helpful.

We do have a transcript of the event today so that's to anything you've already told us will be taken into account but sometimes when

we sit down and write we can add a lot more detail or we can link to reports or there's research that really help put your point across further than we can integrate into a report. So the links are available on these slides. If you have any, you know, if you have any issues, you can talk to us, reach out to us, we're happy to answer any questions about the process. So the docket is open until May 15 at 5 p.m.

And again, just a big thank you to everybody. I wanted to just pause for a moment if anybody needed to come up and have a final closing comment. So I'll just pause for a minute.

It doesn't look like any final comment. So we will adjourn. And, again, a big thank you to the city of San Diego for putting us up with the expense.

(The workshop adjourned at 4:17 p.m.)

CERTIFICATE OF REPORTER

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 21st day of May, 2019.

MARTHA L. NELSON, CERT**367

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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 transcribed
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I certify that the foregoing is a correct transcript, to the best of my ability, from the electronic sound recording of the proceedings in the above-entitled matter.

Martha L. Nelson

May 21, 2019

MARTHA L. NELSON, CERT**367