DOCKETED	
Docket Number:	19-IEPR-06
Project Title:	Energy Efficiency and Building Decarbonization
TN #:	228059
Document Title:	Transcript of 04152019 Workshop for the California Energy Action Plan
Description:	N/A
Filer:	Cody Goldthrite
Organization:	California Energy Commission
Submitter Role:	Commission Staff
Submission Date:	5/6/2019 1:12:44 PM
Docketed Date:	5/6/2019

CALIFORNIA ENERGY COMMISSION

STAFF WORKSHOP

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

CALIFORNIA ENERGY COMMISSION (CEC)

REDDING ELECTRIC UTILITY

3611 AVTECH PARKWAY

REDDING, CALIFORNIA

MONDAY, APRIL 15, 2019

10:01 A.M.

Reported by: Peter Petty

APPEARANCES

COMMISSIONER PRESENT:

J. Andrew McAllister, Commissioner

CEC STAFF PRESENT:

Michael Kenney
Brian Samuelson
Eddie Rosales
Kevin Uy

ALSO PRESENT:

Nick Zettel, Assistant Director, Redding Electric Utility

PRESENTERS/PANELISTS:

*Jane Elias, Sonoma County
Kerri Timmer, Sierra Business Council
*Michael Winkler, City of Arcata
Karen Derry, Karuk Community Development Corporation
Richard Oberg, Sacramento Municipal Utility District (SMUD)
Cheri Chastain, California State University, Chico
Sean Armstrong, Redwood Energy
Nathan Aronson, Redding Electric Utility
Lou Jacobson, Redwood Coast Energy Authority
James Takehara, Shasta Lake Electric Utility
Matt McGregor, SMUD
Derrick Ross, UC Davis Western Cooling Efficiency Center

(*Present via Webex)

INDEX

		Page
1.	Opening Comments	4
2.	Rebuilding Stronger After Disasters (Jane Elias)	18
3.	Local Government Energy Efficiency Action (Brian Samuelson, Michael Winkler, Kerri Timmer, Karen Derry)	33
4.	Building Decarbonization – Opportunities and Challenges (Eddie Rosales, Richard Oberg Cheri Chastain, Sean Armstrong)	80
5.	Energy Efficiency Action from POUs and CCAs (Michael Kenney, Nathan Aronson, Lou Jacobson, James Takehara)	121
6.	Capturing Energy Efficiency from Indoor Agriculture (Kevin Uy, Derrick Ross, Matt McGregor)	157
Adjournment		188
Reporter's Certificate		189
Transcriber's Certificate		190

P R O C E E D I N G S

APRIL 15, 2019 10:01 A.M.

MR. KENNEY: Thank you for coming out to our second workshop for the California Energy Efficiency Action Plan.

Can everybody hear me okay in the room? It's a good volume? And -- all right, excellent.

So what brings us here? This is a brief agenda of what we're going to be covering today. We'll have some introductory remarks from Commission McAllister, get into some details about what the plan is that we're working on and what we want your input on. And then we're going to be hearing from various folks on topics related to energy efficiency and rebuilds, local government energy efficiency action, building decarbonization, how POUs and community choice aggregators can push energy efficiency, and then how indoor agriculture can be used to -- we can capture more energy efficiency from the indoor agriculture sector.

So, what we're hoping to do today is one, hear the successes and the challenges you all are facing in these various activities, to learn about the best practices you guys are using or would recommend, and what you would then like to see us at the state be able to do or what actions we may be able to take to either, you know, influence policy, to make regulatory changes, or just let the market know that there are certain programs or projects that are out there to

just raise awareness.

So throughout these five workshops, we're going to be bringing up a lot of different topics, multifamily energy efficiency, both industrial and agricultural energy efficiency. We're also be talking to air districts, and folks involved in building decarbonization and across the energy efficiency program, implementation spectrum from the IOUs, POUs, regional energy networks, and CCAs.

So we will be having our docket open until May 15th for folks to write in comments, that's the best way for us to hear feedback apart from the comments you raise today in the workshop. And within the notices for the workshops, there are a list of questions as well that we would really like for all of you to look at and if you can provide responses to those areas that are under your expertise. And so, both comments on those questions and comments on the panels that we hear today and other discussions that come up.

So we will be taking off next week for Fresno, that will be the third stop of this roadshow action plan, and then we'll be heading the following week down to Los Angeles and San Diego. So there's information on our website for those as well if you'd like to call in and listen to the topics we discuss there. There might be overlapping topics, but the voices will be different and they'll be tuned to what's happening in those areas.

And so with that, I'd like to pass over to Commissioner McAllister to make some opening remarks.

COMMISSIONER MCALLISTER: All right. Thank you, Michael.

So thanks everybody for coming. I want to first just really deeply from the bottom of my heart thank Redding Electric for hosting us -- really, it's a -- tremendous what you're doing. We just got a little tour of the facility here at the headquarters and learning a little bit about the programs -- little more than we knew already. And just a solid work on the IRP that was recently submitted and energy efficiency, you know, is part of that. And really, it's great to see that innovation, looking at all resources and comparing them and planning really with grid modernization and decarbonization in mind, it's just tremendously gratifying to see that.

Also, thanks to staff, Michael and all the staff, Heather Bird and just all the staff that's been working on this event but also really overall the whole roadshow and planning the topics and getting the speakers, it's a lot of work. So, we're all going to benefit from that, so thanks to all the staff at the Commission.

I believe that it is deep -- it is supremely important really -- it's critical for us in Sacramento to get out and talk to people in their own element and listen to

what's really going on out there. Because if we don't do that, the policies that we advise the legislature to create, the policies that we implement, won't be right, they won't be as good as they could be.

And we really need that honest feedback, you know, I'm the las -- I'm definitely not defensive, you know, I think the Commission listens and we hear what people have to say, and we try to fix it. You know, it's -- it's sometimes it's bureaucratically a little bit difficult to fix things, but we try our best. But we -- to get that real kick in the pants, you know, we need strong advocates out there in the world to tell us what we ought to do.

And so I just exhort everyone listening to this, there are a few people online, so thanks for tuning in and all of you who came today who are going to be here through the course of the workshop, you know, thanks for your honest opinion, you know, everybody needs to put their thinking caps on and figure out what's going to work up here in the northern part of the state.

Energy efficiency is a core policy in California, in the energy sector. It's fundamental to what we do. It has been for 40 plus years and it's going to remain so. As a resource, it's still cheapest and best. It's not free but it is -- it has all sorts of cobenefits that I think are underappreciated if we just look at it through an energy

lens. And so, it can really help our communities, our buildings, our indoor air quality, our economy, lots of jobs associated with energy efficiency.

In California, the -- there are about 400,000 clean energy jobs. It's a big number. It's a significant number. Have a look at the U.S. Energy and Employment Report that came out about a month ago. And across the nation, they look at energy -- clean energy jobs and traditional energy jobs. And California has by far the largest clean energy workforce. But we could double that, we could triple that, we could have good jobs right here in Redding, you know, all over Northern California retrofitting existing building and it's going to take some resources absolutely, we need to talk about where those resources are going to come from. We need to push the legislature a little bit or at least give them some ideas so that they can free up some funds that are going to -- that could be leveraged then to update our existing buildings.

But all sorts of up side. And especially in a place, you know, rural economies where, you know, your incomes tend to be lower and the economy needs a boost, it's always looking for new sources of jobs and economic activity. Our existing buildings are just a canvas that is waiting to be painted upon in terms of improving their performance.

And so that is California's project. You know, we've been told by the legislature that we need to double energy

efficiency. We have strong -- among the strongest decarbonization goals and renewables goals. And that's not just going to happen, right, we really need to find the keys particularly on the energy efficiency stuff and particularly on the existing buildings, you know, industrial and ag are really important, new construction, we have very strong building codes. And all that will continue but our existing buildings, I think, are the -- probably the most difficult nut to crack. And it's going to take resources.

So, again, that's why we wanted to get out around the state and just have this -- begin really this conversation. This is one meeting, but I think part of the hope that I have is we can kick off a conversation and then keep that conversation going. And, you know, all of you from this part of the state, it's a couple hours to, you know, get down to Sacramento and participate in a workshop, we're Webex enabled so, you know, absolutely, you know, pay attention to the docket and get online and if we're doing something -- if we're going off the rails, you know, we need to hear from you that we're doing that.

But the action plan that will be developed as a result of these workshops and a lot of other work with stakeholders and industry, trade allies, building sector, you know, advocates of all different types, it's going to be policy for the state. It's going to be policy for, you know,

the coming years and certainly till the next update three years from now, it will be the central policy for energy efficiency in the state.

So we're working together with the Public Utilities Commission, certainly want to engage with the POUs through SCPPA and NCPA, but it's going to take more than a village, it's going to take really the whole state mobilizing to make this happen.

And I think -- the last thing I'll say is if we think about where we want to be in 20 years in 2040, in 2050, we -- there's a pretty – there's a pretty wonderful vision that I think we can all work towards. It's, you know, it's a place where our energy bills are manageable, our energy's clean, our air quality is improved. You know, across the state we have areas where our air quality is really horrendous. And it's better than maybe it was in the '70s, but it's still in violation of federal, you know, of kind of common sense air quality standards, you know, it's having an impact on our health.

Our buildings will perform better, they'll be healthier and safer, and we, you know, we'll have likely less combustion inside. And that is a -- that's going to be an outcome along with a whole bunch of other positive outcomes for property values and just quality of life generally that improving our buildings, focusing on our buildings will

produce.

And so I think there's a -- there's a pretty compelling vision that can be motivational for us to move forward on this stuff and -- but it's going to look different across the state. We have a very diverse state, we have dozens of languages, we have all sorts of different types building stock, vintages, you know, obviously we have lots of climate zones.

So it's -- there's no one size fits all, but there is I think a general direction that we're all going to be rowing in, we're all going to be rowing together towards this clean energy future, you know, certainly on the supply side and we need to make sure that energy efficiency, the main response, and building performance is the biggest resource it can be. Because that makes all of our other problems smaller. You know, if we have less consumption over all, we manage our demand, manage our load shapes, you know, and get that peak down, we can invest fewer resources in wind and solar and everything else that is supply. And so it just becomes a more manageable part of our economy and we can use that -- the leftover funds to do other things, right? And so, just a healthy economy dictates that we focus on our buildings and improve their performance.

So with that, I'm going to be quiet and let the other people who know more than I do speak, but I think there's a

project in California that others are looking at across the globe. And we need to be successful, you know, we need to figure out how to make this work and work with our local jurisdiction across the state to see what works in each place.

So again we really thank you all for coming, thank Redding for hosting and all the interesting work that they and other POUs are doing across the state, it's really exemplary.

So with that, I'm looking forward to hearing the panels and hope that you all keep in touch through the docket and submit your best ideas to the docket there by May 15th on this workshop. But really going forward, you know, all summer we're going to be taking comment. So thanks again.

So Michael, back to you.

MR. KENNEY: All right. So now we're going to jump into a little more detail about what this plan is to give you some background as we then go forward into the topics for the rest of the workshop.

And just briefly, so I'm Michael Kenney, with the California Energy Commission. Part of our efficiency division and we're the ones leading this action plan. So it's all good. All right.

So just a bit of background about where this plan is coming from. So we have been driven in large part by two

pieces of legislation, AB758, Assembly Bill 758, passed in 2009 which directed us to create this ten-year roadmap of energy efficiency focusing on existing buildings in the residential and commercial sector.

And so in 2015 we put out a plan and subsequently updated it with a series of goals and strategies in mind that we thought would just continue to push the dial on energy efficiency. There was workshops associated with that where we drove across California in a similar fashion to hear input from folks.

Subsequently in 2015, Senate Bill 350 passed which was quite comprehensive and one piece of that took energy efficiency and told us to not just try to incrementally improve it but to hit a certain target by 2030.

And so we were now given a task of finding where we're at in terms of annual energy efficiency statewide and where we need -- what we need to do to then double what we expected in 2015 by 2030. So quite a large goal to hit.

And so in 2017, we put out this initial report assessing all the different areas where energy efficiency was coming from and our best estimates for what those values were and recommendations to help us achieve more. And so we were now not just focusing solely on existing buildings, through residential and commercial, but now looking at agriculture, industry, new construction, even conservation voltage

reduction so in your local distribution system. So our scope grew a lot over those years.

And then even more recently now, we have Assemble Bill 3232 which wants us to look at how can we at the same time reduce the carbon that's being emitted from our buildings? So try to reach a 40 percent reduction of our 1990 levels by 2030.

So these three large policy drivers all overlap with energy efficiency and so instead of having three different reports for everybody to try to read, it made the most sense to combine all these efforts.

And kind of orbiting around all of this are issues around energy equity and so we've put out prior studies, "The SP350 Low Income Barrier Study," and the "Clean Energy in Low Income Multifamily Buildings Action Plan." And so these recommendations and topics are also going to be worked in to this report because at the end of the day, all Californians need to benefit from the policies that we're putting into place.

So we'll be through this report updating those targets that we set in our initial Senate Bill 350 Report, check where we're at, were we achieving the savings we expected to historically, and are we getting closer to achieving this 2030 goal or are we further away?

We need to establish a new targets for agriculture

and industry, and conservation voltage reduction, which were areas where we didn't have really any expertise coming into that initial target setting.

We need to hear from all of you to make the best policy recommendations we can in this report and then revisit it on a regular basis. So every two years, revise our targets, revise our recommendations. And in between years within our large policy report, the Integrated Energy Policy Report be updating any major things through there. So that way folks are always up to date on what we're doing and where we're at.

So this plan, I apologize for how small it is but essentially the structure for it as I mentioned with the policy drivers are these three big goals of doubling energy efficiency by 2030, expanding energy efficiency within the low income and disadvantaged communities, and decarbonizing buildings.

So these are all goals that are then being guided by our -- these principles that are in those seven gold rings up above. So keeping things market centered, making sure all of our energy remains reliable, that the energy efficiency we are claiming is quantifiable, that any programs or recommendations that we have are scalable, that we're coordinating with folks, so, where that's coming out and coordinating with local governments or coordinating with

other state agencies, we need to make sure that things are cost effective. We only want to put things forward that are going to make sense for, you know, what people can afford.

And to also keep in mind nonenergy benefits, which Commissioner McAllister alluded to that energy efficiency doesn't just lower your energy bill, it often improves the air quality of your building, improves the comfort for folks who work or live in those spaces. So there are side effects to these measures that shouldn't be discounted.

So with that, I'll take any brief questions about what this plan generally is before we jump into our first actual topic.

COMMISSIONER MCALLISTER: Let me ask maybe if there is a safety briefing or something.

MR. KENNEY: I guess.

COMMISSIONER MCALLISTER: I actually wanted to defer to Redding, is there any sort of safety points or logistical things you guys would want to let everyone know of before we. Sorry, I usually think about at the beginning of the meeting but -- but I know in the utility business, you know, you want get people oriented.

Yeah, so yeah, the housekeeping piece of it. Sorry.

MR. ZETTEL: So, quick housekeeping --

COMMISSIONER MCALLISTER: What's your -- state your name.

MR. ZETTEL: Oh, sorry, Nick Zettel, with Redding Electric, assistant director of Resources.

Quick housekeeping, restrooms are right out this door to the left, men's and women's, there's a breakroom right to the right and immediately left.

In the event of an evacuation, we'll all head out and we'll make a left out of this building, right out that door, and then we'll muster over by the fenced in parking lot until EMS arrives. So if any alarms sounds, that's what our -- that's what we'll do, whether it's fire or, you know, any other thing that can go wrong, active shooter or anything. So.

Thank you.

COMMISSIONER MCALLISTER: Thank you, Nick.

MR. KENNEY: Okay. So with that, are there any questions? Or on the phone, anything? No.

All right. Well then with that, we can move forward to our first presentation of the day.

And so, this is from Jane Elias, who will be joining us via the web. Jane is the Energy and Sustainability Program manager for Sonoma County. Jane oversees various community programs in order to accomplish the Division's goal to promote and deliver solutions necessary to mitigate environmental impact and address climate change. Through these resources and programs, the reduction of greenhouse gas

emissions and local job generation is achieved.

Jane works closely with partner agencies, governments, nonprofits, contractors, and other private entities to accomplish the Division's goals.

The central functions of the Division include tracking and reporting county operations, internal utility services, facilitating reduction of internal greenhouse gas emissions, participating in regional coordination efforts, leveraging best practice and policy development efforts, educating the public about the benefits of building upgrades through energy efficiency improvements, and offering workforce development opportunities.

Jane holds a bachelor's degree from the University of California, San Diego. She has been involved in energy efficiency, building science, green building, and renewable energy for nearly 20 years and holds certifications in each of these sectors.

So I'll turn it over to Jane to give a presentation.

MS. ELIAS: Great. Thank you, Michael. Good morning. Can everybody hear me?

MR. KENNEY: Yes.

MS. ELIAS: All right. Well, good morning, Commissioner McAllister, Michael, other CEC staff, and of course everybody attending.

The -- well, lengthy introduction there so I just

want to jump in here and really kind of spell out for you in the first couple of slides a little bit about what we do here at the Division and then how that fits within the framework of disaster and resilience.

First of all, our Division sits within general services. So during the occasions when we do experience natural disasters, our staff generally does work in the Emergency Operation Center in the logistics section.

In addition, since much of our work is central to energy efficiency, we are very familiar with buildings.

And Michael, how am I forwarding slides?

MR. KENNEY: I'll forward them for you.

MS. ELIAS: Okay. Got it. Thank you.

All right. So the public gains that we serve are all about saving money, water, energy, increasing comfort, obviously creating energy independence and the durability of buildings. We manage several community programs here in the office, all with these needs in mind.

In addition, we've received a few grants over the years that are related to energy efficiency, but also specifically to electric vehicle charging infrastructure throughout the county.

And all of this, as Michael had stated, and was -- said early is kind of all surrounding our local goals when taking into account legislation like 32 and Assembly Bill 758

and 350 to just name a few, and then really trying to align those with the state goals of reducing the greenhouse gas emissions and increasing energy efficiency.

Next one. Okay. We have a staff of eight people and with a combined experience of over 60 years related to buildings and energy efficiency. They hold multiple certifications related to, as Michael mentioned earlier, about building construction, building science, building codes, compliance, energy modeling and testing, green building, zero net energy, solar design installation, water conservation, and landscape design concepts.

The -- this is just some of the services that we offer here on this slide, and some of those specific certifications around there are, you know, just to name a few are LEAD, Building Performance Institute, HERS, CALGreen Inspection, and Certified Energy Analysts are here in our staff. Along with some qualified water efficient landscaping, and EPA WaterSense new homes inspector, so we do try and incorporate water into the energy efficiency factor as well.

We assist customers through a variety of these services and then those customers include the cities, towns, special districts, businesses and residence, both renters and homeowners, to increase the energy efficiency in their buildings. Through a number of these services such as audits

or energy retrofit projects, the rebates and the financing that we do offer through both our local government, but partnership of on bill financing and then through our PACE financing program, the Sonoma County Energy Independence Program.

We work to try and build partnerships throughout the county, to leverage resources and avoid the duplication of efforts. And we offer, as I mentioned the PACE financing program here which really centers around energy efficiency, water and solar improvements, and then just this last year we also added the new construction element for PACE that was allowed back in 2014 with legislation.

We provide no cost, impartial information to education community members so that they can make informed decisions about -- related to building improvements.

And go ahead and forward to the next slide.

So one of those no-cost improvements, I want to really kind of focus on in this presentation, but we offer a number of different consultations. For several years we brought online for residents and businesses who were interested in going solar, but weren't quite sure where to start and what to ask contractors when they were getting bids.

We also help homeowners make action plans for those wanting to improve their existing buildings to increase

energy efficiency. And some of those improvements were around making the building long-lasting and more durable.

When the fires occurred in the fall of 2017, which resulted in a loss of about 5 percent of the housing stock in the county, we took that experience that we had here with the staff and we shifted to include new construction consultations.

By January of 2018, we began offering the rebuilding consultation. Most of these homeowners, of course, never intended to build a home much less have to rebuild after a natural disaster that was so devastating. And much of that housing stock that was lost, was somewhere in the range of 30 to 50 years old and built prior to any kind of energy codes existing in California.

So, we worked with several of our partner agencies throughout the county to try and deliver a consistent message. Our permit resource management district, the building department, the City of Santa Rosa's Building Department, our water agency and other local water districts, the newly formed office of recovery and resiliency here at the county, builders exchanges, and of course our electric power utility providers, Pacific Gas and Electric, as well as our community choice aggregation company, Sonoma Clean Power.

In addition to the air districts, namely the Bay Area Air Quality Management District, we wanted to ensure that

what we were doing and what for offerings could align with the incentives that they put together for rebuild folks, and we took a look at the current energy codes and information that was available regarding the 2019 energy code that's going to be coming along the line soon. And with that we created a one-page best practices, I guess if you will, for homeowners to consider when they were going to rebuild.

These five items that we focused on were by no means required for people to build especially at the performance standard. However, a few of them are required if they were going to be building prescriptively to the energy code. But to really give them a little bit of education and focus on what some of this meant, we -- our design was really to help homeowners and some builders navigate through some of the terminology, the concepts, the considerations prior to getting their plans done. As I mentioned, so many of these people never intended to build much less have to maneuver through, you know, all sorts of jargon around building codes and soils testing, engineering, and what have you. So it was really something pretty overwhelming for a lot of folks.

We wanted to let them know that there were local incentives available to them and what those incentive levels meant. And then to understand in order to meet those incentives, there were a few keys things that they really needed to do. One of which was hiring a certified energy

analyst to do their energy calculations. Without that key factor, they wouldn't be able to even -- that was really a key to getting the incentives was to have the -- their energy calcs done by a CEA. So regardless of whether or not they were interested in the advanced energy rebuild incentives, we certainly still encouraged them to get their energy calculations completed by one.

Next slide.

So in addition to the individual one-on-one consultations, we also launched rebuild workshops in a series of these throughout the community and over this last year. They've been well attended throughout, roughly 25 to 30 attendees in each, and we really did it focusing on the areas in the county that were going to be -- having to do the major part of the rebuild.

Next one.

So along with those, and these are just some of the numbers, some successes to date, I would say of those one-on-one rebuild consultations and I will note that most of those 79 rebuild consultations that have been performed, at least 95 percent of those people also coupled on a solar consultation. There's been a great amount of interest of people rebuilding and either going solar at the time they rebuild or at least making their building solar electric ready and having that conduit run and everything while all of

the construction was open and easy to access.

But we also focused on the 13 rebuild education presentations. We partnered with the Permit Resource Management District, the water districts in the city of Santa Rosa, to present to large employers, letting them know about the services and to cover some of the high-level topics around energy efficiency and rebuild. We had employers like Kaiser, Sutter Hospital, St. Joseph's Hospital, were three. We had an inordinate amount of medical industry lose their homes. And I want to say it was somewhere around 200 doctors and then, you know, even more than that medical staff, nurses, and other people working at the hospitals that lost their homes.

We also presented to other larger employers, the city and the county were a couple of others.

And then neighborhood groups began forming almost immediately, and block captains were created, block captain meetings and then these neighborhood meetings where we would go and present to these groups throughout the -- through invitation and covering, you know, many of these same areas of topics that we have expertise in.

Next one.

So along with all of those efforts, we also focused on education and training. A little bit more specifically, if people had a desire to get more technical and we partnered

with agencies listed there in the slide to bring free half day classes to cover many of these topics that people may want to consider or interested in learning a little bit more detail about. And these were really well attended throughout the time. And given that we have probably a little less the -- a little more than half the permits still not pulled although we've seen it in just -- in the last few weeks, a recent upsurge, there's still an awful lot of building left to go forward. And so we'll probably be looking at adding some additional classes in these next several months that are very similar to this series.

Next one.

Around workforce development, we also brought in the summer of 2018, we partnered with Pacific Gas and Electric and brought in the MI-BEST Series so that contractors could have some hands-on application and demonstration of what some of these specific measures were. Some of it just kind of as a refresh and others who hadn't really been involved in new construction but were shifting gears and going more so for retrofit to get into new construction since we needed the workforce demand. We wanted to have this hands-on and let them have an opportunity to learn.

Next one.

So I mentioned earlier that there were several agencies that we worked with to collaborate and make sure

that we had kind of similar messaging and got the word out. And we've done this through so many, you know, social media, and ads, radio, print, digital, it's been phenomenal the support efforts throughout the county.

I just wanted to kind of spend the next couple of slides talking about a few of these agencies. The Office of Recovery and Resiliency, which was newly created for the -- to deal with the 2017 fires, and of course, kind of retooled a little bit this last winter to deal with the floods that we had out at the river area.

Really focusing on these five sectors of community preparedness. And so taking what happened and then really looking toward the future around making sure we have some recovering resiliency in place.

Our Permit -- Permit Sonoma brought in place a whole line up of additional resources to try and expedite the permits. And then with working with the city of Santa Rosa both the county agency and the city reducing some of those permit costs. And then also really focusing on the need for additional housing here in the county and to look at additional dwelling units and reducing the cost of those permits to issue for ADUs.

Next one.

And Sonoma County recoveries, this website was a combination of both the county and the city and was brought

online pretty quickly, I'd say within a few weeks of just -- of the fires happening. And these joint efforts again, the partnership and the collaboration to get the message out there to as many people as possible.

And then one other thing, just around energy and water, the Sonoma-Marin water saving partnership, I did want to mention as well. They brought online the ready to permit landscape design templates and -- which was really great, the people -- I think they had six different plans for different types of houses and focus on landscape design for people who were having to rebuild. And those were free to download and utilize with a whole list of the plants and what have you as well as considerations around, you know, the first 5 feet and 10 to 15 feet and then beyond that of making sure that people had that in place to prevent further damage if -- with the other fire possibilities.

Those are just a few of the partners that were key in getting this vital information to people that needed it and the process that was necessary to get the paperwork going to rebuild. There's been a tremendous amount of support throughout the community and much rebuilding going on. And just, you know, the success to date, I mean, we've got like I mentioned about half of the permits and an awful lot of rebuilding going on.

But the collaboration and the support and the speed

of some of these agencies to come on board and start offering these services has been tremendous. Of course some of those challenges still -- still happening. I mean, initially the insurance was really a big barrier for a lot of people and so many were underinsured here in the county and, you know, that's going to be seen again with a bit more stress coming online soon as the money that they have towards renting is going to be going away fairly quickly. And with so many permits that are still left to be pulled, we were looking to try and see what we can do for that next wave in addition to these services that we have in place and that we continue to offer.

So with that, I think that the last slide is -- I'm happy to answer any questions and thank you for letting me present today.

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

So if folks have questions here in the room, if you wouldn't mind coming up talking into the mic. Seriously that way everybody can hear you both on the phones.

Does anybody have any questions for Jane? We got one question, Jane.

COMMISSIONER MCALLISTER: I'm not going to monopolize the conversation. So is this the mic right here?

MR. KENNEY: Both. That's for the court reporter and that's for the Webex.

COMMISSIONER MCALLISTER: Okay. Well, I'll just hold them both up.

So thank you very much for that, that was great. This is Andrew McAllister. I guess I wanted to know about PACE and how -- what sort of the current status in Sonoma. You know, that's been a really invaluable source of capital for upgrading existing homes really around California, you know, we pioneered that idea.

But there's kind of a backlash brewing about, you know, truth in lending in -- at the federal level and also, you know, a few, a small percentage of kind of well-publicized PACE customers who are unhappy. And, you know, I think that PACE is a great tool and hopefully going forward. I guess, you know, as a public entity managing a PACE program, how is it panning out? How's the sort of brand and sort of reality of PACE evolving in Sonoma?

MS. ELIAS: Okay. There's a lot in that question. So. But as far as PACE goes, for those people in the room, the Sonoma County Energy Independence Program is ten years old and from the beginning we offered residential and commercial financing. And that's been like I mentioned around energy efficiency, water generation, electric vehicle charging. And then our board last June authorized us to add new construction based on the 2014 legislation around that because of the rebuild effort. There's been a few logistics

in that just trying to work out some of those details.

But from -- to answer your question, I mean, PACE is -- we're still seeing people here in Sonoma County using it. We do have our municipal PACE program that we run as well as there are private PACE providers operating here. And what we have seen because of a lot of the legislation passed last year and the year before is quite a slowdown of the third-party PACE. However, what we have seen is a little bit of that. As those have slowed down, people have actually -- our PACE financing that we offer has increased and that's because as a local government running our own PACE program, we are exempt from the regulations that were put in place with some of those pieces of legislation a couple of years ago.

And so we don't have the oversight by the Business Oversight Department, although, we -- that said, I mean, an awful lot of what we do covers much of what they are. They utilized Sonoma and Placer County and looked at what we had in our underwriting criteria and consumer protections and what have you in putting together some of their regulations and some of that legislation detail.

And so we don't have that as Commissioner McAllister has mentioned that ability to repay verification that is happening here in the state and then is now under consideration in the advanced rulemaking process at the

federal level through the Consumer Financial Protection Bureau. And that open comment period is happening right now. The city of -- or the county of Sonoma and -- is going to be responding to that rulemaking process and offering up comments by May 7th. So that -- we're not quite sure what that's going to look like. There could be a huge impact on PACE nationwide depending upon where that goes.

And then just recently last year, the legislation passed that the state's 465 for PACE and fire hardening, that is something that we are also going to be going back to our board of supervisors in this next month to start the resolution of intention and the validation action around adding the fire hardening or wildfire safety provisions that can be covered under PACE. At the same time, they are also interested in going ahead and adding seismic because that legislation was passed, I think back in 2011 and it's something that we have not had a public demand for, however, all we need is one event to occur and then we will be hearing about it.

So while we're going through that validation action at the state then in which, you know, can be rather costly, we're going to go ahead and do both at the same. So that we can really have PACE as a tool for resiliency and people who want to go ahead and have that financing option to make their buildings -- their existing buildings more durable and

hopefully prevent some of the damage and things that may occur from natural disaster.

MR. KENNEY: Great, thank you.

Any other questions? No. Okay.

Well, Jane, thank you so much for your presentation. Looks like that's all the questions we have in the room right now, but again, we appreciate all the input and look forward to learning more.

MS. ELIAS: Great, thank you. And I'm happy to answer any questions that may come up from other people in the future, you've got my contact information there.

MR. KENNEY: All right. So now we'll be moving forward in our agenda to our first panel. So this is a panel on Local Government Energy Efficiency Action.

And following this panel, we'll be having our break for lunch. So I'll be introducing Brian Samuelson as the moderator for today's panel.

MR. SAMUELSON: And then if Kerri and Karen want to join up.

All right. Well, good morning everyone. My name is Brian Samuelson, I'm with the California Energy Commission. I am in the Demand Analysis Office of the Energy Assessments Division, and I'll be moderating this panel today.

With me I will have two in person and one on Webex. The first that I'll introduce is Kerri Timmer, vice president

of -- and climate change and energy at Sierra Vista's Council.

The Sierra Business Council is a nonprofit organization promoting the environmental, economic, and social well-being of the Sierra and its rural communities. Kerri manages SBC's Sierra Nevada Energy Watch Program that partners with municipal-- excuse me, municipalities, special districts, and selected schools across 11 counties to advance climate action and energy efficiency programs, and she advocates on those and other regional priorities in the state capitol.

Prior to SBC, Kerri spent six years as regional policy and program director with the Sierra Nevada Conservancy and operated her own consulting practice for ten years working directly with community-based nonprofits and strategic planning and project implementation.

Next we have Karen Derry. Karen is a Karuk tribal member and has been the economic developer operations manager for the Karuk Community Development Corporation for five years. Previous to that, she was executive director for 17 years for a nonprofit organization located in Happy Camp. In her position at the KCDC, her responsibilities include operation of the Karuk Head Start Program with two center locations, Yreka and Happy Camp. The Amkuuf Smoke Shop located in Yreka a community workforce development computer

center and many storage units both located in Happy Camp and fiscal oversights for the Karuk Fire and Fuels Reduction crews. She has been learning about renewable energy for four years now and is excited about the progress that has been made so far.

Finally, we have Michael Winkler, he's joining us by Webex, vice mayor of Arcata, board chair of RCEA, Humboldt County CCE, and a partner at Redwood Energy. Michael has 22 years' experience in energy -- energy analyst for more than 200 large affordable housing projects throughout California, many of those are zero net energy, energy research engineer, HSU Schatz Energy Research Center from 1997 to 2009, has a bachelor of science in physics from the University of Illinois, bachelor of environmental resources engineering from Humboldt State University. He has also converted his home to zero net energy in 2003. And lead role in high energy use tax, which eliminated 98 percent of the 1200 large residential cannabis grows in Arcadia -- Arcata.

So with those introductions, we'll go ahead and start with our questions.

So question one. What energy initiatives are you proudest of in your jurisdiction? Whether that's region, district, tribal territory, et cetera. And then feel free to answer those when you're ready.

MS. DERRY: Is there any particular order you're --

MR. SAMUELSON: No particular order.

MS. TIMMER: Well, thank you so much for the introduction.

I just want to describe very briefly that the program under Sierra Business Council is a little bit different, I think, than many of the other programs that you're going to hear about today because we are a nonprofit entity that serves as a liaison with local governments to help provide these services. So we work through 11 counties, it's quite a big jurisdiction that we're covering.

And so the kind -- the programs that we provide run across three gamuts. One is climate planning because we firmly believe that particularly in areas like ours that are largely rural, hard to reach geographically, widely distributed distances between communities and such, there just isn't really the capacity to take -- take on energy efficiency proactively headfirst unless there's somebody kind of prompting that activity.

So we have started with our own climate planning program where we have done 28 different energy action plans. We've done one full climate action plan. We've done nine different greenhouse gas inventories for different jurisdictions. We have done greenhouse gas accounting for specific projects. All of this by way of helping to educate communities that otherwise might not be naturally engaged in

these activities.

And also we -- the region that we work in is very politically conservative which is awesome but also a little bit challenging sometimes when it comes to trying to make the argument for why a government agency -- or entity -- local government entity should contemplate doing these activities. They're not necessarily motivated by helping to achieve statewide energy efficiency or greenhouse gas reduction goals, they're not even necessarily that familiar with and therefore interested in some of the nonenergy benefits as we had -- as the Commissioner had talked about earlier today.

So we view the climate planning piece of our program as critically important to serve as a pipeline toward actually achieving energy savings projects on the ground. So that's -- that's the piece that we are quite proud of.

We also until last year had served as the direct installation element for actual projects on the ground across these 11 counties, and that was really exciting to be working with small, medium size businesses in these communities that again otherwise might not really be contemplating this kind of activity.

Unfortunately, and this may be a theme that we'll touch on throughout these questions, but the cost effectiveness of providing these services particularly in rural hard to reach areas has led the investor on utilities

to start backing off of support of these programs. And so we had the direct install portion of our program taken away last year, so we're no longer doing the direct install piece. Which is tough because that's a big seller, I mean, when you can come in and say we're going to help you actually reduce your energy use and therefore your energy cost which is going to give you more money to do the things that you really want to do. In the absence of being able to really say that, it definitely negatively effects the participation rates. So that's been a key challenge that maybe we'll talk more about.

And then the third piece of our program -- well, let me back up to say that although the direct install piece was taken away, we do -- we are still working on LED generation. So we're working on the outreach and the educational components that we -- that I talked about briefly a minute ago, up to the point of contracting for actual installation.

And then that leads me to the third piece that we're quite proud of which is we have an entity called the Climate Adaptation and Mitigation Partnership that does -- right now has over 35 members of nonprofit agencies of local businesses and local governments that are coming together to share best practices, to share ideas, to ask questions, and just learn more about the benefits that they can -- that they can achieve through energy efficiency programs.

Thanks.

MS. DERRY: And in Happy Camp where I live, we're so far removed from Sacramento. We're six hours north of here, so it's way up in the middle of nowhere. We're 75 miles from the nearest community, there's about 1100 people in the community that I live. We're surrounded by natural forest.

So one of the things -- and working with the tribal government is a lot different than working with a state government or a community or like a mayor or whatever, you have an entire tribal council that you have to work with. So sometimes that can get a little difficult, but we work through it.

And one of the things that we have most recently done is completed a biomass feasibility study with the Schatz Energy Research Center. They did that for us and so right now we submitted a grant for Phase II and one of the things that we're looking at with the biomass feasibility since we are surrounded by natural forest, and there's been no forest cleanup since 1994 and it's really poised for destruction with catastrophic wildfires as other communities have experienced.

So one of the goals is with our biomass is to one, clean up the forest and make it less hazardous to provide green energy through -- for several -- the project that we're looking at goes across a river and then there's tribal property across the highway so they have deemed it contiguous

so we would be able to provide green energy for the elders' housings -- housing that is up there, a head start building, and several administration offices. And that would be one of the first steps that the tribe has taken to do green energy.

They've done -- the tribe is doing a lot of -- it's called treks and they have people come from all over the world to do their treks burning projects to thin the forest and make it more -- like what used to be done 100 years ago that tribes used to do.

So with that green energy, one of the things that we are looking at is not only -- it would provide the minimum of three jobs for community members which in a community of 1100 people, that's huge. Those dollars circulating in that community would be just a huge boon for the community.

One of the things we've added is to have a scale that somebody can bring a trailer and their vehicle or whatever, get their vehicle weighed, and then they can go out. When they go out and cut wood, they can bring stuff back in and be paid for it on the spot. So that's one of the things that we kind of want to incorporate in order to kind of help our community because there is no -- we have government, we have the forest service, we have the schools, and we a small, you know, a grocery store and the tribe and that's pretty much our income for the entire community.

So when we think of green energy, we have to think of

how can we support the community as far as jobs, as far as getting more money in to the community so that's one of the things that we were working on.

So our second phase of the grant has been submitted and we're waiting to hear on that one and that one is for a solar feasibility study as well as Phase II of the biomass marketing plan and a business plan. So hopefully that will be done within the next two months and we'll be able to move forward on that one.

We are also looking at -- the tribe recently completed a casino in Yreka, California which is 75 miles north of us and so we're looking at solar for that to reduce the footprint of that on the electric -- the electrical system out in that area.

And our main goal for the -- for our community is to have our community self-sufficient with green energy in the future. Because being where we're located at, there's only 1100 people we know that if there's -- the subduction earthquake ever happens, that we're going to be one of the last that's ever say oh, yeah, we forgot about these guys but here we go. So we want to have some self-sufficiency done before that occurs so that our community's going to be okay.

And one of the examples that we look at is Blue Lake down by Arcata. Jana Ganion and with the Blue Lake Rancheria has done with all of their energy efficiency measures. And

they are -- they set such a high standard that it's really nice to see what they're doing and to follow in their footsteps. And Jana and I talk a lot so. Being as I'm new to all this so she's been a huge help and that's kind of what we're working on in that area.

MR. SAMUELSON: Thank you.

Michael, did you have any --

MR. WINKLER: Can you hear me?

MR. SAMUELSON: Yes.

MR. WINKLER: This is Michael Winkler.

MR. SAMUELSON: Yes, Michael.

MR. WINKLER: All right. I'm wearing three hats in the energy field. The first is as a member of the Arcata City Council, I'm currently the vice mayor, previously the mayor. The second hat that I wear is as chair of the board Redwood Coast Energy Authority, which for the last two years it's operated between choice energy program for Humboldt County. And then my day job is as a partner in an energy consultant firm call Redwood Energy which has operated for about 12 years and works on large affordable housing projects throughout California.

In Arcata we had a very large problem up until about 2009, approximately 15 percent of our apartments and homes were used for large-scale indoor marijuana growing. And even though we had made major efforts to become energy efficient

and we have a very -- community that's dedicated to stable energy, our energy use was going up. And so I took a lead role in what we call the high energy use tax which put a 45 percent tax on the electricity used above a certain threshold. And that was enacted in 2012 and since then we've had a 98 percent reduction in households that are -- this very high energy which we assume was in-home marijuana growing.

So it went from around 1250 now we're down to about 25. We've almost eliminated the problem -- freed up -- so we've now freed up 1200 household, apartments and houses who had previously were being used for cannabis growing and this has also made neighborhoods safer. And when the tax first went in to effect, we were making about $200,000 a year which we applied partially to energy efficiency programs. We're now down to about 100,000 a year for those remaining 25 households so that's still helping fund energy efficiency programs. At the county level we enacted the community choice energy program which gave us local control, allowed us to keep more money in the community, and reduce the environmental impact of energy use.

At the beginning of this year, Arcata enacted a reach code which now requires that on new construction, that single family homes be 30 percent more efficient than the Title 24 Code, and multifamily be 20 percent be more efficient.

We did a streetlight retrofit program throughout the city. We started to electrify city buildings where in the near future going to put heat pumps to replace the natural gas furnaces in Arcata. Doing the same thing for the city library. And we have a -- we're committing long term to 100 percent of the new construction and large retrofits in the city being renewable and we're buying 100 percent renewable energy option from our community choice energy program.

And both in Arcata and throughout the county we've had substantial number of large affordable housing projects and I've been in a dual role on those. When they've been in Arcata, not only has the city of Arcata been involved but I've been doing pro bono work on the ones in Arcata to avoid any conflicts of interest. So I've been the CEA for these projects, I've also been the field tester for these projects in Arcata.

And then long term the -- although our work for that is not on electrification, the city has tentatively adopted a goal to phase out natural gas in Arcata first with the municipal buildings and then long term to require that new construction be electric only hopefully starting beginning of next year. And then long term doing a 15-year phase out of natural gas in the city of Arcata.

And then finally, electrification may be thought of

just as a switching to renewable energy but it turns out that burning natural gas for space heating and water heating is very inefficient. So even if we were using fossil fuels in generating electricity, it's much more efficient to burn the fossil fuel in the electric plant than to use the heat pump for space heating and water heating rather than burning it directly.

And then finally, with Redwood Coast Energy Authority, our director of demand site resources, Lou Jacobson, will be out of town later in the day will be talking more about their energy efficiency programs. But RCEA operates an energy efficiency program that -- that's happened. And another we're aware is PG&E is starting to take that away from our local entities and we're looking in to the possibility of forming what is called the rural renewable energy network similar to BayREN which is operated in the San Francisco Bay area so that we in Humboldt County and other rural counties can take control of those programs and use them for our local benefit.

Thank you.

MR. SAMUELSON: Okay. Thank you.

We'll move on to question number two. And question number two will have three follow-up questions. So how do those initiatives that we just discussed address energy efficiency?

MS. DERRY: The biomass plant that we're talking about, right now the tribe has -- one building has thermal -- geothermal that they utilize for heating and cooling so it stays at a pretty constant temperature. Some of the housing units have solar but not all. There's 243 housing units, not all of them have solar. The goal is to get them all retrofitted with solar.

And in -- there's three different locations that the tribe has in Yreka, Happy Camp, and Orleans. So the distance from Happy Camp to Orleans is 40-some miles, and then 75 to Yreka. So trying to incorporate all of that, we're working on coming up with a tribal energy plan which is on our strategic energy plan which we will be doing this year.

And as a community in Happy Camp, one of the other things that we're working on real quick is just -- in fact, the meeting's this week is a fire emergency plan -- a community emergency plan that hasn't had -- occurred before. Because like in other communities there, everybody's pretty independent so trying to get everybody together is sometimes a nightmare.

So the energy efficiency would be the -- generating the electricity and a byproduct of the biomass is the biochar and the biobricks that we're going to be working on also.

So instead of burning wood, you know, going burning -- cutting wood or whatever, you'd have these little

bricks that you would be able to utilize a lot less wood and just use the bricks as a byproduct of the biomass. So that's kind of what we're working on right now.

MS. TIMMER: This is Kerri Timmer with Sierra Business Council.

Our program is largely what's called a nonresource program, especially once the direct install piece was taken away. So I think generally our efforts are geared toward education as I talked about earlier and the planning that goes into identifying potential projects for the future.

This year 2019 will be our first year that we will not be doing the direct install ourselves but instead will be working with our community partners. It's also the first year that we'll be doing -- focusing on municipal as opposed to what we used to do which is small, medium sized business.

So we have a very steep learning curve to try to make some progress in 2019 but our primary goals really are the educational component, making sure that our municipal governments understand the benefits, what they can get from participating and actually launching projects, our services that we can help provide as project managers, and liaison with the actual installers.

And then, you know, just generally raising awareness about why this is important. As well, for our communities as well as I think raising awareness at the state level as to

the importance of ensuring these programs continue in our rural and hard to reach areas. It's real easy to say that, you know, the co -- if you look at just cost effectiveness, we're tanked because we can't. It takes me, you know, two hours to drive to a community where we might do a greenhouse gas inventory or try to generate some project interest. It -- we cannot meet the same kind of cost effectiveness test that urban -- urban projects can. And I'm sure Karen feels --

MS. DERRY: Yeah.

MS. TIMMER: -- that pain as well and Michael too.

So, you know, we need to educate the state regulators and lawmakers as to the nonenergy benefits as well. And also to be honest, in terms of equity, everybody in the state or in these areas is paying in to the public goods charge. And although cost effectiveness is the metric, I personally believe that equity in access to these programs, access to the benefits that the programs can offer for our businesses, governments, and residents is critical. And we can't just leave these rural areas aside because we can't make the work cost effective.

So we either need to change the metrics or have a different set of metrics or subset of metrics for these areas, certainly need to account for the nonenergy benefits. And our communities want to be part of the solution too. We

don't want to be second-class citizens. You know, the Governor said it, it's all for one, California is one state and we all need to both receive the benefit but also contribute to the solution.

MR. WINKLER: As far as the benefits disadvantaged communities it -- one of the first projects I worked on locally is called Plaza Point in downtown Arcata. And many of the residents in that project had zero or even negative energy bills in which they get money back from PG&E or from our local CCE. And they also have those that are stable that because we have no natural gas in this and a number of projects, they have better indoor air quality. Unvented gas stoves which is the norm produced substantial amounts of carbon monoxide, nitrous oxides, and even formaldehyde.

And another important thing is that we have demonstrated that these all electric, all solar projects are cost effective and actually more cost effective for builders than projects that use natural gas. So projects that might not be -- cost a lot for builders actually can be built because of these lower costs.

And longer term -- we would also like to switch people from what still applies for a use of woodstoves in Arcata and in Humboldt County that this is most inefficient and a major source of air pollution.

And even if this wood is being burned, it's much more

efficient than -- much easier to control pollution if this is being burned in [indiscernible] power plant which we have two of in Humboldt County.

And another area that we can work on and the -- in my private business we're starting to work on is energy efficiency retrofits for existing affordable housing projects. We have a large number of those in Humboldt County and that's something that we will be focusing on longer term of giving major top to bottom retrofits of these affordable housing projects here in Humboldt County.

And then finally, and although this isn't energy efficiency, Humboldt County is on the verge of producing all our electricity from local renewable energy sources, currently about 25 percent of our electricity comes from biomass plants. Longer term we're working on very large on and off for wind turbine projects that could potentially make us self-sufficient in energy and make us exporter -- net exporters of electricity in Humboldt County.

MR. SAMUELSON: All right. Thank you.

I'll go on with the first follow-up question. How do they benefit low-income or disadvantaged communities through energy efficiency or by other means?

MS. TIMMER: Do we want to let Michael go first?

MR. WINKLER: All right. As I mentioned before that indoor air quality is a major issue that I think that people

in low-income households often are underserved as far as health services and may be have higher incidences of asthma or other respiratory diseases. So having an all-electric kitchen could potentially -- or being able to move away from a woodstove to an electric heat pump would provide in probably a fast way could improve indoor air quality and lower incidents of some of these respiratory diseases.

And also being able to have lower energy bills can make it so that people have more money for other things that there are a necessity. I mean, if somebody is skimping on being able to afford necessary prescriptions or healthcare by spending less money on energy, they can spend more money on these other necessities.

MS. TIMMER: And this is Kerri again, I'll go next just because I'm basically going to say ditto to what Michael said. We have a lot of similar issues around wood smoke, wood heated households and so on.

You know, and certainly through our outreach and education programs and our planning activities with energy action plans, these are the kinds of issues that we're addressing.

And then also the biomass issue and for us as well as I think for everybody on this panel, the wildfire danger is obviously top of mind across all agencies, across all residence of this state for the most part. And anything we

can do to make forest treatment, fuel reduction kind of treatment more economically viable, you know, short of clearcutting to feed the beast, so to speak, is critical. So that is another piece that we're working on also trying to get it -- trying not to lose the infrastructure we already have. I mean, how stupid would that be. We have these facilities already there, already permitted, already existing in communities that either love them or at a minimum have grown to accept them. And I'm talking forest biomass now. I know that the valley agriculture biomass is a whole different ballgame. But in terms of reducing wildfire danger, it would be criminal, I think, if we were to allow the existing infrastructure to die on the vine.

So anything -- I know we get to this question later about what the state can do, but anything to help maintain, retain, and make viable the existing facilities we have for all of the reasons we've talked about energy and nonenergy benefits, that's going to help these -- the low-income and disadvantaged communities in my region which is the largely rural forested parts of the state.

MS. DERRY: And in our communities since we're just starting out with renewable anything, everybody in Orleans, the power still goes out for two weeks at a time so everybody has generators. So one of the goals we have for that community is to have similar to what Blue Lake has, is a mini

grid that will supply power to the community because their power still, it doesn't matter if it's winter, summer, fall, their power goes out for a minimum at a week at a time, and at most it's at two weeks.

So everybody is set up in that community where they -- they now have PG&E brings in a huge community generator that will supply to the community but it's still burning fossil fuel. So our goal is to get the mini grid there.

And in Happy Camp, our power we're kind of fortunate where we're located at, we have power come from one source coming in down the river and from another source coming over from Oregon into Happy Camp because we have Pacific Power.

But on the second hand, they don't care about Happy Camp because we're one of the only few places in California that they provide power in our area.

So our goal for both communities there is to have our communities have our own tribal utility company and then to have us supply the power to our communities so that we have more control over it.

And another thing that we're working on since we have such a distance to drive, and I've been trying to find where we can get funding for EV stations, one in Orleans, one in Happy Camp because they're putting some in Yreka already, but we -- there's no fill in for the other two locations. And

the tribe has a fleet of probably 150 vehicles and I've already gotten a commitment from the tribe that if we were able to get those stations in, they would start replacing their cars. So going 75 miles on an electric vehicle versus a -- one with fossil fuel would make a huge difference.

So those are some of the things that we're hoping will make a difference in our community and they will benefit everybody if they don't have such a huge power bill coming in in the wintertime. So.

And everybody's systems -- the homes -- somebody talked earlier about the homes -- their homes are 30 to 50 years old. Ours are much older than that, there's -- a lot of them have no insulation. So, there's just a lot of infrastructure that needs to happen in our community and that's one of the big things that we're going to be working on in the next ten years to get everybody set in our community.

MR. SAMUELSON: Okay. Thank you.

The next follow-up question. How do they address the needs or concerns of the most impacted by environmental hazards, such as air pollution?

MS. DERRY: And I can start with that one. Our community -- where we are up north, everybody considers that we don't have any air pollutions because of where we are, you know, we're not Sacramento, we're not LA, our air is really

clean. But it's not going to stay that way if we don't do some changes.

So we're kind of located in a valley, in a canyon I guess it is, not even a valley, there's no flat spots anywhere so we're kind of in a canyon. So, in the wintertime, some of it hangs in there and then during the -- when it gets light, then it goes away. But still, the people that live in those communities consider that we don't have air pollution. But those of us that know -- we know better and we want to make it better for those that are living there.

So some of those things that I had talked about such as the electric cars or the EV charging stations and the solar and everything, instead of relying on the woodstoves and stuff will make it much better then what it is already.

MS. TIMMER: Yeah, this is Kerri. We have that same situation and actually there are some parts of the Sierra also I think suffer from this perception that everything is pristine and wonderful and many days it is exactly that.

But we get not only incredible air quality problems with wildfires that are more prevalent, more severe, last longer, burn hotter, and send pollutants up into the air like crazy, but we also get pollution that blows up from the Bay Area, primarily, in Sacramento. And just the community that I live in the county that I live in, Nevada County, often has

the worst air quality in California on a daily basis here and there.

And we don't have the resources to measure as much as other areas have, so there's probably stuff in the air that we're not even aware of because we don't have monitoring stations that tell us what we're breathing every day.

So, yeah, that's -- those are, you know, we can't -- the more we can do to reduce the air pollution in other areas that blows up to our communities and the more we can do to reduce the catastrophic wildfire, we need wildfire to some degree for forest management, but the more we can do to reduce the catastrophic nature of the wildfires that we're seeing, the better our communities will be.

MR. WINKLER: In our area the -- probably not something that people are aware of but the greatest exposure to air pollution is actually indoors rather than outdoors. And a lot of these times this is coming from things that people are producing themselves with -- whether they're using gas stoves, whether they're using woodstoves, or even burning candles or burning cannabis.

And so, one thing that I found as a HERS rater is that so far in Humboldt County that compliance with Title 24 Standards for HERS testing have not been consistently applied. So what we're starting to do is work with local building departments through Redwood Coast Energy Authority

to educate building departments and also educate builders so that these state standards which are excellent standards that are going to get even tighter will actually -- going to be enforced and the HERS raters are going to go out there and confirm that the range hoods and the ventilation fans are working.

What I found in my HERS practice is that probably 75-plus percent of the time when I initially test ventilation systems, they are not meeting the state standards. So it's important that we get the HERS raters out there, the building departments and the builders work with us and that people get the clean indoor air that they are legally entitled to and they need for their health and the health of their children.

MR. SAMUELSON: Okay. Thank you.

The third follow-up question is what long-term energy efficiency goals are you hoping to achieve?

MS. TIMMER: I guess I can go ahead and start on that. We have three and I think I've mention them briefly already. First is to help communities plan for how they can identify and implement and achieve energy efficiency goals in their communities.

And although renewables in and of themselves are not directly tied to efficiency, I think the more that we can do to achieve energy efficiency goals in our communities, the easier it will become to then start meeting the renewable

portfolio goals by just reducing the amount of energy that needs to be produced and then it makes it easier to use renewables for what's remaining.

So, that's another key piece of our outreach in education is working with communities who are interested in discussing 100 percent renewable goals.

And then our third and in my mind sometimes most important goal really is to ensure that our communities, as we talked about earlier, are part of the solution and not ignored by or, you know, based on metrics and methodologies not allowed to participate in these programs and receive the benefits.

MR. WINKLER: As Kerri and Karen had mentioned, it's a -- especially in the cap parts of our county that are more rural or in their communities that are inherently rural, it's hard for us to serve these communities, so I think it's important for our community and these other communities to take that control of our energy efficiency dollars and I think work with each other potentially through this rural run to create programs that can serve rural areas better than outside companies can do.

And the other one is to allow energy efficiency funding to be used for electrification. Currently these -- if money is collected from a fee on natural gas, it can't be used for electrification.

And then one advantage that we have by having these large affordable housing projects is that we can do large scale retrofits and that's something that I mentioned that we would like to concentrate more on because it's easier to do a large project all at one time than it is to do individual homes or individual condominiums. So that's where one of our focuses is going to be long term.

MS. DERRY: And where we are, one of the challenges that we have first is education. We have a lot of -- an aging community and they've always done it like this and that's how we're going to stay.

So, one of the things that were going to need to do is education. And then the other -- there are a lot of people that would love to go to solar but to find someone to come to Happy Camp to do that or even to provide an estimate is next to impossible.

There's challenges even getting a contractor to do any building in Happy Camp because it's so far from anywhere. So a lot of homes in Happy Camp have been built by the owners without permits, a lot of add ons have been done without permits. A lot of times it was very difficult to even get somebody from the county to come down and do an inspection.

So, we've been dealing with all of that and so a lot of it is just going to be education both at the county level, at the state level, and at the tribal and community level.

So, that's -- that's one of the things that we're working on. And that's our long-term goal is to get the community educated and then everyone else so that we can get the services to the rural -- extremely rural areas to make things better for folks.

MR. SAMUELSON: Thank you.

Question number 3. 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?

MS. TIMMER: Michael, do you want to start? I bet you have the most to say on this one.

MR. WINKLER: All right, then. As I mentioned, we adopted a reach code that under state regulations did -- it has to -- to be able to adopt a reach code, the code has to be shown to be cost effective and we used one of the cost effectiveness studies that was done by the state to show that our ordinance would be effective at these high levels of efficiency that we're going to be requiring them.

There's going to be new version of the energy code that's coming out the first of next year. It's called the 2019 code.

And what we're going to be looking into is -- and what is going to be allowed that we would like to go to all electric, we would like all new construction be all electric.

And what we would need to see is if that is something that we are legally allowed to do, it's something that we are committed to do as a community that -- but we need to see if it -- that's something that's going to be allowed or if we need to work with state regulators to make it so that we can either strongly encourage or legally require that our new reach code be all electric.

MS. TIMMER: And this is Kerri. I guess for us we have a hard enough time getting our local governments to acknowledge that climate change is a thing. So it's even harder as you might image to get them to be at all interested in going beyond whatever the minimum mandatory requirements are as it relates to codes.

So, we don't really currently have an active program along those lines, although we do hope to start working on some reach code education at least this year in 2019. We do provide benchmarking services, though, to public agencies and had been doing that with small, medium sized businesses in order to identify opportunities for potential energy efficiency programs.

And then, you know, we have done benchmarking and greenhouse gas accounting that has helped with some of the other goals that we have that are not always necessarily energy related. But we were able to be part of a project that brought $18 million of funding in for affordable

housing, sustainable communities, housing transportation project in Truckee. We helped -- our benchmarking and accounting helped the Truckee Donner Public Utilities District fuel switch from coal to renewable energy.

And then even back in 2014, we worked with, this was a fun one, the U.S. Alpine Championship Competition to help them be -- have their event be carbon neutral.

So, you know, again it's just -- it's any opportunity to educate, think outside the box, approach people who, you know, might not be your typical cast of characters and something that visible especially in our region the Alpine Championship event, a lot of people paid attention to that. So it's really the education outreach component that works best for us.

MS. DERRY: And where we are Happy Camp is unincorporated as is Orleans. The only incorporated community that we work with is Yreka and being new to this, I have no idea if we have anything, to be honest. I really don't have a clue.

MR. SAMUELSON: Thank you.

Question number 4. What advice would you give to local governments seeking to do more related to energy efficiency?

MS. DERRY: I can start with that one. Mine advice is to just follow through. Is to do something. Don't --

don't sit and talk about it forever and do absolutely nothing but just to start, to at least start. Follow through, talk is cheap unless you have action behind it, there's nothing is going to get done.

There's a lot of free resources we have gotten technical assistance from. NREL. We're working with the Department of Energy, Office of Indian Energy on a few things. So, mine is just take action, don't just talk about it as a community or as an organization or whatever, just follow through, do something, take action.

MS. TIMMER: Well, this is Kerri. I'd say on -- in addition to those things a couple other ideas, one is, you know, reach out to your -- your providers, reach out to your energy watch organizations and find out what we -- what kind of services we can offer you if you are interested.

Become a CivicSpark local partner program. You know, I don't know if you guys are familiar with CivicSpark. It's a great program. It just sort of grew out of the Americorps concept where you've got a young person coming out of undergrad or grad school wanting to gain some experience in the field. For a really quite minimal investment of time, you get this person's expertise and energy and passion for 11 months. And they -- in our experience at SBC, Sierra Business Council, they have been huge catalysts for helping the community understand the benefit.

And then also in communities where we've already done perhaps an energy action plan, the CivicSpark member or fellow manages and facilitates the community sort of advisory group that grew up as part of that energy action plan process and is now helping the -- with the implementation of that plan. So we go beyond just something on paper and the CivicSpark fellows are really helping communities do -- get to the point of doing the work on the ground.

And then just -- this is a much more sort of, I don't know, detail -- level of detail that may or may not be of interest, but just be aware that there can be a loading order for projects. So you might get excited about doing a full building retrofit, you know, maybe replacing your HVAC system and you jump full force into that. You do all your planning and, you know, you get that all lined up. But in the meantime, you miss an opportunity to first do some of the individual kind of measures like replacing your windows or other things that would have brought your overall energy use down and therefore would, you know, would have allowed you to not have quite as robust as a new HVAC system.

So just, you know, that's just an example, but think through the ramifications of what you're trying to achieve in the end and sort of back it up to see if there's anything you can do first that will, you know, lessen the impact of the bigger project that you have in mind.

MR. WINKLER: This is Michael. I would say try to find creative ways of raising funds, of course legal. But pass the high energy use tax, as I mentioned earlier, has provided somewhere between $500,000 and a $1 million for city energy programs in Arcata that while getting rid of the cannabis grow houses and encouraging people to do things legally which they are doing quite a bit in Arcata now.

I would say focus on new construction where it's easier to do it. Affordable housing, there's a lot of money available to do that, city or municipal facilities, and commercial lighting.

One thing with -- I'm not sure about is that since Redwood Coast Energy Authority operates throughout Humboldt County, I don't know if it's possible that Redwood Coast Energy Authority could cooperate with the tribes within Humboldt County to help with tribal energy development.

Redwood Energy, the private consulting firm that I'm a partner in, has worked with the Bear River Band of Rohnerville Rancheria to put together a tribal energy sovereignty plan that -- Bear River Band's goal is to become completely self-sufficient in energy and for every month of the year to be -- to produce all of its own energy on property that the Bear River Band owns.

And so we're open and I think the Redwood Coast Energy Authority, the kind of energy agency is open to

looking in to working with tribes on issues with helping tribal members and the tribes themselves become more self-sufficient and efficient and be able to use energy in ways that are more helpful, and can meet within the financial limits of the tribe.

MR. SAMUELSON: Okay. Thank you.

Question number 5. What have been your main challenges in rolling out those initiatives? And how do these challenges differ from building sectors?

MS. TIMMER: Michael, do you want a shot at that one first?

MR. WINKLER: Sure. Let's see. Private residential is a lot more challenging because you have what's called split incentives where the -- in rental housing, the builder paid by the tenants in general, and that energy efficiency measures would have to be done by the private building owners. Or in individual single family homes, it's also challenging because it's very time and labor intensive to reach these homes one at a time. We had the direct install which as other people mentioned is being cut back or funding is being eliminated.

And so -- and it's especially difficult in rural areas because these are far apart and there's a lot of travel time and so that's been one of the challenges that's existed for us, too, here in Humboldt County.

MS. DERRY: Yeah. And along with what Michael's saying, the challenge is funding. And of course the bureaucracy is always a challenge. Because at a tribal level, we have the Community Development Corporation, we have our board and then of course it has to go to council. So you have to get approved here, and then you have to get it approved here, and then it has go to -- if we're applying for a grant. So it's just a slow, long process.

And working with the state -- a tribe working with a state is always difficult because of tribal sovereignty. So we have that huge issue of which we have no control over but the tribal council has to say, okay, you can't do this because of tribal sovereignty so you have to take this out. So it's just a long drawn out process with the extra step because of tribal sovereignty.

And again, the funding, as what Michael said, is always a huge issue because of where we live and the amount of people that we can serve versus the amount that a larger community can serve. So it usually, if it's based on numbers, it'll go -- always go to the larger community than the smaller one.

MS. TIMMER: And then for us in the Sierra, if you take that set of issues and multiply it by 11 counties and the different cities and communities within those 11 counties and the distance that it takes to, you know, to be out there

on the ground in all of those counties, that's probably our biggest issue. And yet, you know, if we left it just to the individual local governments the way some of the other programs operate, there -- nothing would get done. So, it's this push me, pull you. No offense but, you know, they need prodding most of the time and education and, you know, somebody who's kind of a champion to lead the effort and that's largely our role.

So some of the challenges related to that is just lack of staff capacity at the local government level. It takes a tremendous amount of outreach effort to get a local -- to help a local government understand what its role in -- for example, an energy action plan would be and, you know, how much of the service we are going to provide versus how much of the time and energy of staff is going to be needed.

This will sort of lead us in to one of the challenges that we hope maybe the state can help with and that is access to data. So, you know, we can only, how do I say, we can only prove and provide benefit if we have data going in and can say here's how we can help you. If we go in to say and instead say, you know, we're here and we want to help you but we need you to go find your data and we need you to tell us what your previous energy efficiency actions have been, you know, talk to the hand, I mean, there's just, that's a

nonstarter.

And so anything we can do to make data accessible to those of us who are the providers. Anything we can do to minimize the kind of ever changing program components. I mean, we could go in on a Monday and say, you know, we can offer you these measures and you'll receive these savings and you'll get this kind of incentive payment and then, you know, because it takes time for a government entity to reach a decision, we come back three weeks later and in the meantime, an agency or our utility has changed the measures that are eligible for rebate or incentive. Now we have to go back in essence start all over again. And again, multiply that in our case by 11 counties and all of the communities within.

So it's not -- it's not for the faint of heart.

MR. SAMUELSON: Thank you.

The final question that we have is what can the state of California and the Energy Commission in particular do to support you in that work?

MS. TIMMER: You don't want me to start.

MS. DERRY: I'll go ahead and start. One of the challenges that we have is staffing. We can get a grant to do the work, we can find funding sometimes to do the work, but we just can't get the funding or find the funding to hire somebody to oversee all that work.

So in starting a utility company that we would

eventually like to start, it's going to be awhile because to get the expertise and to pay them what we need to pay them to come to our communities is never easy. And then once we can get them there, housing is always an issue. So it's -- it just -- finding the funding is always going to be a challenge and we're aware of that. And I'll stop there.

I know. I know. It's just like -- but and then just keeping us informed. Trying finding a good way to keep us informed as to what the state is doing and what's out there, what's offered is always -- is always a challenge also. Because we have so much coming across our desk all the time from every which way and trying to wade through all of that and find out what's applicable to us and what would work for us is always -- always difficult.

MS. TIMMER: Michael, are you going to jump in?

MR. WINKLER: Yes, I will but --

MS. TIMMER: The audience hopes.

MR. WINKLER: Well, one important area that we mentioned that we have before is keeping -- having help from the state in keeping control of energy efficiency funding local. I guess the thought so far has been these larger entities can be more efficient than a bunch local agencies. But we here locally know what our energy efficiency needs are locally and so allowing us to be able to keep that control local is very important to us.

And if we -- and Lou Jacobson from Redwood Coast Energy Authority this afternoon could talk more about that.

The second one is that we're spending a lot of money on energy that we're sending out of the county for energy, for natural gas, for diesel, for gasoline, for propane. And so to allow funding to be shifted to electrification can allow us to become eventually self-sufficient in energy which will keep the money and the jobs in the community. And also, will free up money that we can use for energy efficiency programs.

MS. TIMMER: Really? Okay, I've got this many. I just held up a list. But I recognize that I've mentioned most of them before so I will try to be brief.

Probably first and foremost for us is anything that can be done to amend the way that we approach cost effectiveness and the impact that it has on the ability to do this work, especially in rural hard to reach communities.

Tied up in that is, you know, definitely accounting for the nonenergy cobenefits which Commissioner McAllister mentioned earlier as well.

And just, you know, helping to change the attitude around this so that absolutely cost effectiveness is important and we have, you know, we owe it to the ratepayers to be sure that the work that we're doing has benefit. But just remember that everybody is paying in to this charge. So

all of us are ratepayers and ratepayers in rural areas deserve consideration just like ratepayers in urban areas.

The comments that we made about biomass and anything that can be done to help retain biomass both for value added products as well as energy, to maintain that as a renewable energy source, to allow for that to help us with some of the other problems that we have in the state in the face of what I know is some opposition around biomass in both forested areas and agricultural areas. If we lose that tool, my communities are done and I think the other two panelists as well.

Retaining local control through the ability to apply to be a rural energy network -- or regional energy network, rather, or CCA. I think it's critical that we have all the tools in the toolbox. We can deal with some of the concerns about overlap and other things but we need to have that ability particularly in some of the geographic hard to reach areas.

Better access to data on local government energy use and energy efficiency program participation. Just as an example, special districts are a new target for us in the municipal sector and our local utility PG&E doesn't have data on special districts. So once again, we're faced with going to a potential customer and saying we can help you but you have to help us first and that's not the best marketing

message.

Breaking down the barriers between programs so that outreach and implementation, you know, can be a more holistic exercise and not so siloed into these different program areas.

And I'll stop there. There's more, I'll put them in writing. But thank you for the opportunity to even have this conversation.

MR. SAMUELSON: Well, thank you. We do want to open up the time for questions from the public. If anyone has a question to please come up where the mic is so we can have it recorded and heard on a Webex. Do we have anyone?

And it looks like we don't have anyone so I just want to take the opportunity to thank Karen and -- oh. Okay.

COMMISSIONER MCALLISTER: So mostly I want to just to the opportunity to thank all of you.

I think this rural question is really difficult because the, you know, the cost and the sort of cost effectiveness regime is -- it's a barrier everywhere but it's even more a barrier where costs are kind of inherently higher, right.

So, I wanted to point out a couple of things and really by way of just inviting you to continue to think about these issues and submit comments and advice to us throughout the course of this effort over the next few months.

So I really want to endorse the CivicSpark plug because that's a great, great program and its -- they have several hundred young people coming into the state every year -- or you know, graduating and looking for interesting things to do. And they're energetic, they're idealistic, and they really want to help. And they want to know about local government, many of them. So that's where they see a career path and we can encourage that.

I wanted to point out that -- so, Michael you mentioned, you know, the electrification pathway. So there is this bill that's being implemented AB1477 -- SB1477, rather, Henry Stern's bill that actually takes some gas company money -- gas utility money and dedicates it to electrification. It's $200 million over -- over the next four years across the state. So in the IOU service territories, I believe.

But it's prompting a lot of discussion about decarbonization and the electrification pathway and so I would advise there are several rulemakings you can -- staff can sort of orient you hopefully about that. But that's a place where your opinions would be really helpful because it's actually a different kind of beast than the efficiency programs have been to date. Because it allows that cross spending and it's going to produce a lot of learning that I think will open up pathways for being more -- more

circumspect about how we utilize those monies.

So let me see -- so and just by the way, you know, the agency that establishes the cost effectiveness rules for the most part is not the Energy Commission, it's the Public Utilities Commission. And so they have been -- they continually think about cost effectiveness. And, you know, it's kind of to the point where, you know, they have an obligation to protect ratepayer money, kind of above and beyond everything else. And so, you know, those cost effectiveness rules come from a particular place which I'm not going to sort of pass judgement on but I'm going to just say that it does make it difficult to justify using them on many, many projects that would help us reach our goals, you know, statewide.

So there is another program actually that's run -- and Michael, I'm wondering if you have some experience with this. I know -- I was talking with Nick before about the LIWP program that they're using here in Redding. And that's run by -- it's the Low-Income Weatherization Program, it's run by the Department of Community Services and Development. And it does not have those same constraints around cost effectiveness, they can do integrated projects, they have done electrification. And obviously, they don't have enough money and it's federal money and, you know, they combine it somewhat with some cap and trade funds. But that's actually

a pathway that I think presents a model that we can build upon, that doesn't have a lot of these constraints that -- on cost effectiveness.

Anyway, so those were just some comments I had. And then I also wanted to say, we're doing a lot of data and would love to work with you all on that. We have a -- we're building a data team at the Energy Commission. We're getting all the utilities data so it's, you know, the goal being that the Commission can be a go-to place for some of this information that local governments might need for planning, whatever kind of planning, whether it's climate planning or just resilience planning or things like that.

So, you know, it's going to take another year or two I would say but it's a really positive thing that we're putting together. So heads up on that.

So let's see. I guess if I -- so I would like to hear if Michael you're using the CSD program and if that's something that your -- sort of describe that for the rest of us.

And then also I have a question for all three of you. You mentioned the Schatz biomass stuff that you're doing. I think that's great. And I'm wondering how much partnership you're developing with universities to kind of find solutions, you know, through that channel. Because they do have some resources, you know, they also have some

constraints but I guess I'm wondering how much you've looked into partnering with universities to build some of this knowledge base.

MR. WINKLER: I'll go ahead on that. As Brian mentioned that I worked for Schatz Energy Research Center for about 12 years both while I was a student at Humboldt State and after I graduated. And so Redwood Coast Energy Authority continues to have joint contracts with Schatz Energy Research Center, we've had many over the years. And I believe we're also involved in the -- I think we're involved in the biomass study, too, because we're a major purchaser of biomass electricity.

In my private business, Redwood Energy, that our focus for funding has been through the -- let's see, the California and utility allowance calculator which is used to set utility allowance and utility rates for things -- affordable housing projects so that -- we haven't participated in the LIWP program so far and I'm aware of its existence, but I just don't understand it in depth yet and it's something that we could look in to.

And CSD -- you were mentioning, Mr. McAllister, could you say more about that? I'm not familiar with that.

COMMISSIONER MCALLISTER: Sorry, I had to come back up to the mic.

Yes. So it's -- they actually -- they are the

administrator of the Federal Low-Income Weatherization program in California. So that's -- it's -- it's actually not the Energy Commission that administers the low-income, it's the Department of Community Services and Development. So they've taken cap and trade funds and combined them with these federal funds and done some really great projects in multifamily largely, retrofit, I think mostly retrofit.

But it seems like it sort of fits your model and, you know, can be an additional set of resources. And it has no prohibition against electrification. It's, you know, it's very -- it's more flexible than the investor and utility money.

Although, you know, your point's taken about trying to localize those utility funds as well. But CSD could be something you could look into.

MS. TIMMER: And this is Kerri. I would just say that we have not had the opportunity or pleasure of working in the residential sector yet so, that has not -- that program has not come on our radar. But certainly, worth looking into.

And then as it relates to working with universities on biomass, yes, we certainly are, there's a number of efforts underway. There's an advanced wood products working group that I think is part of the CalFire sponsored forest something, something work group. I mean, there's just --

there's a hierarchy you need a chart to understand, you know, to understand how they all fit together. But there is a fair amount of work being done on advanced wood products and also that incorporates university participation.

And then just one example for us in our region. We, Sierra Business Council, are working on sort of reinvigorating the Loyalton biomass facility -- I'm drawing a blank on the town that it is in -- well, it's in Loyalton but anyway it doesn't matter. There's -- we're trying to build the concept of a full wood campus so that it's not just about the energy because that's not always the highest and best use obviously of wood products, but there is a need for that as well so what can we do with the biochar, what can we do with, you know, some other value added products even post -- post and poles and things like that.

And we have also worked with UC Berkeley and UC Merced on some of the data to try to support the air quality and other benefits of burning this kind of material in a controlled biomass facility that's up to date on its permits and so on versus either open pile burning or just even in some cases leaving it in the forest.

So there's quite a lot of work taking place to try to provide justification in that -- for the outreach and education efforts around forest biomass in particular.

MS. DERRY: And we just continue our relationship

with the Humboldt State and the Schatz Energy. We work very closely with them so.

COMMISSIONER MCALLISTER: Great. I'm done.

MR. SAMUELSON: Okay. All right. Just wanted to take the time to thank Kerri, Karen, and Michael for taking your time and your talents and bring it here to share with us. Yeah. That is the end of Panel 1.

MR. KENNEY: Okay. So that will conclude the first panel.

We're going to break now for lunch. So we will be breaking for an hour. So it's 11:56, so we'll repick up at 12:56.

[Off the record at 11:56 a.m.]

[On the record at 1:01 p.m.]

MR. KENNEY: So we're going to resume the workshop here for folks online and in the room. Just want to give a thank you for Redwood Electric Utility for a nice lunch and for the facilities.

So we're beginning this afternoon portion with Building Decarbonization Opportunities and Challenges. And I'll be heading it over to our moderator for that panel, Eddie Rosales.

MR. ROSALES: Hi, good afternoon. Thanks everyone. Yeah, thanks for Redwood Energy for letting us use the facility.

So we're going to move on to Panel 2 right now. We're going to be discussing building decarbonization. And we got two of our three panelists experts here. We are down one panelist today. I'm sure they're running late but we're going to go ahead and get started with the panel anyway. The two panelists to my left, going to introduce them one time.

Richard Oberg, he's from SMUD. And Richard's a program manager who works on distributing energy resource programs. He also works on demand response, storage, and EVs. Welcome, Richard.

Cheri Chastain?

MS. CHASTAIN: Uh-huh.

MR. ROSALES: Is that right? Cheri Chastain is a sustainability manager at CSU Chico. And so she's going to be telling us about some of her efforts there on campus and even before that on decarbonization.

So welcome to you both.

MS. CHASTAIN: Thank you.

MR. OBERG: Thanks.

MR. ROSALES: Thanks for being here.

So we're going to pick your brain a little bit. Start with some general questions, maybe zero in on something more specific. But feel free to expand and, you know, I might also follow up if I hear you guys say something that's key.

So what actions -- I'll start with you, Richard. And then, Cheri, you can follow.

What actions are you taking to help decarbonize buildings in your local jurisdictions?

MR. OBERG: So our utility is taking a very strong approach toward decarbonization. They've set a goal for 2040 to be net zero for carbon which is pretty aggressive. And so now we're working through the details to make that happen.

On the -- actually on the street for us we have set up incentive programs for residential new construction for retrofit on residential homes. So we put up incentives for induction cooktops, heat pump space heaters, and heat pump water heaters. And we've been doing that now for about a year and a half with some activity. It's a little slow but we're getting started on it.

MR. ROSALES: Okay. Cheri.

MS. CHASTAIN: So full disclosure, I've only been on campus for four months. So still trying to get my feet underneath me but I do have a long history kind of working in this space.

Chico State does have very aggressive climate neutrality goals. Much more aggressive than yours that terrify me a little bit. We have pledged to be climate neutral by 2030 for Scope 1, 2, and 3. So my job basically is to achieve those climate neutrality goals over the next

ten years. Yee haw.

Building decarbonization is obviously going to play a really important role in that. So a couple of things that we're working on and I've got some notes that our energy manager and I talked about before I came. So just kind of get an idea of our campus. So our natural gas system makes up about 24 percent of our overall greenhouse gas inventory. We have a central boiler chiller plant that does all the space heating and cooling for the entire campus. That does include shiny new boilers that we just put in a few years ago. So it's going to be very tricky to navigate over the next ten years having this brand new asset and then trying to at the same time decommission it.

Our electricity load right now makes up about 17 percent of our overall greenhouse gas inventory. So some of the things we're doing. Procurement is going to be really big for us moving forward in how we replace equipment. How we are procuring different things for our campus, specifically with regard to space heating and domestic hot water use. So procurement is one avenue that we're working towards.

Curriculum. Curriculum is an interesting one, you know, working on a college campus. For example, one day last week, our boiler plant was running for one building on our campus who happened to have one chemistry lab that needed

steam for their experiments. So our entire boiler plant was really running for one class.

So, you know, I actually heard last week from that department that they're reevaluating their curriculum in how they're going to teach these chemistry experiments moving forward. So hopefully we can -- our plan -- Jason, I'll refer to him, he's our energy manager. Our plan is to wean the steam is our plan. So we are working to in any way that we can wean the steam of our campus needs.

MR. ROSALES: Thank you.

Richard, I'm going to come back to you for the next follow up. So SMUD's an electric utility for the ben --

MR. OBERG: Electric only, yes.

MR. ROSALES: Okay. For the benefit of the folks in the room who might not know that and the folks on the call.

So can you tell us a bit about what projects are best suited to improve decarbonization strategy, how SMUD's viewing them and how they're approaching them on the ground?

MR. OBERG: So we've done quite a bit of research around who our customers are and how they -- how they use their -- meet their energy needs. And it's pretty apparent to us that it's the residential sector that uses the most gas. And so trying to electrify that segment -- oh, I shouldn't use the word electrify. We've decided decarbonization is -- our customers understand that a little

bit better. So.

So to decarbonize our utility, the residential sector is the one that is using the most natural gas. And as we're moving toward more renewable state where we'll have 65 percent renewable and will take care of that -- some part of the carbon, we looked at the residential sector. And residential sector, that's for us that's 550,000 customers which is not an easy task to do over 20 years. But, you know, the major usage there are space heating and water heating. And so as we look at that, that's going to be the sector we're looking to try and impact and we know we can't do it alone. We have to have the local jurisdictions.

We're a municipal utility so we're not connected to the city or the county or anybody. We're -- we have our own electric -- elected board. So we're going to have to work with the county and cities in our jurisdiction to try and help, you know, push toward a decarbonized future. Then we also have to depend on people like the California Energy Commission and the codes and standards set up around that to get us there. So.

While we're looking at that, really the first step we took was to go toward new construction because that -- we don't have to change anything now. We just have to get to them before they build it. And we put together a pretty strong package for our local production builders to, you

know, and we give them offers on different levels. So if they do an all-electric home and they use our community solar program, we pay a certain incentive per site. If they do -- they just wire the home for all the electric so make sure there's wiring for the future electric cooktop or the electric heating, electric water heating, electric vehicles, then we pay them a different incentive. And then also if they -- if they participate on our -- on our community solar, solar shares program.

We've already got houses under construction that are -- that fit that bill. What we'd really like to do is get in before they actually develop the development and before they put in the gas pipeline. Because that infrastructure is costing money and get in ahead of time which we haven't gotten a project yet like that but that's -- that's what we're in right now.

MR. ROSALES: That's interesting. I'm just going quick follow-up on that. Have you gotten feedback from developers talk about the cost ratio of not installing the gas network and the interconnection to the house versus going all electric?

MR. OBERG: So we thought that would be the biggest hurdle. We wanted to make sure that, you know, the developers felt comfortable in selling an all-electric home because that's not been the traditional home in the

Sacramento area. Title 24 Code basically pushed them toward a gas heated, gas water heated home. So as we went out and talked to developers, it started becoming a game of how much money and we came in what we thought was a good cost effective amount for us and the developer said yeah. So I'm not going to have to dig the second trench for the gas line, I'm not going to have to put in the gas infrastructure, and we'll take your money.

So that's where we're at right now. Now that has not happened yet in the real high, you know, the most expensive homes because those customers are still wanting their Wolf range and all that kind of stuff. And it's really about cooking, it's not about water heating or space heating. People don't really -- haven't shown us they care much about how their water's heated or how the -- how the space is heated. But they care about how their, you know, how they make their steaks. So that's been our biggest issue.

MR. ROSALES: Cheri, for you I guess maybe the difference is how are you approaching some of the existing buildings, some of the older buildings that rely on older fuels versus some of the new buildings and maybe buildings in design stage. Can you tell us a little bit about the challenges you're facing there?

MS. CHASTAIN: Yeah. You know, our aging infrastructure is certainly a big barrier for us. The

average age of a building on our campus is 47 years old. We have some buildings that are over 100 years old. So we have a really old infrastructure in a lot of our buildings that again are tied to this central boiler chiller plant.

We are in construction at the moment on a new science building. And particularly excited about the new science building because we're building in a lot of new and innovated things into the building, especially because it's the science building. But a very difficult but purposeful decision that was made was to not connect this new building to the central boiler chiller plant. So, you know, again, we have these brand new shiny boilers and we made the conscious decision not to connect this new building to that plant. You know, and these are -- these are --

[Webex interruption.]

MS. CHASTAIN: Oh, thank you.

You know, so we are making a lot of these decisions as we talk about new construction, but really we have a lot more that needs to be on the renovation side of things. So as we look at renovating existing spaces and older buildings, you know, looking at different specifically space heating options and kind of decoupling those from our -- our main central boiler plant.

MR. ROSALES: I'm going to ask one quick follow up on that.

MS. CHASTAIN: Uh-huh.

MR. ROSALES: So you're in a school setting, obviously, so the scheduling and the purpose of the buildings are a little different in the homes and the offices that we're accustomed to. So, you know, you go off -- sort of offline, so to speak, for a period of time. Does that affect the way you plan or -- both on the building design the way you're consuming energy?

MS. CHAISTAIN: We're pushing within -- so my -- I live within facilities management and services and within FMS, we are pushing the canvas a little bit more the academic affairs side of things on how we utilize our space and when and which spaces we're utilizing.

So during the semester, you know, we're utilizing the full campus. But when we go to say summer break, for example, or, you know, winter break where we still have courses going on but it's on a much, much smaller scale, it's been fun and interesting working with faculty. You know, they get very addicted to a very specific space and like they can't teach their class anywhere but this room. And so, you know, trying to bring a heightened awareness to the impacts of space utilization and to -- to work on more efficiently using spaces and getting some faculty to understand that, you know, we're going to need you to teach your course in a different building, we're not going to heat or cool the

building for your one class.

And so, again, just trying to make people create a heightened sense of awareness on the impacts that space utilization have, specifically on a college campus where you have these large chunks of time, you know, where you might only be using 15 to 20 percent of your building space.

So it's a work in progress but it's definitely one of my main goals over the next few years is to try to get people to be a bit more open to which spaces they're using and when.

MR. ROSALES: Thank you.

MS. CHASTAIN: Uh-huh.

MR. ROSALES: Okay. So let's start with Cheri on this one.

Talk about some of the technical areas --

MS. CHASTAIN: Uh-huh.

MR. ROSALES: -- opportunities. I'm going to kind of pivot toward the policy side now.

MS. CHASTAIN: Okay.

MR. ROSALES: Can you touch on that to the extent that you feel there might be policy or regulatory barriers that are keeping you from realizing your potential to decarbonize the projects and programs you're working with?

MS. CHASTAIN: Yeah, I'm still working to figure that out but I think we -- we almost have a reverse situation because we are a state entity. The state has passed very

aggressive goals. Our campus has passed very aggressive goals so now we're just trying to figure how to achieve these aggressive goals and targets that have been set for us.

So, you know, on the one hand, the policy is great because the policy is there and it is forcing us to really think differently and act differently, and invest differently. You know, so I don't see lack of policy as a problem, per se. You know, I think the state has set really aggressive targets and, you know, as somebody who's environmentally affiliated, I tend to personally appreciate that, but it does, you know, it creates a problem when you don't have the funding to actually achieve the goals that have been mandated for you.

So for -- like everything, it comes back to money.

MR. ROSALES: Okay. Now, Richard, same.

MR. OBERG: So it's been an interesting ride. I've been in this industry for a few years and at SMUD, before I started there, they used to have an all-electric home. And then through code changes and Title 24, then we couldn't have an all-electric home. And now we're turning around to being back to an all-electric home.

We did have some interesting experiences with some of the local jurisdictions who actually do the enforcement of permits and the first couple of customers that said hey, I want to replace my gas water heater with an electric heat

pump water heater, they said, no, you can't, Title 24 forbids it.

And so then we had to go through the exception version and show them how that it actually used less energy than gas did. And once we got through that with several of the jurisdictions, then they started catching on. And so some education of that -- that group and we did have to work with CEC to try and get some of those things straightened out.

The other kind of interesting policy changes and this is strictly from an electric -- or from a utility perspective but, you know, as we've done energy efficiency for years and years and years, we always talked about first-year savings, first-year savings, and now with SB350, it's more cumulative, you know, what's it going to look like? Which I think is a huge step in the right direction but it's a change in the way of putting together an energy efficiency or electrification portfolio because you're not looking for that big win right at the end, you want to -- or right at the beginning, you actually want to have it last over a long period of time so that the more expensive stuff now become more viable because you know they're going to last for a long time and you don't, you know, I have to balance budgets and I'm balancing budgets off cost effectiveness. So by doing that, I have to make now changes within the Utility Act. I've educated them very well

at first cost and now I have to talk about lifetime cost. And it just -- it just gives an interesting flavor to it. But it's, you know, it's interesting stuff.

MR. ROSALES: Okay. So I'm going to -- now I'm going to ask a more pointed question. And this is probably based on your guy's experience. So when we were talking about the -- we were talking about technology or infrastructure improvements, what comes up in your mind as the most advantageous practice? Maybe it be technology or maybe be some software solution that you think is probably most right or most has the highest potential for use in building level to help decarbonize some of the energy use.

And I'll start with you, Richard.

MR. OBERG: So the technologies, you know, they're not -- no technologies ever were perfect or ever really done but the technologies are there. We have heat pump water heaters that work well and we've been working with manufacturers along with a large consortium to get it so instead they run on 220, they run on 120 so, 110, so that people can just plug it in because there's limited amount of panel space in people's homes, especially older homes.

So enable to make that change, we've been working like I said with the consortium to try to have the manufacturers build a little bit different heat pump. But the technology is heat pump. I mean, we've been doing heat

pumps for a long time. Heat pump space heaters have gotten so much better than they used to be and now we can do mini splits and stuff like that.

It's -- the technology is there, but customers are just not used to it. They're not used to -- well, I use the induction cooktop as an example. I mean, how of you have an induction cooktop?

UNKNOWN SPEAKER: Two.

MR. OBERG: Two, right? And then how many of you would never -- or your spouse -- would never give up that gas because it's so cool to see that flame? I mean, I've got people -- yes, see, right there. I've got people that I work with who say I just, there's no way I'll ever do it. And then I say, okay, well, let's start talking about that. I can heat up that pot of water in half the time.

Here's the picture of what that actually is doing with that gas flame. It's going around the pot, it doesn't totally heat everything -- the heat doesn't all go to the substance that's in the pot.

And as you go through it and, you know, I talk about this way too much at work, not that I'm an expert at cooking but, you know, we've gone through hot air fryers and Instapot. Instapot was this last year, right? But, you know, I'm old enough now to remember when microwave ovens came in and everybody was like, I'm not putting, I'm not

getting one of those microwave ovens, it doesn't brown anything, I'm not doing that.

But you should try an induction cooktop, see what it's like, see how good it actually is. But that's going to be a major education piece that we're going to have to do going forward as a community, not just SMUD or not just the Energy Commission but the whole industry has to start educating people on what an induction cooktop does. And then in retrofit situation, you've got to wire for it. And the house, if they put in a gas stovetop they didn't wire for it so that's going to be another cost that's going to be associated with it.

So it's those kind of things that the detail stuff which is the world I live in, that's the stuff we're going to have to work on. So panel size, induction cooktops, getting people used to -- and this is going to be kind of foreign to the way we have always talked to people. It's like, oh, you're going to be out of your house and you've got your, you know, you've got your heating set at 70 degrees, oh, cut it back to 60 while you're out of the house. Well, that doesn't work very well on a heat pump, you actually need to keep the heat up. You can drop it at a couple of degrees, but if you drop it too far, you'll use the house until you get some warm time.

So we have to change our messaging just a little bit.

But, you know, this is -- this is a new world. Right? If we want to really decarbonize, people do have to not necessarily change their life, but they do have to change their behavior a little bit, as evidenced by me going and finding a place to charge an electric vehicle. You know, it's different than, you know, as I was driving up here, I thought, okay, so where can I stop because I'm used to buying gas, but it's different. And that's just -- that's the world we're going to need to get used to and be able to transfer to.

MR. ROSALES: Cheri, how about you? What comes to your mind? I mean, there's an assortment of -- the consideration is like very complex when you try to maybe pitch it to the folks that you have to respond to. But, you know, you have expertise in this field. So what comes to your mind in terms of having the highest, most cost-effective potential and can you tell us about that when it comes to trying to pitch your idea to get maybe like an easy fix, relatively speaking?

MS. CHASTAIN: Yeah, I actually wanted to -- to kind of tag on to something that Richard was just talking about that, you know, we do need a heightened sense of awareness. Right? The technology is out there, these things are possible and feasible, you just have to present the best case for it.

But I will say that I think we need more education,

too, on engineering firms.

MR. OBERG: Absolutely.

MS. CHASTAIN: And, you know, I run into this a lot at university but also in previous roles that the engineering firms come in and, you know, they just don't have experience in noncarbon based, specifically space heating. Right? That's just that's -- that's what they know, that's what they go to, so that's what they design, that's what they pitch. And, you know, it's finding those engineering firms and those folks that have experience with noncarbon intense processes and technologies and bringing them in. I see that as that's been a struggle. And I think that will continue to be a struggle until, you know, we start to have this behavior change, right?

MR. OBERG: Yeah.

MS. CHASTAIN: And it's headed that direction but it does need to happen at all levels from consumers to everybody -- everybody along the space.

You know, something that we struggle with, I think, and this is probably in general also is laziness. You know, here's one example. You know, one of our buildings on campus opted not to have an electric domestic hot water heater because the exhaust piping was too complicated. And so, you know, it's -- well, that's just lazy. You know. So, you know, really in my experience had the best luck -

Are you Sean?

MR. ARMSTRONG: Yes.

MS. CHASTAIN: Hi, welcome, have a seat.

MR. ROSALES: Welcome to Sean just joined us. Yay.

MS. CHASTAIN: Join the table.

MR. ARMSTRONG: Thank you, thank you. It's just an extra hour of travel because of the road. So.

MR. ROSALES: Thanks for joining us, Sean. Better late than never.

MR. ARMSTRONG: Yeah.

MR. OBERG: Now you have to answer all the questions we just did.

MR. ROSALES: So we [indiscernible].

MR. ARMSTRONG: Sorry about that.

MS. CHASTAIN: I was just going to say, just kind of finishing that thought. You know, putting forward a case that really takes into account the entire picture. Right? And recognizing that our campus or other institutions have climate change goals and targets and we can't just do what's easy or what's comfortable or what people are familiar with but putting together an entire package that is innovative, that is interesting but that also, you know, quantifies some of these long-term impacts. And really -- it comes back to, you know, we've got to find a better way to include environmental and climate-based concerns or even climate

risks as part of the overall perform for a lot of these projects.

You know, we are in a community that has been heavily impacted by climate-related disasters. And so recognizing that these unintended expenses and consequences need to be factored into the overall design and decision making for equipment and how we're running, building, and operating buildings.

MR. OBERG: If I can tag off on that. The other piece -- you're exactly right. The education, the training piece, this is new -- this is the green workforce.

MS. CHASTAIN: Uh-huh.

MR. OBERG: That's the other piece.

MS. CHASTAIN: Uh-huh.

MR. OBERG: There's going to be a, you know, as we're changing out 550,000 customers, there's a lot of work associated with that and that's jobs. That's really what this economy needs. So.

MS. CHASTAIN: And institutes of higher education --

MR. OBERG: And there you go. See.

MS. CHASTAIN: -- need to do a better job of putting those people into the workforce.

MR. ROSALES: So I'm going to introduce Sean. Sean Armstrong is principal and coowner of Redwood Energy Consultancy. He's out of Humboldt, he's a professional

designer, building designer. Obviously, he builds -- largest buildings are green and use our decarbonize buildings. He's an energy efficiency guru as well. Known Sean for a few years. And he obviously has an intense focus right now on zero carbon building and he's been doing a really good job of spreading his expertise. So he just joined us.

Sean, we were -- we're just starting but I'm going to go back to one of the first questions just so folks online and in the room can hear your take.

One of the first questions I asked Cheri and Richard here was what actions are you taking locally to have decarbonized buildings?

MR. ARMSTRONG: So just drove in from Arcata. And the city of Arcata I think spoke earlier that they've just announced as a plan for the city so they're going phasing out gas starting 2020 on new construction.

So one of the things I've been doing just locally was we hired a leading legal firm Shute, Mihaly & Weinberger to write the five different legal ways that a city or county can phase out natural gas. So, you know, through CEQA, through police power over appliance, police power over the building primitive piping in the walls through gas mitigation, like if you have a gas impact, a gas fee, recommend fund decarbonization, missing one there.

So providing legal support for our local community,

that's been a local action. It's available for the rest of the people in the state, of course. Arcata also, it developed the first zero carbon apartment complex. I was the consultant on that. So Arcata, and Humboldt County generally we've taken like very practical steps. We're going to make this building all electric, we're going to solar power it. It's going to be done in 2011 before solar is cheap, so this is going to require a commitment to a legacy by the city council to extra fund it. And that's right next to the co-op and the post office and the downtown for low-income seniors. People wait to move into that place because it's so well situated and so comfortable. It's really warm, well insulated, well heated, well cooled.

So I think the policy side. You know, city of Arcata is the first city in the United State to do a five zero vote or any vote of kind as a public -- they did a five zero vote saying they're going to ban gas starting next year in new construction. And they're the city that did the first zero carbon apartment complex. So policy and practicality is what I see the city of Arcata bringing.

MR. ROSALES: All right. I want to come back to you because I think Richard and Cheri will probably say okay, let's start with Sean with the next question.

So just right when you got here and I asked Richard and Cheri what they thought -- I asked them a technology

readiness question and they gave me their answers. But I also, I think they're pointing at something very important which is obviously lack of education in the marketplace both for like professional designers, conventional designers, stuff is lacking as well. As Richard was pointing out, consumers are just unaware, maybe even timid to try out some of these new products.

So that kind of speaks to the fact that building decarbonization is just really new space and we've, you know, we've got to fill it in quick and all that. You guys are all doing the work, all three of you guys, respectively. But I'd like to know, I'm kind of approaching some of these answers from different directions here what you all are doing individually and within the context of your organization to help other smaller groups or dedicated individuals to leverage what you guys are doing to help out building decarbonization.

So Sean, I'll start with you. You know, are you working with contractors, labor groups, maybe consumer groups, small recent graduates? Can you tell us how you're helping other folks leverage your expertise to help obviously fill in building decarbonization space?

MR. ARMSTRONG: Sure. I have an affirmative action internship so about ten students a year. I make sure I never have more than one guy to one woman so if I recruit a guy,

yes, he's accepted. He has to be bring a woman or a person of color into it. I just maintain a constant relationship with the university, meet in a coffee shop in Fridays. It's informal slash formal. It's a way that I've been able to recruit from a majority minority HSU campus in engineering. Future that looks like the campus and looks like California appropriately.

The other thing I would say is that it's a rural to rural outreach. Decarbonized buildings is about 60 percent of the building stock in the south, zero emissions buildings. Now the energy supply to the south is heavily coal based. The buildings are decarbonized, though. Sixty percent of new construction has no gas in it.

So the strategy of getting the grid green in the south versus getting the buildings green in the west. You know, we have a green grid, we have dirty buildings. 85 percent are connected to gas in California, whereas it's 50/50 in the rest of the nation and it's more than 50 percent all electric if you're going into the south of the United States because it's just cheaper.

I feel like developing in rural areas has taught me how expensive gas infrastructure is, how important it is to eliminate it from my affordable housing developments. And I'd just like reaching out to fellow rural people. The rural electric co-ops of our country, this rural, arguably rural

utility has done a lot of leadership work in California. But I look to the south.

MR. ROSALES: Cheri, do you -- do you want to -- do you want to share anything, if you have any thoughts on this question?

MS. CHASTAIN: Yeah, I'll just add that, you know, so Chico State is part of a 23-campus system and so collectively we have a lot of lessons that we can learn from each other, we have students that have innovative ideas and are passionate about new ways of doing things and new ideas. And, you know, we can tap into that enthusiasm. But collectively, as a 23-campus system, you know, we do have ability to influence a bit more kind of flex a little bit of our purchasing power. And so, you know, we can -- as -- because natural gas is cheap. It's cheap -- it's cheap now. It's not going to be cheap forever.

MR. ARMSTRONG: Not compared to solar.

MS. CHASTAIN: Right. Yes.

MR. ARMSTRONG: It's expensive compared to solar.

MS. CHASTAIN: Yes. But, you know, we can as a system, we can come in and start to -- to -- through direct access and CCAs and through other options, start to create a system where electricity is comparable to natural gas in pricing as a collective and as a collaborative which, you know, is -- it's been pretty cool.

MR. ROSALES: Thank you.

Richard, you work with a lot of groups. I mean, I'm sure as Cheri was mentioning, you know, design groups, contractor, manufacturers. Do you want to just choose one, kind of tell us what -- how work is progressing there?

MR. OBERG: Sure. Let me talk about the contractor community.

So the way our programs run in SMUD, for the residential customers if your air conditioner goes out, we have a set of contractors, they're not on an approved list or anything like that, but we know who our contractors are. And if they want to participate in our program, they have to meet certain criteria, like permitting. And so that's why Sacramento has one of the higher permitting -- or permit rates compared to other areas. So if you participate in the program and our -- like I said, our -- we've got 550,000 residential customers. We do about three, four thousand air conditioners a year. And those contractors, they come in to us for training. We show them what we want to see. We want to make sure they'll pass the -- when the code enforcement people come around.

But now we're asking them to do something different. We were doing space heat -- space heat pumps before but only on customers that had space heat pumps. And so they would just do a like for like change out. Well, now we're actually

asking to say no, get rid of that gas furnace and put in a space heat pump. That's new to them. Or the amount we pay to have them do this work is different than it used to be. So that means more training and getting those contractors on board.

And we know that that's a pretty big lift in a pretty short period of time. So we have actually just -- jeez, I don't know if we've actually signed a contract but we do have somebody who's going to come in and be the trade ally, who's going to come in and help educate and watch over those contractors as they come up to speed and the ability to do heat pump water -- heat pump space heaters.

Now heat pump water heaters is a whole other thing. Because -- and if you talk to anybody in that space, it's like oh, I've got to have three different trades in the house to meet the electric and the plumbing and, you know, all pieces there. So we're going to be working with those organ -- those contractors so that they for ones that have a general contractor license and can do both parts, they would be able to do that. Or get them to partner an electrical with -- or an HVAC company with a plumbing company and maybe with an electrical company, depending on if they need to have a panel change out. So that they're all working together so that when, you know, as we can all know when you're water heater goes out, you don't want to wait three weeks for hot

water.

We did have somebody the other day -- I had one of our employees said yeah, I wanted a heat pump water heat so I went without hot water for three weeks and I just went to the neighbor's house. Most people aren't accepting of that, right? Most neighbors aren't accepting of that.

So being able to get that installation to go faster and that includes a permitting component and that also includes the trades. We're going to have to treat -- train up those trades so that they can know how to move faster on that and not drag out a water heater change out over a week. People aren't going to be accepting of that. And that's just a matter of training. And so that's one in particular that we're trying to build up.

MR. ROSALES: Kind of the same questions, but I'm going insert CEC into the question now. I don't know if you guys have thought about it and if you guys don't have a response you feel comfortable sharing, that's okay. But if you do, great.

What can CEC do to help leverage the influence you all have in locally or in your regional footprint? And what areas perhaps you suggest we can make improvements on or think about.

And I'll start -- I'll start with Sean again and then come down.

MR. ARMSTRONG: The CCE, like community choice energy?

MR. ROSALES: CEC, California Energy Commission.

MR. ARMSTRONG: Well, I found it really easy to do zero carbon buildings in rural areas. I've not had a problem to make that work. The -- my most challenging things right now are six-story zero carbon buildings we're doing in Oakland and San Jose. So because we can't model a central heat pump, we can't get it to balance against other parts of the building shell, the windows, the HVAC system. Domestic hot water system because it's a number one load in a big building like that, doesn't have much of an on envelope. We're – we keep on running into modeling issues. So central heat pumps today and now are probably over four stories tall.

We also have problems -- we notice that poor people do hydronic space heating but some people do with heat pumps, like it's a $30,000 add on to your heating system to do it through the floor so that's not appropriate for affordable housing but we can't do that either. We can't space heat with water which we do some projects doing with a big central heat pump.

So I find what the Energy Commission can do, I think it's shocking that we live in the head of software development in the United States in Silicon Valley and our software is broken on some of the central things that we do

for electrification right now. Because it's code compliant to put in an all-electric building but our software doesn't work compared to putting in a boiler which is an old traditional technology been around for a while that we shouldn't be doing anymore.

So having to be easy to do the wrong thing and having be challenging to get the software to do the right thing around heat pump water heaters and hydronic space heating. So I'd say devote more resources to solving that.

Pretty much everything else is great.

MR. ROSALES: I think that was clear.

Cheri or Richard, I don't know if you guys have a thought on this.

MS. CHASTAIN: Yeah --

MR. ROSALES: And, you know, I'm going to -- if you have other thoughts and it doesn't have to just be the California Energy Commission but maybe at another -- at the state level to one of the other state agencies, we'd like -- if you have thoughts -- more prominent thoughts on those. But go ahead.

MS. CHASTAIN: Do you have more you want to add?

MR. ARMSTRONG: No, that's fine.

MS. CHASTAIN: I -- I would say rebates and rebate assistance. I think, you know, like we were just talking a couple of weeks ago, a hot water heater went out in one of

our spaces and, you know, it's like okay, here's the standard replacement for it and if we want to go electric, it's going to be, you know, a couple of thousand dollars more. You know, if there were a way for us to kind of offset that delta a little easier, I think that would make moving toward some of these especially smaller scale electrification things on our campus a bit more practical.

You know, but we come up with a whole bunch of other issues that I don't know if the CEC could help with. You know, space is a really big issue for us. If we start to look at electrifying our buildings, you know, our buildings didn't come with basements, they don't have extra space for additional switch gear in our buildings. And so space is an issue. Again, I don't know how the CEC solves that. I don't know anybody solves that one.

And then cost justifications and, you know, being able to compare, you know, beyond just the shadow of business as usual, right? This is just the cost for business as usual. But if we are going to meet these climate neutrality goals and we do have to start investing in carbon offsetting, you know, starting to factor some of that into traditional cost justifications I think would be helpful. And, again, I don't know if that's a CEC specific thing. Throwing it out there, food for thought. I'll leave it there.

MR. OBERG: So I'll feed off on that one. I've lived

a lot of -- lot of my life dealing with the cost test that we've been using in California for energy efficiency. And it doesn't work for this. And I know that there's discussions on ways to improve it and have a different cost test but, you know, for us, it needs to include carbon, it needs to be the long-term strategy. It needs to include the workforce training and unemployment rates and things like that that don't necessarily always get included in all of our cost test because, you know, somebody in the rural area, it's so interesting for me to hear you guys. You've got just like totally different problems than I've got.

But it does come down to cost tests again. And I'm going to feed one step beyond that that most of us don't think about it too much, but the attribution of the savings. Because we're going to decarbonize. And is it going to be the consulting firm or is it going to be the university? Or is it going to be the utility? Or is it going to be the state that's going to claim that carbon savings? And we're playing that game a little bit with electric vehicles right now.

And I can see that the same thing is going to happen here with decarbonization. Because we all want it. You know, everybody in the room can be in agreement that we want to reduce the amount of carbon used. We want to decarbonize. But it's got to be of some value to me as a utility or to the

utility or to the consultant. They've got to have some value that they can extract out of that for them to go forward.

MR. ROSALES: Thank you.

I do have one more question for the panelists but I'm going to pause here, just do a quick time check. I'm going to check with audience and the folks on the phone, see if there are any questions right now from the public audience. If there's not much, I can follow-up with one question. But. Yeah. Would you mind coming up also to the microphone? Because we need to record the question.

Great. We've got one question.

MR. JACOBSON: Lou Jacobson with the Redwood Coast Energy Authority.

And this question is for Richard and then the panel. Could you expand on your thoughts on the three-prong test and how that might play into decarbonization moving into the future where that proceeding is going.

And then to that point, could you speak to the avoided cost and the shift in the Deer Peak load curves that will be rolling out in 2020.

MR. OBERG: Okay. The three-prong test, you actually just went right above my pay grade. I do know about it. But that is an issue. You know, and as I look for -- as I look forward to, you know, from this day where energy efficiency is good. Right? Everybody likes energy efficiency. Energy

efficiency is great. But as the grid gets cleaner, then maybe we need to be making it even cleaner. Right?

The energy efficiency, while it's good for the bottom line, which you continue to do energy efficiency, it won't have as much carbon vale because you're offsetting clean power. So that's something that needs to be considered in the three-prong test piece of it but I'm not an expert on that.

And what was the first part -- second part of that question? I'm sorry.

MR. JACOBSON: It's the avoided cost that we're looking at, the duck curve and how the Deer Peak load shapes are changing for 2020.

MR. OBERG: So that's a really good point. And we've -- we've hired actually E3, I'm going to publicize them a little more.

E3 has been working on that for us because as we look forward on what our green grid will look like into the future and what we've got for opportunities to reduce the -- reduce carbon and reduce -- and increase electric vehicle usage and those kinds of things, they're actually setting up -- we're providing them with load curves to try and help identify what the carbon value on an hourly basis as we reduce it. So we're not waiting. I'm hopeful and I know E3 is under contract to CEC, too, so they probably use the same type of

methodology. But we're pushing forward not waiting for an answer, we're trying to help influence the answer, I guess.

MR. ARMSTRONG: I'll weigh in on that one. So in about 2015, I become familiar what the three-prong test was and started making a ruckus. Because as an electric only consultancy if none of the utilities are offering electric rebates and your efficiency which might be putting in a 350 percent heat pump versus an 85 percent efficient furnace but you get no money for the efficiency. So I spent years getting zero money on new construction as well as retrofits for electrification. Quite frustrated. So my understanding is that this summer the proceedings is getting resolved by the Public Utilities Commission. The Sierra Club, the NRDC, but particular the Sierra Club has been very active on raising a ruckus, raising the topic in different proceedings over and over where it's sort of inappropriate thing for the proceedings so the judge would say like, mm, next time. But I guess this summer is next time.

So President Picker, I got to see him last Monday down at the CPUC event, what I've heard him say that he would prefer to just change the topic sort of and focus on the 1477 funds, the 300 million that -- sorry, 400 million that's coming out over a course of three years to do decarbonization. He'd like to focus on that less contentious issue and that does seem to be going faster as a consequence

because he's not pushed hard on it for a couple of years and people have been asking.

So money's going through 1477 very actively and we'll see what happens maybe this summer is what I've heard with the actual three-prong test judgment.

MR. ROSALES: Do you guys have any response? Is there any other public questions, comments anyone would like to make? Any on the phone? Okay, great.

Well last question before we wrap up there. So thank you all for sharing a lot of insights about all the work you guys have been doing. And here's just a detail question.

How do you three each go about collecting data and evaluating the performance of the work? What you have done.

I know, Cheri, you kind of just started but I'm sure you've probably been thinking about exactly how you track your progress and how you demonstrate performance. And maybe I'll start with you in that sense.

How do -- how have you guys solving for that problem?

MS. CHASTAIN: Don't have a solution yet. My plan at this point is most likely we will utilize our greenhouse gas inventory as the metric. And so looking at, you know, natural gas use, and again our greenhouse gas inventory is for Scope 1, 2, and 3. So my thought is that will probably be that data collection system and then the tool that we will utilize for public communication around our progress.

MR. ROSALES: Thank you.

MS. CHASTAIN: Uh-huh.

MR. OBERG: So this is a difficult one because you're doing activities now that are going to impact a grid that we don't know exactly what it will look like in the future. So we are struggling with this one, very candidly.

We have a sense, we have our IRP that got submitted so we have a sense of what it will look like. But I've got the long energy efficiency background where you do M&V, you go back and check to see what you did and you go back and see what the grid actually looked like. So we're going to be needing to be checking continually on how we're doing. This is not a one and done sort of thing. This is one of those things where we'll save carbon this year and project what it will be in the future from that action, and then we'll save more carbon next year and we'll project and we'll go back and see what we did on the year before.

So lots of bookkeeping that needs to appear here. But as a state, we're going to need to do that bookkeeping to really see that we're getting -- reducing the carbon, reducing carbon the way we think we are.

MR. ARMSTRONG: So I had a really fun time monitoring our apartments. We got 470 of them under second by second monitoring for each and every load since 2014. And I could tell you things about people now that I had no idea. I'm a

biologist by training and I didn't realize like how fingerprinting we are and how we live in our homes. Like I thought I'd understand how to do thermal storage and water heaters. Turns out that every single home has a different way to use water. So I can't easily just load up during the day because people are using it during the day in ways that don't show up in average graphs. So -- or another thing like the lowest user and the highest user every day in an identical two-bedroom apartment with the same occupants and the same income is using tenfold difference in identical apartment. Every single day it's a tenfold range between lowest and highest consumers. And over the course of the year, it balances out to like a threefold difference on average between lowest and highest.

So like senior cottages, we were 180 percent over solarizing these senior citizens. They don't bathe and they don't cook. And it just radically reduced the two largest uses in the home. And I found this over and over in the senior housing, they don't bathe and they don't cook, they don't bathe -- like they're just flat -- they flatlining on these two things.

So monitoring has revealed human variation, it's revealed like we had a zero carbon project in Dixon. Super nice. It turns out we're going to be zero carbon and we didn't succeed because there are two water heaters in the

entire apartment complex that switched to electric resistance mode and just knocked us off. It's just -- like that quadruples the energy consumption of the water heater to go from heat pump to electric resistance.

So I find that small defects were -- like right now we have water heaters where 62 apartments, it looks like 58 of them have a malfunctioning occupancy sensor that makes it run -- anything like all night long the water heater is just getting cycled and cycled and cycled and cycled and cycled. And all of the occupancy sensors are broken. Not just a couple but the whole apartment complex. So our energy savings measure is turning into a heat radiator to the wall.

So I found it critical to do like observation. I found it critical to do it at a granular level because devices interact with others and they can catapult energy consumption in ways that just emerge. Another one where we had two-thirds of the thermistors, the thing that takes a temperature in the tank were in the wrong port, and so therefore they were running nonstop thinking they had cold water when in fact the water is hot at the top. And a whole apartment complex is getting broken this way just by the misplaced thermistor. It was just everything because the water heaters are connected to the space heaters.

So I found it critical and I found it to be unexpected. I found that most people, if they're high

consumer, it's not really their fault, it's mostly their plug loads are completely on all night long and they have a little tiny bump when they actually use anything. But pretty much people's plug, those are flatlining at the level at all moments other than a little bit when they use them. People are not really to blame for their high consumption, frequently. And even if they were to blame, they have no idea how to fix it. And so I find like I've been much more forgiving of humanity as a consequence.

You know, it started out as an environmental sort of misanthrope, basically, should I even be alive? If I'm going to be alive, I should dedicate my life to doing right. So that just seeing like almost 500 households living for years just really how diverse and how forgivable a lot of it is. And therefore how we should be building the grid to be green, not people's homes. People are all over the map and we should be building a resilient grid that handles their average behavior as opposed to nailing each person who is a high consumer and yay, if you're a low consumer. Because maybe you're old and don't eat. Once a day, you know.

MR. ROSALES: And that's a fascinating point because there's a lot of follow up. But I'm going to ask you this, though.

I can see how all that information further -- further enriches your wisdom about how to operate these projects.

How do -- how do you translate all those learnings into changing behavior to some extent but I understand you've learned some lesson.

MR. ARMSTRONG: Yeah.

MR. ROSALES: But at least sharing some lesson so folks, if I would -- if I'm a tenant and I didn't know I actually had, was doing something was wasting energy, but how have you gone about taking some of those steps?

MR. ARMSTRONG: We tried mailing everyone letters every month of the year, like 100 apartments in Spanish and English, telling everyone how they're doing next to their neighbors. We found out we could save like 2 percent if we told everyone how they're doing relative to everyone else and did every kind of education that we could think of. So I realize that these already efficient departments didn't have a lot more they could do other than radically reprogramming people's lives. So where that's led me to think is that the Energy Commission could do things like a heat pump water heater should not be allowed to go under a resistance mode unless there's a crisis because it quadruples energy and it builds into it something that can fail to that is a bad thing.

So me looking at heat pump water heater is something I should be focusing getting an inverter so it can be a compressor only functionality or run them in different ways.

I'm trying to find ways to protect people from the foolishness of manufacturers. You know, like -- because I find that trying to inform them doesn't do much. I really have to deal with it more at the code basis. Like get more efficient appliances, reinforce ENERGY STAR, you know. ENERGY STAR everything, even your cable top box. Like, really think about these things. It's so important to turn stuff off.

Is that?

MR. ROSALES: Yeah.

MR. ARMSTRONG: Yeah?

MR. ROSALES: Thank you.

MR. ARMSTRONG: I think government should protect people from manufacturers.

MR. ROSALES: Thank you.

Well, that's it. Thank you guys for your time. That was really helpful and really insightful. Thank you.

MR. ARMSTRONG: Sorry for being late.

MR. KENNEY: Okay. So we're moving on to our next panel here.

So we're moving to Energy Efficiency Action from POUs and CCAs. So I'll be moderating that panel. I'd like to bring up Nathan Aronson from Redding Electric Utility. Lou Jacobson from Redwood Coast Energy Authority. And James Takehara from Shasta Lake Electric Utility.

I'd like to start -- I'd like to start by giving you guys a little background about who our panelists are. So start with Lou.

Lou Jacobson is Redwood Coast Energy Authority's director of Demand Side Management. He moved to Northern California from rural West Virginia to learn more about behind the meter energy programs that serve rural and hard to reach communities. Lou is the local government's sustainability energy coalition board member cochair to the rural and hard to reach working group, and a California energy efficiency coordinating committee member. Lou is currently exploring how to harmonize the locally funded CCA programs. CCA programs funded through Public Utilities Code 381.1, rural-ran investor and utility administrator third-party energy efficiency programs.

James Takehara joined the city of Shasta Lake in 2018 as electric utility director. He previously worked for the Northern California Power Agency, NCPA, representing 16 publically owned electric utilities and various efforts including procuring utility and renewable energy supply and administering carbon reduction mandates.

He started his career in the electric industry in 1997 and has worked for NCPA, the city of Roseville, and the California Independent System Operator. He holds a bachelor of science in the agricultural and managerial economics from

UC Davis and a master's in business administration from UC Davis graduate school of management.

Nathan Aronson is a manager with the Redding Electric Utility where he oversees long-term resource planning and REU's customer program portfolio. Nathan brings a holistic perspective to energy efficiency program design and implementation based on years of experience working as an energy efficiency design engineer and a program design in implementation professional prior to joining Redding Electric Utility.

Nathan earned a mechanical engineering degree from CSU Chico in 2002 and has worked in energy efficiency and renewable spaces since 2005. He's a licensed mechanical engineer, certified energy manager HERS whole house rater and a VPI building analyst.

So thank you all for joining me up here today to learn more about what your organizations are doing.

So we're going to start with a few questions to kind of just lay the groundwork for what your organizations are doing. So it's number one, you know, what are your organizations' energy efficiency goals. So that can be just solely focused energy efficiency or more holistically, you know, electric vehicles, integrated energy efficiency, or PV renewable energy.

So start down there at the end with Nathan.

MR. ARONSON: All right. Thank you.

So I took a look at our goal and I think our goal is really to meet all of the statutes and regulations but while maximizing the benefit to the community. And that's really important here in Redding is looking at the community needs and looking at the way that we can kind of putting actually kind of putting that first and then see how we can tailor those programs to meet the SB350 goals and all of the other energy efficiency renewable goals that we have.

In terms of our energy efficiency goals, we're really looking at the SB350 targets that were assigned for the doubling of EE so the net targets and those are probably the most recent set of targets so we're working towards those and designing our programs to achieve those.

And then on a bigger picture, we're really interested in kind of everything you just said so energy efficiency, electric vehicle, you know, transportation electrification, and also building electrification. So those three things. And then all of the customer education that goes along with those things to make them work.

MR. KENNEY: All right. Just go down the row.

MR. TAKEHARA: Thank you. Good afternoon everyone.

City Shasta Lake, we have the same statutory obligations as city of Redding so I can just say ditto there. Foundation of our energy efficiency program is really rooted

in those obligations. But what we try to do with ours is given the makeup of community, we're trying to design a set of program offerings that create a sense of equity amongst the different ratepayers using a very diverse set of ratepayers. We have a number of old structures. Shasta Lake came about as just a bunch of towns when the Shasta Dam was being built in the '30s so we still have structures that are there that aren't necessarily were intended to still be there if you know what I mean.

So we have some challenges there. Set of programs targeting how to retrofit older structures but at the same time, you know, targeting some improvements that we can gear toward lower-income folks. But also, we don't have a huge business climate up there, it's more of a better community, but at the same time, there are some businesses where we have programs set to business vitality. So a little bit for everything is sort of the goal there, I guess. And as we progress forward and state policies continue to evolve, decarbonization or electrification are going to be things that we're going to be definitely look at this next round. I guess we're going to start looking at it this year.

So at any rate, that's it in a wrap.

MR. JACOBSON: Yeah. So ditto, ditto. We kind of see the state goals as the floor as, you know, really it's the absolutely bottom. And what we're trying to do is just

move past that. Back about seven, eight years ago in partnership with a number of local entities including HSU, Humboldt State University, we moved forward with the comprehensive action plan for energy in Humboldt County along with repower Humboldt.

And in those documents, we really outlined how to move forward with a vision where we are in that export of energy in Humboldt.

We have aggressive goals. Originally it was to be 100 percent renewable and decarbonize our power mix by 2030, our board recently bumped that up five years, and so now we're looking at a 2025 benchmark. And that all feeds into our energy efficiency goals.

The CAPE document, that's the Comprehensive Action Plan for Energy for Humboldt County which is made part of our general plan energy element really says that all buildings are going to be energy efficient. I'll come back to that, it's a pretty -- you have to unpack that one -- that energy education is going to reach everybody in Humboldt County which is also a pretty bold undertaking and that are energy consumption is level.

And so although we will speak about our community choice aggregation later, we really don't look at our role as the energy authority as purely focusing in on electricity, it is all energy and so that is looking at electrification,

decarbonization, looking at electric vehicles as a plug load and how to manage those and integrate those into our services.

So when we really look at those goals, particularly looking at the energy efficiency component, if this were five, seven, eight, maybe even ten years ago, I would really use the word energy efficiency and embrace that. Today, I really look at this as an integrated demand side management activity. I look at this as an activity that informs an approach that delivers distributed energy resources and user in a way that maximizes our use of renewable power off the grid. So it's coming back to Sean's point earlier where, you know, our building stock is old and largely inefficient. We do have a fairly clean power mix but you have to look at the time of day and particularly look at the duck curve and say look, you know, I could have everybody save energy in the middle of the afternoon when there's a gluttony of solar on the grid and, you know, on our supply side we're getting paid per megawatt hour instead of paying for it. But that doesn't really make sense.

And so how do we move past energy efficiency and take more of a holistic approach and deliver distributed energy resources that only save the end consumer money but maximize the ability to deliver clean, you know, renewable power to that consumer. Because if we just say we're going to install

more solar and everything's going to be okay and save energy while we're doing that in the middle of the afternoon, that may not be the case. It'll be good, but we're not going to decarbonize.

And so when we're looking at our CAPE document, we're unpacking this term energy efficiency, we are going to strive for that, we are going to update our CAPE document. We're going to align that to our county's climate action plan that's moving forward this year and we're going to integrate that into our IRP that should be in 2020 and we want to expand the conversation past energy efficiency.

MR. KENNEY: All right. Thank you guys.

So what challenges and successes have you guys experienced as you approach all these different programs or goals and what kind of successes could you share?

Start right here with Lou.

MR. JACOBSON: Where to begin. I want to get you guys home tonight at some point so I'll try to keep this somewhat short.

There's been a lot of talk about cost effectiveness throughout the day. And I want to unpack that for everybody a little bit, and I apologize if I go a little bit too grandeur on this. But I think -- I think we do need to spend some time on this notion of cost effectiveness and really bifurcate it. There's cost effective to the end consumer,

right? Saying, look, can we deliver a project to that consumer that makes financial sense? And addresses a number of their particular barriers.

And then there's cost effectiveness on the portfolio side of things. And that cost effectiveness on portfolio side of things becomes very, very challenging to manage. Now I can speak as the cochair to the Rural Hard to Reach Working Group which is a group of local governments and CBOs throughout the state that work together to address this stuff and the energy efficiency space as a local government employee or just an energy efficiency nerd. I'll choose the latter.

Predominantly with the California Public Utilities Commission, we talk about the total resource cost. And within the total resource cost we have to look at avoided cost, basically, over implementation cost. So package up your install cost with your administrative costs of that program and out comes this magic number. If it's under one, that program's not cost effective. If it's over one, the program is cost effective. It's sort of similar to prop thirty -- Proposition 39 savings investment ratio, although I have to say this here is much more elegant than the TRC, but that's my personal opinion.

The challenge with that is that if we're saying, hey look, programs are going to move forward that are cost

effective as solely measured by the total resource cost, that really pushes us towards a low hanging fruit, pushes us towards the building types, the DEER building types that have the best deemed or prescriptive hours of operation. It pushes us towards the measure types that deliver the best net savings per unit installed. And it pushes us to the lowest cost qualified product out there, and that's a mouthful, but it's really important because that could create a long-term barrier if you're installing qualified product that's not of quality.

And so although I could never say that delivering cost-effective program should be -- should be dismissed, it is I think in all of our interest to make sure that the taxpayer and the ratepayer's interests are kept in mind. However, there is a fundamental conversation we had around this notion of total resource costs as we're moving forward. This is going to be punctuated within this industry as we look and part of my questions is earlier was truly trying to better understand how load shapes are going to impact energy efficiency programs moving into the future.

Within the IOU portfolio, we have to use the Database for Energy Efficiency Resources, the DEER database. It's a prescriptive load shape, it's not a territory load shape. So Humboldt County load shapes are vastly different than the state's average load shapes. I assume SMUD's are likely

different as well.

However, within these programs and this will set the tone to future questions here, we have to manage to these load shapes. And so that's going to be pushing all the programs to the residential space. So the small offices, the retails, everybody who's operating in the afternoon will not see the same avoided costs, remember the top side of that calculation, that they used to. And so coming back to the challenges, this whole notion of cost effectiveness creates implementation challenges. Because if you were to bring this down to the boots on the ground, our field technicians who go out there and serve businesses, they now have to understand how the building types play out in our ability to serve our community. How the measures down to whether or not is a one to one furnace replacement to a lighting project impact our ability to report to the utility and to the PUCs.

So this all creates great complexity. And this is the challenge, the complexity of our programs moving forward, not only for those who are implementing but for those who have to actually get involved in that. So if you're consumer and I come to you and say hey, I need you to fill out this free ridership form. And they say free ridership? What's a free ridership form? And now we have to explain that to them or we have to talk to them about, you know, what net to gross realization rates are and why that's important and why we

need them to sign this free ridership form.

And I apologize, I will stop in a second, but I think this is the conversation that we need to have, right, and not being afraid to say cost effectiveness is important, but let's be honest and let's call this elephant out in the way that it's actually shaping the programs of today and the programs of the future. Because if we don't, we're going to be met with some surprises in the future as a group stakeholders and as an industry in that the way that the PUC programs are allowed, the way that state programs and local programs roll out might catch us off guard when all the low hanging fruit has been plucked and we have nothing left to be able to package cost effective comprehensive deep reaching projects together from a customer's perspective.

I have plenty of successes but I'll -- I don't want it to be all challenges but I think it's really important to call that cost effectiveness stuff out. If we have time later, I'd be happy to share some successes.

MR. TAKEHARA: City of Shasta Lake, it's main challenges come with its size. We're a very small electric utility, the makeup of the town is, like I said, older homes, people on fixed income, older generation, a lot of retirees, in other words. So it's not the most affluent community out there.

So relative to our size, what that does is creates a

challenge for administration of these types of programs. Getting the word out, administering a rebate program, those kind of -- how you do all the analyses you need to do to figure out what programs to offer.

The way we get around that, I call it a success is there are ways that we can collaborate with other municipally owned electric facilities who are similarly situated in size and makeup. We're a member of NCPA, so they provide a lot of administrative support on the compliant side which is a huge relief. But also we rely on the help of a consulting group, ESG, to do a large part of the administration of the programs for us. But what that allows us to do, we cost share those type of consulting arrangements with those other utilities through joint contracts. It's a very good way to go. It leverages existing resources who are out there doing the work already and then it also with cost share, we can actually stretch out the effectiveness of our dollar. So from administration standpoint, that's how we handle it.

As far as the community, though, and that's probably more interesting to this group, is it's tough because you have a commercial group who is going to be really looking at the bottom line, how does this affect my profit-loss statement. So you really have to understand where they're coming from and it could come down to just their availability for capital to make certain investments. And, you know, the

recession hit this community pretty hard and so there just wasn't that kind of investment that we saw out there to be had. So in meeting our goals in quotes, it could be -- it could be tough, there just may not be enough money out there in the community to make that investment, even with the help of these rebates.

The other thing, too, that applies also to the residential customers as well. Large appliances are a big investment for these folks and they may not be buying ENERGY STAR, they may be buying used. Again, this isn't -- it's -- it's a very different community that I think a lot of people are used to dealing with in larger service territories.

Having said that, we have found some success. There was a program called Keep Your Cool, it was a commercial refrigeration program that dealt with either keeping the cold air in their refrigeration units or coming up with a more efficient way of making the cold air. And we've had successes deploying that out at the local schools and also in the local markets that we have there in town, I consider that one to be a good success. The problem that I have with that one is a fairly short-lived project so it's a matter of keeping track of who these people are, what they've done, and then revisiting after three or four years once that lifecycle comes to an end.

But the other thing that we found as far as the money

problem with the residential customers is get away from the rebate structure where they have to spend money and they may get some money back if they do the paperwork. Instead, on some of these more cost effective things like lightbulbs and smart power strips, just pay for the whole thing, get it, and do the direct install. Go out to their homes, install it, it's done, you don't have to worry about anything. And we do that not only through ESG but also with water efficiency rebates too. I'm an electric guy so I can't really answer any questions about that, but that's also what they do for us.

So those I would just summarize, highlight some of our problems and successes.

MR. ARONSON: All right. So just to put a little bit in context about Redding, we're about 90 percent residential customer base and about 50 percent of our sales goes to residential customers. So that's quite a bit different than most utilities of our size and it really kind of shapes who we are and how we look at our customer programs.

We spend a lot of time working with residential customers. So some of the challenges, people tend to look at solar first. We get a lot of phone calls, hey, we can't find the solar rebate on your website. And we don't have one, that's why. But they're not looking at energy efficiency, they're looking for solar.

Another barrier -- so in order to implement a robust EE program, there's oftentimes, I mean, you both kind of alluded to it some hoops you have to jump through, some barriers. And, you know, the net to gross form is a good example. Another example, we have a window rebate for single-pane windows. But everybody with double-pane windows is mad that they can't get the rebate but if we base it on double-pane windows, then we couldn't offer the rebate at all. So we just have to work with customers. But that's kind of some perceived hoops that they have to jump through.

With lower rates, EE projects tend to take a little while to pay back off of them. I mean, in the residential setting, there is not a whole heck of a lot that's cost effective. In commercial, of course, we have really cost effective lighting, rebates still available. We're -- up in rural Northern California, we saw a lot of T12s. And those are very -- and even T8s now are cost effective to replace.

And then I think also as a rural area, we don't -- we don't get the spillover effects from Sacramento and Bay Area, the PG&E programs, the touched, the more populated areas and now they're reaching saturation so they're starting to move out. I don't -- they didn't, you know, make it this far and so we still have -- we don't have the expertise to just in the area to install some of these measures. So I went to a refrigeration supply house and I was talking to them about

the ECN refrigerator fan motors and controllers and they really didn't know what I was talking about. So that's, you know, I think that's part of our rural nature.

In terms of successes, we did go through and totally revamp our entire residential and commercial rebate portfolio about 18 months ago. And that was just laying a foundation. Really looking at what can we offer the customers. And it was -- it was -- because of the cost effectiveness issues a little bit tricky but here's what we did. We looked at what's it going to cost the utility in terms of levelized cost of savings versus existing baseline. That's what we care about. And we -- we got a number that we can compare to buying solar or running our power plant.

Then we looked at what -- how's it going to benefit the customer in terms of is this measure going to pay back over its lifetime? And we thought that's what the customer would pay back, that's what the customer would care about. And we kind of used that to say here's what we want to offer rebates on. And then we looked at what's the TRC and that brings in all of the assumptions and net to gross ratio and all that stuff. And we kind of use that to tailor our rebates. So I think we probably knocked down our refrigeration rebate a bit because the net to gross was so low and we weren't going to get a lot of savings for that. But we still wanted to communicate to the customer, yeah, you

should buy an ENERGY STAR refrigerator if you go buy a refrigerator. And so I think we have a pretty small rebate, but we still have the rebate. The net result is that we have a reasonable portfolio TRC [indiscernible] at the end of the year.

Another success is a low-income program that we launched last year. And we worked with -- we realized that the LIWP program wasn't coming to far reaches of Northern California because we have no disadvantaged communities here, the CalEnviroScreen tool, and that's what the LIWP program is set up for but we leveraged all the work they did in the LIWP program as well as all the work that PG&E's being doing in the ESA program and we developed a program that kind of wraps around those and delivers all -- all three of those programs in one visit to the customer, as long as the customer qualifies.

And that's been really successful, we were able to hit the ground running. Every -- the workforces are already trained on these other programs. We used the standards, we used the background checks even, and it really helped us deliver successful program really quickly.

And then one other thing, like I said, we have a lot of lighting opportunity up here. Last year we -- two years ago now, I guess, we -- we removed a cap. We removed a $10,000 cap on our lighting rebate program and all of sudden

we saw these huge projects just coming through the pipeline. Stuff that never would have come through before. It was a $10,000 cap and we were writing much larger checks than that to much larger facilities and we were really able to capture that savings which helps our portfolio programs be cost effective. But that was real interest that just removing the cap and making sure our commercial customers knew about the program really primed the pumps for our customers and for the contractors that worked in the buildings.

MR. KENNEY: All right. Thank you.

So could you guys share some of the best practices or recommendations you have for increasing participation in some of these harder to reach communities or low income communities since you guys kind of cross pretty wide spectrum of folks that need to have their energy supplied. You know, what's your successes and recommendations within that specific field?

I'll start at the end there, Nathan.

MR. ARONSON: So for reach and hard to reach customer segments, so we -- you know, we have the low-income program, that's really what we have. And the way we get the word out with that is we partnered with SHHIP, they're our local nonprofit weatherization contractor that does the CSD programs and the ESA program for PG&E. And so they're able to refer customers to our rate program and even, you know,

leave the forms and help the customers sign up when they're in the home.

We also worked with a lot of community benefit organizations and we list all those organizations on our website. So it's kind of a give and take. They can refer customers to us by churches and they can say, hey, you should go talk to REU about their rate assistance programs. And likewise, we can let them know what benefits are out there that might be able to help them.

The last thing we do that's actually a pretty big one is we work closely with our housing department. They're actually implementing some greenhouse gas affordable housing programs in partnership with us. So they find the customers, they have the -- they're working with the developers in getting the projects in the pipeline and then they coordinate with us in order to administer the rebate through our processes.

So those are a few different ways that we use.

MR. TAKEHARA: Yeah, Shasta Lake I already mentioned is the one we had a lot of success with and it's actually grown quite a bit this last year is that direct install program. We don't -- we don't rely on marketing materials and Facebook, necessarily, we actually have somebody that one of the consultants actually going around and knocking on people's doors to promote this directly. And then once --

once they agree to the terms, then they just go on in and do the work that they can do and it's proven to be very successful.

The challenge is with that is you actually need somebody to go around and knock on doors which is a little hard to get up here so that's the other thing. One of the reasons why it was a little slow to start is we had problems with that -- with that labor force issue. So again, it's just one of the things to deal with, to think about in the north state, it's just not a big population center where you can do that kind of thing. So.

The other thing that I'd also like to do is that these homes, most of them are built in the '30s and the '60s, you know, and not a lot in between. And then you have some that are in the early 2000 and so on. But as we -- as we as a state and with best business practices start to really define energy efficiency more broadly as you've heard other speakers say throughout the day, I assume, to include getting away or fill switching away from some of these carbon intensive resources that we can broaden that and it'll be a little bit harder to pull off and implement than to just putting a lightbulb and putting a new one in. But, you know, talking about switching out the water heaters and the windows and things like that on some of these older shells. That -- that I think would create a lot of benefit. But that's more

in the future, I guess, more Question 1 item anyhow.

Please, go ahead.

MR. JACOBSON: So opinion leadership in our community I think is incredibly important and I've certainly found out throughout the state which I think effectively boils down to trust. It's a trusting relationship, not only as an agency but as an individual. So I still -- there's a bowling alley in Eureka and although I don't manage or assess energy efficiency projects anymore, the operator of that bowling alley still calls me every time he has a question. It's like, can I talk to Lou? He says, hey, what kind of -- what kind of rebates are available? So seven years later, he still trusts that I'm going to give him an accurate read on what's available. And we find out that to be true across all of our energy techs and project managers.

Program certainty and continuity is also really, really important to sustain and build trust. So if I say hey, you can realize $1500 rebate for this -- this shade to pull [indiscernible] motor retrofit, six months down the line, that business owner should know it's still there or we should be clearly articulate that that rebate is changing and we expect that rebate to either sunset or be reduced with the next number of months. So really want to hit home that trust is really central here but that as we look at program design, program certainty and continuity plays into that trust

building.

Also on that theme, community-based social marketing. Through a number of different channels, low tech boots on the ground, community canvasing and talking works well for us as well. And then we do deploy no cost direct install services very much like you were saying, once you're there, you've already paid the incremental costs to get your technicians, your foot out in the community being able to deploy and deliver services at that moment really goes a long ways.

The last thing I'll say as far as trust goes and best practices for increasing participation is having a strong and robust database to track building factors over time. When you're serving communities that are either geographically hard to reach, hard to reach because of income status or whether or not listed on CalEnviroScreen, once you're in that community and you've built that trust and you're in that business or you're in that home, you should consider having your technicians, your project managers, your CEAs gather as many building factors as possible.

It's a little bit of additional work on the front side but as new technologies emerge, as new offerings come into the marketplace, you now have a robust database to be able to mine and then reach out and then let those consumers or ratepayers know that there's new offerings. Had you not collected that data, you wouldn't have that, you'd have to go

back out and, you know, assess the market a second time.

MR. KENNEY: Thank you. So this -- you can approach this from both ends, your roles, but also maybe as just energy efficiency fans. What changes do you see coming to energy efficiency program offerings either within your organization or generally in the near future? In response to new technologies or, you know, marketing of current technologies or just general market saturation of older technologies?

And just start here.

MR. JACOBSON: As I mentioned on the very first question, I think we're going to be moving towards distributed energy resources so. But we're a small community and we actually have a fairly large team on the demand side so we've been able to get out into the community and saturate the commercial sector. The residential sector's another question.

But what we see is of course with the DEER hours and the peak loads changing with the duck curve and the realities of RPS standard -- or RPS moving forward, we're really fired up to look at how advanced metering infrastructure, time of use, DEERs, and virtual power plants fit together so that we can move into -- move into the community, deploy smart technologies, aggregate those technologies in a way that save the consumer energy while maximizing the value to the grid

and of course to our abilities to procure renewable power over time.

MR. TAKEHARA: Yeah, so changes in the near future I see coming. I think you've probably heard all day long that you're going to hear things about, you know, decarbonization and new construction which I think is a great idea. Transportation, fill switching, things like that. The challenge that we're going to have at least in my community and possibly the north state is, you know, if you drive around Redding and Shasta Lake, things like that, you're going to see a lot of big pickup trucks. People have these things, they use them to haul big devices. And it's not a long three-hour commute where hybrids and EVs make a lot more sense, they're just in-town travel.

You may have an issue where they meet these folks, these families may not have the capital to spare resources to get a dedicated EV4 commuter vehicle. I notice a lot of folks that I work with drive around in their pickup trucks all day long, putting a lot of wear and tear on those things.

So there's just -- there's just a different perspective up here. So not to say it won't happen, I think the adoption way you're going to see go up, up and more, you know, new tax credits and whatnot. But you know, just something to be aware of.

The other thing that also concerns me due to recent

events is that the emphasis on electrification to decarbonize I think is a great policy objective. But the other thing to keep in mind is that we just had two major power outages that affected the wide swath in the north state. We're already a little bit in a bind. I live in a newer home that has natural gas heat, natural gas water heater, but guess what they require to actually operate electricity? And so when we're sitting there in the heat in July due to the Carr fire with no air conditioning and we're sitting in the cold due to the one foot of snow that fell at 800 feet that broke all the oak trees, there are a lot of people out there that were out of power for a week or more. So what do we do about this?

As we move toward a building code or a building practice that makes us 100 percent dependent on electricity and for the most part grid fuel -- grid-provided electricity. What does that mean when that 1 percent, 5 percent event happens? That's something I think needs to be added to the dialog. Probably not at the Energy Commission, per se, since you focus on energy like me but just kind of wanted to take the opportunity to get that out there.

But, you know, now having said that, we're obviously onboard as we move forward and Title 24 codes change, our city's implementing that thing where we're working real hard to see what kind of incentives that we can offer, looking at SMUD, trying to take as much good work as they've done in

offering those incentives to get people to not install the natural gas is something I plan to bring up to council and move forward. I think those are really good ideas. So.

Cooktops, though, I'm really worried about. One good way to fill a council chamber on a night, that's going to be one of the things.

MR. ARONSON: So it terms of Redding's current future portfolio and we'll continue to run with the low-income program as long as we can and the residential rebates are ticking along, the -- we get a lot of savings from commercial lighting still. I think we're where other utilities were, you know, five, seven, ten years ago. And so we're going to start seeing that saturate and we're going to have to backfill it with something.

To me, that's something the biggest most exciting thing is electrification. So. But there's just so much energy savings and efficiency to be gained by converting from natural gas to electric end uses through heat pumps that I think that's -- that's where I'm going to -- that's where I think we'll put our -- we'll put our eggs in that basket and hopefully that will be the next big thing that we can make up with our lighting savings from.

We're not -- and with electrification I think also we'll start to get some more storage capacity and demand response capabilities on top of the thermal storage that's

already out there. But I think that's the big direction we're headed.

MR. KENNEY: All right. And then just want to follow up kind of as you described your programs, what approach do you guys generally take for trying to quantify what the impacts have been and what maybe barriers do you have to do that and what -- what assistance do you think would be necessary to improve where you'd want to be.

Let's start with James on this one.

MR. TAKEHARA: Let's see, barriers to do the analysis. I mean, we rely on -- on the guidelines from the state when determining cost effectiveness just because we don't have the staff or the technical resources to develop our own methods.

The other one is going to be once you get these things implemented, how do you monitor to see if it's been successful or not. We could verify with our team that things are being actually installed, purchased, or washers and dryers are being removed, refrigerators and whatnot destroyed. Once we rebate something, make sure the old one doesn't end up in a garage.

But the thing that I thought was very interesting the previous panel was looking at consumer behavior of electricity second by second. The challenge that we're going to have as a government entity is that there's already been

court ruling saying that government shouldn't really do that due to the invasion of privacy issue. So looking at second by second is going to be a challenge. I think the court ruling I remember reading about was 15 minutes for commercial accounts and one hour for residential. So you're going to lose a little bit of that precision.

And then also the thing that we have is one meter on the house and so we don't know exactly what's causing -- necessarily causing the change in behavior from one hour to the next.

So that would be our biggest challenge in analyzing what's going on, we just don't have -- we haven't invested the resources, I don't know if we can or not. I have to think about whether or not we can do direct customer surveys and whether or not my customer base would actually respond to those surveys. I guess it depends on the incentives, huh?

So next question.

MR. ARONSON: So we -- well, we're not going back and looking at billing data to verify our energy savings other than our load forecasts which if you look at our load forecasts, our energy savings programs are doing great because our load is -- our weather [indiscernible] load is going down and down and down. So I think that that's a good indication that we're definitely having an impact on the electric system.

We also do M&B studies so we hire a consultant to come in, look at our processes, look at our assumptions that went into the -- into the, you know, quantifying the savings and then going out and doing field studies to kind of verify that things were installed and what we thought was installed is actually what was installed and all that.

I mean, that's valuable, we've -- we just did that on our lighting program last year and we're able to incorporate those lessons learned and insulation rate differences into our savings numbers that we're just about to file.

And then -- and I think -- I think that's an appropriate level. I mean, we'd rather spend the money and getting out in the customers and have them do work in their homes and businesses than on an academic study to really kind of find, you know, dial in what happened last year. You know, use it on just implement the findings into the future.

And then -- but the other thing we are doing is we're really trying to build some checks and balances into our processes. Our new programs have pretty extensive databases, we can always go back and look exactly what happened. We -- and we're much better about keeping all of our paperwork in order so that we -- it would be really hard to kind of just submit a receipt that had already been submitted for another rebate or some other way. So through continuous improvement, we're improving a quality of our programs, I think.

MR. JACOBSON: I think the only thing I can add is that most of our energy efficiency work right now is funded through a partnership with PG&E, our local government partnership, and our regional direct install services. So a lot of the M&V occurs with energy division staff with the California Public Utilities Commission. The -- and a lot of the measures we provide our community are prescriptive. Those that are not prescriptive are usually a custom calc where we have an EM&V process on the front side. And then often we'll do an expost review to confirm savings on the back side looking at the statewide custom incentive program requirements.

For our locally funded efforts, we have two of note right now, our public agency solar program which is about midstream so it would be premature to really talk about our plans on measurement and verification on that. But I will say the goal within that program is really to bring our critical infrastructure to a place where they -- they are likely at least zero net on their bills if not zero net energy all the way cross with the focus on resiliency in microgrids. But it is pretty premature to really talk about that because we don't have a fully hashed out M&V plan for the back side, we're waiting to see how the program advances in the coming months.

MR. KENNEY: All right. So just one final question

here.

What -- what recommendations would you have to the Energy Commission or other state agencies to either push policies you guys think need to be pushed or just to remove certain barriers that we've been discussing throughout the day here?

We'll start at the end here with Lou.

MR. JACOBSON: I was hoping I'd have some time to think.

Well, my life has been nothing but total resource cost for about a year now and how we can effectively move programs forward in rural California. They would have a TRC that exceeds one. I think the Energy Commission could facilitate a statewide conversation with the PUC, the Department of Water Resources, ARB, really discuss, you know, what appropriate measures of cost effectiveness would look like. Not saying that TRC isn't, but to have that conversation as if a societal cost test is it really looking at just the percent of administrator cost test. Is it a combination of all three? Are there different treatments for disadvantaged communities, hard to reach communities, rural communities, even urban communities that would level the playing field so that all economic actors in California had an equitable opportunity to access services. I don't know what the answer is, but I think the Energy Commission could

play a part in facilitating that conversation.

MR. KENNEY: Thank you.

MR. TAKEHARA: You know, from my perspective, I think what I would ask of the Energy Commission is maybe just echoing the last comment was coordinating across the other state agencies that managed very different roles as far as state policy. But to make sure that the policy objectives that are coming out and the program -- specific program elements consistent, one area I know that I was scratching my head about is the rooftop solar mandate yet, if you do certain things, then you can get a break on energy efficiency standards within that newly constructed home. And that one seemed a little bit odd to me. It just seemed like we -- maybe it's because we as utilities have been saying hey, if we're going to go solar, get energy out first and do as much energy efficiency as you can. So there's a little bit of a disconnect there, but I'm sure you had -- all had your reasons, I wasn't really part of that rulemaking.

The other thing, too, is more of a request to the Energy Commission is also, if you could, report -- coordination on data reporting. Not only finding the right balance of the information you need from all of these energy-related entities like utilities, but not overburdening us. Because if you continue to pile on certain reporting that's duplicative in a lot of ways, then that's less time you have

to actually go out in the field and get stuff done. So those would be my two -- two requests.

MR. KENNEY: All right.

MR. ARONSON: Well, I think one of the best things about working at a publically owned utility under, you know, kind of the direction of the CEC is that we get to exercise local control and do what's best for our community and that's fantastic. So keep -- keep allowing that, keep making that happen is a big one.

You know, I think another thing, it seems like California policies are leaning toward more of a carbon-based quantification methodology. And if that's -- if that's true, then, you know, I think that's a good thing and let's make that step. I think right now there's a little bit of uncertainty about how that's all coming together. And are we talking about energy efficiency or carbon reduction, which one helps the environment and how much. And we probably all have thoughts about that but let's kind of get that out there. And once we know the rules of the game, we can design around it.

MR. KENNEY: All right. Well, that's all the questions I think we have.

So now let's turn to the audience and if you have questions, if you can come up and use the mics here so that everybody who's online and in the room can hear. Does

anybody? Sean, can you come up?

MR. ARMSTRONG: Hi, this is Sean Armstrong again. I was wondering, have any of you three considered getting an electric vehicle that has ability to charge back the house?

Being a victim of all these rural power outages, I I've been thinking about getting a VIA pickup truck, for instance, that could charge a house so that you have a big old battery, power goes out, you're good for a day or two, if you got a solar rate, you're good for weeks.

Any thoughts in trying to make rural communities more resilient with reversible electric vehicles?

MR. ARONSON: So we've -- we've gotten that question a few times. And for us, we're trying to figure out how to get regular electric vehicles to a scale that it -- that it makes a difference. And once we start to have people adopting electric vehicles and that by mean -- might be means to an end as well. You know, I think that's a fantastic benefit of electric vehicles.

But realistically, we just -- we can't get chargers up here and we have a pretty slow electric vehicle update relative to some of the more populated areas.

MR. TAKEHARA: Yeah, I think we're facing the problem, the adoption rate. I haven't -- I -- since the time I've been there, I haven't received any inquiries about EV charging rebates or anything like that. I intent to roll one

out just to make sure it's available, right? But so far the adoption EVs just in general hasn't been there. So that's a challenge.

But I appreciate the question because the other thing that we're dealing with as a state that we are not ready for are the potential for these more frequent and prolonged power outages for public safety due to wildfire issues, right, the public safety shutoffs. I know PG&E is out there doing a lot of meetings with local jurisdictions and if you think about it, the two- to seven-day outages, that's not something society is really built for, so we're going to end up having to do some resiliency work here. That may be a good idea. I don't think we're there yet, especially up here, but certainly something to think about.

MR. JACOBSON: Internal, we are having vehicle -- vehicle to grid conversations in looking at EV as plug loads. However, from a programmatic perspective, we're aligning with Nathan and really just saying what we need -- we need to help increase adoption rate at EVs to begin with, we need to see incremental returns there, and we need to build out our EV charging infrastructure throughout Humboldt.

But internally, yeah, we are looking at vehicle to grid applications and looking at how we can integrate those into our services. And, you know, we're years out from that, though.

MR. ARMSTRONG: In vehicle to building.

MR. JACOBSON: Yes. Yeah, vehicle to grid the building. Yes.

MR. KENNEY: Any other questions from the audience? Or on the phone?

Well, if that's all, then thank you guys for your time.

All right. So now we're moving on to our final panel. But I think we have scheduling -- yeah. So let's go ahead and take a 15-minute break. Just stretch your legs, grab some water, and then we'll go into our final panel and closing.

[Off the record at 2:48 p.m.]

[On the record at 3:02 p.m.)

MR. KENNEY: Okay, everybody, so we're going to get started with the last of today's workshop, Capturing Energy Efficiency from Indoor Agriculture.

Our moderator for this panel will be Kevin Uy from the California Energy Commission.

MR. UY: All right. Well, thank you, everyone for joining us for the last panel of the day. I've got two of our panelists here with me who I'm going to introduce right now and then we'll jump right into the questions and let them get started.

But first off, I'm Kevin Uy, I'm with the Energy

Commission's research and development division. And I'm the program lead for a cap and trade program we run called the food production investment program. And that is a program that is specifically for California food producers to do energy efficiency and renewable energy projects at their facilities as long as they reduce energy consumption and greenhouse gas emissions.

But on the other side of the food processing is the agriculture and that's more what we're here to talk about today. And so joining us, we have Derrick Ross with the UC Davis Western Cooling Efficiency Center. So Derrick is a research and development engineer at the UC Davis Western Cooling Efficiency Center. He serves as a laboratory manager where he designs and conducts controlled experiments to characterizing promising emerging technology products for heating, ventilation, and air conditioning. Derrick received his bachelor's in mechanical engineering from the University of Florida and his master's in biomedical engineering from the University of California Davis. Upon graduating, he began working at the Western Cooling Efficiency Center.

And also joining us is Matt McGregor from SMUD. So Matt is a strategic account advisor with Sacramento Municipal Utility District, which is Sacramento's energy providing. Coming from 14 years of solution-based sales and customer service, most recently the renewable energy sector, it now

has day to day focuses on growing customer relationships and cultivating education and energy efficiency for his specialized customers. He's been working with horticultural industry since June 2016 and initiated the efforts SMUD put forth into testing LEDs and horticultural facilities.

All right. So I'm going to go into the first question, but please feel free to use this as an opportunity to also just introduce yourselves and your organization and where you are in this field.

But the first question is what role currently exists for your local utilities to assist indoor growing customers? Can indoor growing customers participate in energy efficiency programs?

And, you know just to set the context, what a lot of people are probably thinking about and is sort of the topic of the discussion today is the indoor cannabis growers who are going to be popping up all around the state. And there's sort of a unique opportunity to kind of get it right from the get-go, so to speak, in finding ways that they can implement efficiency technologies from the beginning, or those who are already growing, how they can, you know, do these retrofits.

So I'll let you start, Matt.

MR. MCGREGORY: Thank you, Kevin.

Yeah, honestly, I think Commissioner McAllister really didn't know how perfectly he hit the nail on the head

by talking about engagement. This industry has come on pretty hard and fast and kind of gone through a lull in the last year or so. But it was really a matter of taking an individual that wasn't really a business entity in the traditional sense, you know, out of a back bedroom or a two-car garage into a 100,000 square foot warehouse. And from the utility perspective, that scale means a lot of -- a lot of different energy implications.

So what does that scale look like? I mean, we're looking at 40,000 square foot warehouses that are now seeing about 1.5 megawatts of energy through them. And this is nothing something that was planned over years of time, this was something that kind of came in and contrite to our customer's beliefs, it's not just throwing the extension cord over the fence, really. It's just --

[Webex disconnects]

MR. UY: One second, I think we --

MR. MCGREGOR: I thought it was a little longer than that.

MR. UY: We might have lost the phone connection, so just give it one second.

[Pause in proceeding while Webex connects]

MR. UY: All right. Thank you, everyone, for bearing with us through this technical difficulties. Let's get right back to the panel and return back to Matt.

But just to remind everyone what the question was and it's -- it's what is the role that local utilities are playing to support indoor growing customers and how can they participate in the efficiency programs.

MR. MCGREGOR: Of course. And as we left, we were talking about engagement and really starting to dive into what facilities look like. So I mentioned that one facility around 40,000 square feet could potentially have about 1.5 megawatts of energy in order to do their process and such.

You know, if you rewind about two and a half years, I was stepping through my first facility and I really took the approach of, you know, we don't understand your process at this point. We want to learn better your specific needs so we can serve you better.

And I think our customers really took that to heart that there was an entity for honestly one of the first time. It was a government entity and that was willing to look at their process, discuss with them, and try to bring some performance or bring some assistance into the facility for them.

So again, the scale going from, you know, a two-car garage or a small warehouse base up to a, you know, thousands, tens of thousands of square foot warehouse obviously has different energy implications. Instead of

looking at a single or a couple smaller AC units, you're looking at a central in this nature.

But really the engagement is what the customers really took heart to. In those conversations I would really ask questions like hey, you know, have you looked at alternatives to your lighting? Have you looked at alternatives to your HVAC? Not saying well, why don't you use this? Why don't you use that? And it really did open discussion of what needed to happen within the industry in order to utilize the emerging technology the underutilize technology.

So the first question I had and they all kind of alluded into my question was, you know, like LEDs don't work. It's like, okay, it's interesting that you say that, like tell me a little bit more. Well, we tried them years ago and then our yields just went, you know, 30, 40 percent down. They're just not there. Be like, you know, using a ten-year-old laptop or buying a ten-year-old laptop, something of that nature.

So really, talking with more and more customers, they just laid the groundwork for us to ask the right questions, build some R&D projects around what they were curious about and, you know, move forward with those R&D projects, so it kind of went quiet for some customers but then we gained lot of information from them.

Looking back, could we change a couple of things? Could we monitor a couple of extra data points? Absolutely. But I think it was a really good scratching the surface on best practices for the facility and it was really based on that engagement that we had done. I still get emails probably once a month now from other jurisdictions, both within California, outside California about, you know, the SMUD studies, both in LEDs -- LED lighting and HVAC. But it's been really an interesting ride. I mean, if you rewind past that three years and said I was going to be doing this personally, then I would have told you you're crazy. But in fact I went home after that conversation with my supervisor the first day and told my wife, hey, I'm going to be doing this exclusively. What do you think? And she just starting laughing because I was like the Boy Scout all my life and everything. And to kind of be lumped into initially the stigma and the industry coming in line and such, it was -- it's been an interesting ride so far.

So your second question, can they participate in our programs? Absolutely. As an entity, as an enterprise, we really look at the industry completely agnostic, it's another commercial customer and they're looked at no differently. So myself, spending all of my time exclusively with our cannabis operations is really just a matter of portfolio. So we have portfolios based around our retail group, based around our

data center group, our critical infrastructure, our small and medium businesses. This is just the portfolio that I represent and I'm one of 25 strategic account advisors that does the exact same thing.

And we're starting to see a lot more uptake in adoption for our program as well our savings by design program.

MR. UY: Great. And Derrick, this question might not apply as much to you but maybe you could just use it as a chance to introduce what the Western Cooling Efficiency Center does with regards to indoor growing.

MR. ROSS: Yeah, so Derrick Ross here from the Western Cooling Efficiency Center at UC Davis. We've done a project in the past looking at more of the HVAC side, the technology side, looking at dehumidification for indoor grow rooms which are area specific and not typical application for humidification and I'll get into that a little bit more later.

MR. UY: Okay. Great.

And then the second question is really still more utility focus, but what best practices could you share to assist other local utilities seeking to assist indoor growing customers? So people come to them and they're -- or maybe the utilities seek them out because they see, you know, energy use go up a lot. You know, what advice to give to

other local utilities for how they can help those customers?

MR. MCGREGOR: Yeah, again it's really about the engagements and not just with our customers but with our colleagues and our brethren, really. It is dependent on the local jurisdiction is allowing a cannabis facility or cannabis operations to come into their territory, it could look a lot different.

So specifically to Sacramento, the city of Sacramento kind of had a come one, come all. And even though it was zoned in specific areas, specifically the industrial and the larger commercial zones, they really gave cart blanche for the facilities to come in.

One of our districts or one of our key bids specifically set out a cap of 2.5 million square feet of gross building space, dedicated specifically to cultivation. So that was one restriction that they had. But it was really from an overall from a territory base perspective, we're seeing such an influx and such a saturation of the customers. So we have about one area in Sacramento and our southern industrial part, the powering area sees about 60 to 65 percent of all of our cultivation. And when you start talking about one facility is 1.5 megawatts and there's a total of 200 proposed facilities coming in citywide, those numbers start to add up very quickly. So as a utility to stay on our toes, we really have to understand what our

infrastructure is currently, what our infrastructure can handle currently, what our customers are proposing, and what it's going to take to serve them as well.

Sharing that information -- really, a baseline facility is what people typically ask for when I get panged from another utility of like what does this -- what does the building look like from an energy perspective? What does the buildout look like? What do -- what's the customer base like are they used to certain technologies or non? And it's -- I unfortunately tell them it's the complete gamut. Some facilities are smaller or larger in size, some are more sophisticated, some are less sophisticated. Some are very on the cutting edge of technology. Some are so far on legacy technology that it just hurts to walk into their facility just -- or understand that it's an opportunity in the future to walk into.

When we start to look at the baseline, though, if you don't understand the facilities, they really -- you see a commercial building that's a shell, essentially, and there's like a refrigerated unit or a refrigerated -- like a walk-in refrigerator that could be anywhere from four to ten rooms and essentially it's going to run maybe up to about 2500 square feet per room. And that's where you see the most energy intense process. So it's the heaviest lighting, the heaviest HVAC, the largest or the end of their process and

such. So it sees that largest amount of energy.

One you start talking about one -- how those buildings are built out and such, then people start to understand on a microlevel of what's coming in. They kind of marry that information with what their city -- their local jurisdictions talking about. And then from the utility aspect, we aggregate all of that information together.

On the macro level is when we really start engaging with our planning and our design business units to better understand okay, what is this area going to look at from an infrastructure perspective? Can we handle 100 megawatts within this six-mile radius? How can we do that and such.

So those are a lot of the questions I get asked form other utilities.

COMMISSIONER MCALLISTER: Can I just ask a quick question? So is there a typical [indiscernible] that runs facilities [indiscernible] 24/7, like is there a [indiscernible] load in terms like [indiscernible] program like that?

MR. MCGREGOR: Yes, great question, actually.

MR. OBERG: Never asked that question ever.

MR. MCGREGOR: Right. Great question. For those on the phone if you did not hear is -- was there -- is there a specific load shape, load profile. There's actually two. And it's definitely dependent on preference with the

operators. Part of the process is a 12-hour photo period for the plants to actually grow. And that's the longest part of the process as well, it's during the flowering cycle. During the flowering cycle, if it's 12 hours, then you will either see a facility since it's about probably 80 percent of their production is within that 12-hour period. You're either going to see 100 percent of the facility on for 12 hours per day or you're going to see it completely flat because they've split. So they'll have half of the rooms on say midnight to noon and then the other on from noon to midnight.

So from a low profile, you might see a lit bump for -- I'm sorry, a little dip for about six hours or so for the other parts of the process that are an 18-hour photo period, but you could see it completely flat.

The opportunity there really is that you can have a facility because it's completely -- I'm sorry, I lost my train of thought. It's completely artificial that those off periods, if they want to go 100 percent at once can be during our peak. So you can have a facility if they're in a territory like ours where peak is anywhere from, you know, noon to 8 p.m., they can go from midnight to noon, be completely off peak with about a 30 percent base load for the lights off period and completely avoid a lot of their super -- or peak and super peak charges.

MR. UY: And Matt, just to give us some perspective,

you said 200 proposed growing facilities, one and half megawatts each. That's like 300 megawatts. What is that to SMUD's overall load?

MR. MCGREGOR: I probably should clarify there are different sizes on the facilities.

MR. UY: Right.

MR. MCGREGOR: The city of Sacramento will allow a single license to be up to 22,000 square feet of canopy. The 40,000-square foot facility essentially would be a single entity operating under a single license. The other license are, you know, up to 5,000 square feet and then five to ten thousand. So the 200 facilities come online are really a gamut of all of those licenses put together. I think the last time that I kind of put that pie graph together it was about 40 percent on the largest licenses and then 40 percent on the smallest licenses, and then some in the middle as well, about 20 percent or so.

If we averaged all that out, if everything came in proposed as they were proposing today, it would be about 150 megawatts. Given our I think peak load last year within the last five years or so, it would probably be around 3 to 5 percent of our overall peak load.

MR. UY: Yeah, but that's a significant amount, 3 to 5 percent --

MR. MCGREGOR: Yeah, coming online, absolutely.

MR. UY: Yeah. Great.

Well, for Question Number 3, let's go to Derrick.

What barriers do you see that are currently preventing further energy efficiency uptake by growers? So what's preventing them from just grabbing the most efficient technology and using that from the beginning?

MR. ROSS: Right. So I'd say definitely the initial lack of agreement between all the different operators and not knowing what is the most energy efficient or even disagreeing on what is most energy efficient.

And then even if they all did agree, you have the issue of upfront capital cost being typically pretty high. And then the fact that although it is legal in California at a federal level, it's still legal and therefore you can't really obtain financing in traditional methods for these operators.

And then as well as just unwilling to change typical methods because they're afraid of the profit losses. If I switch to LEDs, I'll see a drop in production or -- that's not what the big [indiscernible] are doing, therefore I'm not going to -- I'm not going to do that. Like I said, those are kind of the bigger ones I can think of.

MR. UY: Matt.

MR. MCGREGOR: Yeah, and honestly, Derrick hit on a lot of key points. There's a lot of lack of sophistication

and such. And really it is -- the industry has been so word of mouth. So if there is a small group that could all kind of rely on each other to go through that iterative process of R&D, too, what works best, then there's that agreement that they can share that information and the high tide float all boats.

The huge lack is really the data behind all of it. Any type of specialized system or manufacturer that's pitching a specialized system is really banking on the fact that they're going to get the guinea pig, they're going to get the, you know, small number of cultivators that are going to have success off of it and then spread that word of mouth. Because there isn't that real data. Even if they get the system installed and commissioned, it's going to be probably six months before a cycle is completed and then it's going to be, you know, months after that. So there's kind of some lead time in there.

I've unfortunately seen both sides of it so I've seen the word of mouth drives from decisions that were premature and the systems unfortunately failed and they weren't as successful but they were still sold to a number of people. And we also saw a lot of success off of it as well. So people are understanding now, you know, what the facility is going through from energy perspective, looking at their load profiles and saying okay, we had a spike right here. This

specific spike was due to our lights going off, the humidity rising pretty rapidly and our systems had to accommodate for that so that we could have a very small delta in temperature and humidity within the rooms.

The other barriers really just talking to the right people and understanding who's involved. Typically we see the trifecta of a grower, somebody that's going to be, you know, hands on the plants, soil under their fingers and such and has been doing it for years and years and years in whatever capacity.

You see some type of business oriented professional, so an accountant, an attorney, somebody that could kind of handle the business aspect of it and then we see a contractor, somebody that's in the skilled trades to physically build out the facility, maintain those larger systems that a lot of growers really weren't able to or didn't understand, they just knew they worked.

When you have that trifecta, it's really talking to the right person to better understand, okay, I need to talk to the grower first in order to kind of sell them on the idea that this is going to create their environment, this is going to create that -- that experience for their plans that they are looking for to create a successful crop. Because if they can't do that, then there's no financial gain to be hand.

Now you start talking to the business entity and say,

okay, we've talked to your grower, we've agreed that this is the best way, the most energy efficient way to deliver, you know, for round numbers 80 degrees and 60 percent of humidity within the space, here's what it looks like from a capex and there's what you're going to save on our operating expenditures and such.

So you start to put those all together and you get two pieces of a puzzle. And then typically costs comes in as well and that's where I introduce our programs. And our programs through as advising as well as incentives up front can decrease the amount of infrastructure needed up front so they're not increasing the size of their panel. They're installing smaller HVAC units, they're installing more energy efficient lighting, so they're automatically going to be saying down the road as well from an energy perspective.

MR. UY: And Derrick, we'll start with you for the next one, too.

Are you aware of emerging technologies coming out of current research and are they getting adopted by the market? I guess we've mentioned LEDs a lot, but it sounds like you have a lot more experience from the HVAC side.

MR. ROSS: Yeah, so we looked at it from the HVAC side and to kind of give everybody an idea of what the baseline scenario is, Matt touched on. So typically you have a larger building with smaller building within them. They're

kind of like chambers that they're growing all these different plants in. And sometimes they have minisplits, sometimes they have RTUs kind of from the HVAC side. And then the probably is that a typical air conditioning system is going to provide 70 percent sensible cooling and 30 percent dehumidification. But what you really want for indoor growing is actually kind of flip of that. Supply 30 percent sensible, 70 percent dehumidification.

And then so, they essentially walk down to the Costco, they buy a bunch of those roll empty humidifiers that you put in your basement and they plug in five or ten of those in the room in the center, if this will work. The probably that these are -- these are removing humidity from the room. But at the same time gradually adding more heat when you already have these high pressure sodium lights in there that are also pumping heat into this small enclosed airtight space. And before you know it, they're constantly running air conditioners in order to cool it.

So we looked at a new solution offered by MSP. And so unlike a traditional dehumidifier which would just be rolled into the room and is both ejecting heat to the room and then also pulling moisture out of the air, it's actually going splits the condenser and evaporator coil and that way you could actually put your condenser outside where you'd be rejecting heat to the outdoors which is a much more ideal

situation. And after testing it, we found that it actually provide that ideal 70 percent, dehumidification, 30 percent sensible cooling. And it's really nice because it decouples your dehumidification from your sensible heat removal. So you can just run this dehumidification, you know, during the night period you get a considerable amount of dehumidification with a little bit of cooling. And then during the day when you need more, you can use split system or something to add the additional cooling that you would typical need.

And then also we're aware of another company, Desert Air. We talked to them a few times, we haven't tested any of their equipment but they also offer similar split system for dehumidification. And just anecdotally talking to them, they said actually a sense delegalization in California is a large portion of their sales now. They used to do indoor pools, other high humidity applications, but actually indoor growing has become a major portion of their sales.

And that's kind of the HVAC side. But then you also have the LED lighting. I don't know as much about that. Ask Matt if you want to [indiscernible].

MR. MCGREGOR: And even to add a point to how polarize some of the buildouts are, they'll have a fleet of dehumidifiers when you walk in, you're like okay, there's a whole bunch of units in the room, okay, that's pretty

baseline. Then you start looking around like there's two humidifiers. And you start scratching your head. So you're dehumidifying and humidifying the same space at the same time. And they're, oh, yeah, it works great. It's like, okay. So that's my opportunity right there. Those are the types of things that we look into as well.

On the LED side, it's been really exciting to be honest. The -- the speed at which the technology has gotten better is just -- it's coming right at the right time as people are building out early conversations where Matt, these LEDs don't work. You know, I know you guys want us to be as energy efficient as possible, but they don't provide enough heat, you don't provide enough light. You know, every excuse under the board and kind of gave us the ammunition. But the manufacturers really have come to bat where they did a lot of testing not just to put out a product that was going to work but a product that was going to excel and that was going to outperform the legacy technology.

So you start to look at a solution that not only is it using less energy but it's providing the plants a better spectrum, it's providing the workers a better work environment. Because if you ever go through a facility, it's like being on the equator during the middle of the summer, per se, and putting magnifying glasses on you instead of, you know, sunglasses on. It's pretty bad.

And, you know, you put all these benefits together and you start to see success from our customers on it and you start to understand that the solutions our manufacturers are coming up with are working and they're great.

The design lights consortium has just rolled out their qualified products as well. So we're starting to jump ahead of some of the -- at least the efficiency standards. The fixtures are now UL listed, which a lot of times they weren't, they were built in Joe Bob's garage or wherever. And it's -- it really is gaining a lot of sophistication on the equipment side.

MR. UY: So it sounds like a lot of it is just legitimacy, today's growers to adopt the equipment is just seeing legitimate results.

Can you give us an idea of the savings that the LED lights have like to 1,000 watt equivalent, how much is an LED using?

MR. MCGREGOR: Yeah, typical one for one replacement would be about 600 watts. And I mean if you split that between the year, there's 12 hours per day every day of the year. So it's pretty significant.

MR. UY: Right. And then approximately some cooling savings as well.

MR. MCGREGOR: Absolutely.

MR. UY: Yeah.

MR. MCGREGOR: With the caveat that the plant is healthier under these lights because it's a higher quality light, they're getting a better environment, it's a better controlled environment that they are transpiring more so there is a lot more humidity in the room that needs to be removed. But with the right focus on that, I think the industry is going to catch up pretty soon.

MR. UY: Okay. Great. Great.

And then I guess this kind of builds on the last question but what challenges, if any, exists to researching more savings potential with indoor growing?

And if you don't have a great answer for that, maybe you can just say kind of what's your next step, what are you looking at research-wise for bringing efficiency even higher?

MR. ROSS: From a university perspective, it's kind of a gray area because we talked about this state version federal illegality. The last time we talked about it, the legal team was like, you can't touch any plants, it's kind of the hard line that they put on. Okay. We can work with that.

And then so assuming we even went through an additional study, finding willing funders is pretty difficult because, you know, everybody wants to improve efficiency for any kind of industry, including indoor growing. But what we're really talking about is growing cannabis and that is

problematic for people. If you're taking taxpayer dollars and using it to fund this, some people are upset by that.

And then I'm sure Matt has way more to talk about the subject, but having a controlled and stable environment, unless you're actually growing the plant yourself. But if you're going out to another operator of a grow facility and say please do A, B, and C and don't do anything else, we want this to be a controlled test. And I highly doubt that is going to occur.

MR. MCGREGOR: That could not have been said any better, to be honest.

There -- knowing that there are so many variables, I mean, we completed three of our studies and it was exactly that. There were multiple changes during the study that we weren't aware of. We would walk in and they said oh, yeah, we changed our set points five degrees because the plants are just doing really well. You're like, okay. Just kind of scratch your head that, you know, this is trying to be a controlled experiment and even though we had the conversation up front, you know, it was -- we did the best we could with the group that we had.

And honestly, they were great letting us in the door and agreeing to doing it, taking on a lot of risk upon ourselves.

I think a big challenge, too, is really the data

perspective and getting to that best practice knowing that it is especially across California and across the country, you know, more and more as time goes on, it is such a great opportunity to get people up front. But in order to do that, we really have to have that research sound. I mean, we have a couple of samples. And as much as people look to it, it really is a small sample size. And better understanding the facilities as emerging technology comes out. I think it's going to be kind of how to staying involved within the facilities as well.

MR. UY: And was that LED research from SMUD self-funded, that was just funding internally?

MR. MCGREGOR: Correct.

MR. UY: Yeah. Okay. And what about the project that you did with the split humidifiers, Derrick, was that -- where did the funding from that come from?

MR. ROSS: That was funded by the manufacturer by MSP.

MR. UY: Okay. So no public funding yet, it sounds like.

Well I guess that brings us to the last question but it's -- and maybe it's not funding but how can the Energy Commission address energy efficiency issues in the indoor growing sector and are there other state agencies that could help? Any thoughts on that.

MR. ROSS: So I would definitely agree that funding would be great for projects as we know. It's not going to come from the federal level, that will not happen. So any state level entity that want to fund projects to help this problem with, you know, the one of the most energy intensive industries in California, that would be great. And we're looking forward to seeing a GFO, you know.

MR. MCGREGOR: I think it really comes down to the engagement again knowing that this industry is coming online. And it's really in its infancy yet. I wouldn't say it's in its adolescence at this point because not enough of the facilities at least in our territory are online yet. We need to better understand the facilities before we start pursing any type of code. And once we do, I would say we really need to get the correct stakeholders in the room, people that have been involved in the industry in whatever capacity for years and years and years to understand what those code implications are going to look at within their facilities.

The -- knowing that it is industrial process, the piece that we really miss is the widget. Is, okay, I'm using all of this energy, but how much am I producing off of it? And that could -- we could have two mirrored facilities and energy use, they're built out exactly the same but they could be -- there could be a 20 percent delta between what they're

producing just because it's an organic process. I shouldn't say organic from a federal, you know, aspect, but it's a process, it's a biological process, so there's going to be some delta in there.

But really once we start talking about code is to get the best stakeholders in the room that we can to better understand the facilities.

COMMISSIONER MCALLISTER: [Indiscernible.]

MR. UY: Yeah, please.

COMMISSIOINER MCALLISER: Just a couple of questions. Oh, sorry.

So really, really question -- oh, thanks. What is -- so do you check to see if they're legit. Like my understanding is that well over half of the grow in the state is still for the illicit market. Right? And so I'm kind of wondering if you have any sense of how legalization has sort of affected the overall market? Any of that would affect the savings potential, the access we have to those different growers and stuff. So I'm assuming that like there's, you know, they can't set up a facility until they get a license and all that.

But I'm just wondering if you have a sense for that. So that's one.

And then number two, are there -- do you also work with the industrial processes that are -- you know, the

postprofessing so they harvest, you know, and then they're making CBD or they, you know, they've got some kind of process to actually industrial the product itself. So I'm wondering if you see any opportunities there.

MR. MCGREGOR: Uh-huh. So I think upfront it's really not our jurisdiction to get into the legality of the facilities. They're our customers and we hold their information private and such. There obviously is going to be that gray area as people begin to build out of do they have their local jurisdiction license or permitting, do they have their state licensing and such. And there were definitely conversations I had early on that the facility or the individuals in charge of it did not come to fruition. So I would see them inquiry, essentially that's where the process would start and I wouldn't see any application for the permitting, I wouldn't see any application for the licensing and such, but then they would slowly go away.

In that instance, we -- I actually very closely watched their conditional use permitting, their business operating permits, their building permits, their state licensing to better understand the milestones that those customers are hitting so I can understand when they're going to be coming online, how much they're going to be coming online, how much energy they're going to be using. Really their ramp up so we can plan accordingly. And that

information I share internally. So say my planning department can plan accordingly. Our design department can make sure that certain jobs are moving forward as needed.

But there's definitely that aspect of legitimacy that the industry is trying to go towards. So we're not really seeing a lot of the quote, unquote bad players. Their -- they don't engage with the utilities or with myself, at least, as well as more and more people are going toward that legitimate aspect that we're -- I'm not seeing as much.

And then to your second question, yeah, there's --

UNKNOWN SPEAKER: That one we have no problem with [indiscernible].

COMMISSIONER MCALLISTER: The reason I ask is that we have at the state, we have similar issues. All right. We get fair amount of money from the federal government, right? And if we're going to develop code and we're going to be sort of open about the fact that we're targeting cannabis, we have to be careful to tiptoe around that difference as well. So I think that that's something that the industrial that collectively we're going to need to think about how much risk we're willing to take, really.

MR. MCGREGOR: Of course.

COMMISISONER MCALLISTER: And how much we're willing to potentially compromise the money we get for low-income weatherization or the money we get for, you know, other

things from the feds.

MR. MCGREGOR: Uh-huh.

COMMISSIONER MCALLISTER: So, you know, that's going to be with us for a while so anyway, so industrialization.

MR. MCGREGOR: Well, then to take that a step further there are -- so the Bureau of Cannabis Control is run aby the same individual that was putting together or was director of the alcohol beverage control. So there's a lot of those controls that are in line with the cannabis industry as well.

There's there different entities under there so the Bureau of Cannabis Control, the Office of Manufactured Cannabis, and the California Department of Food and Agriculture that would manage all the cultivation facilities. So it's dependent on the business model, there are different entities that are regulating them.

They have been very good about putting all the information really out to understand which facilities are licensed so we constantly check to see those, like I was saying. And you could do the exact same thing where you're understanding okay, this facility has gone through all of its licensing, they have their permanent license, and you know, they would be less risk, I should say to walk through or to engage with.

I would imagine in that aspect as well that you would want to see the facilities that are operational, that are

actually using the energy, not just proposing a facility that hasn't come online yet. And those would definitely be on the side of legitimacy because they are -- really every state agency from the building department, fire code enforcement are given carte blanche to walk through the facilities at any point. So there's -- it really is not in their best interest knowing how much they're taxed, all the fees are to really bend or break any of those rules.

The secondary market is really interesting as well. It's not as energy intense but it's the extraction of all of the chemical compounds that are within the plant or the byproduct of the plant material once its primary product is taken out and say sense to a dispensary or wholesaler. And that's where we're starting to see a lot more interest as well. So is it on the specific extraction utilizing ethanol, CO_2 or hydrocarbons. Is it into the beverage making, into the infusions, all of those and such that we're starting to see that that's a brand new industry but all of the infusions and the commercial bakeries and the beverage or bottling facilities, those are really just adding an extra ingredient. But on the extraction side, that's where we're starting to gain a lot more knowledge on it, what works best for the operators as more facilities are becoming more recreational.

COMMISISONER MCALLISTER: Thanks.

MR. MCGREGOR: You're welcome.

MR. UY: Great. Well, I guess that would open it up to other questions from the audience if there are any for our two panelists. Or if there are any online. All right.

Well I guess -- I guess unless if there's any other questions, that about wraps it up.

Did you guys have some last thoughts, though, on, you know, anything to do with the discussion today?

MR. MCGREGOR: I don't, no.

MR. UY: Well, then, I'd like to thank our two panelists for their --

And I believe Michael has some closing remarks.

MR. KENNEY: All right. So I'd just like to give a big thank you to everybody who was on the panelists today and was in the audience today. This information is critical to the actual plan we're going to be working on throughout the rest of this year.

Before I kind of dive into some last-minute instructions, I just wanted to open it up for a few minutes if people had any closing comments on anything that we discussed today. Come up to the mic and put those down. So I'd like to open the floor up to that.

If there are no takers, then I'd just like to reiterate that we have the docket open, so please go on to our website, the links are available here on this slide. We can also send them to you, they're in the workshop notice.

We have specific questions as I mentioned earlier today that we'd like input on. A lot of you have expertise that we don't. And the actual plan we're working on is only going to be as good as the information we can collect from are of kind of high of mind throughout the state.

So please look at those questions, leave your thoughts about the topics from today's panel in the docket as well. That really helps us write this report. And those will be open till May 15th.

With that, we'll hit the ground running writing this report. So look -- look for a draft of that sometime mid to late summer. Shooting to have this thing finalized and adopted in the fall so then that would be our action plan for the state moving forward that we'll be updating periodically. So.

Again, thanks to Redding Electric to hosting us and we look forward to, you know, talking with them in the future and with all of you here. So thank you.

(Thereupon, the hearing was adjourned at 3:48 p.m.)

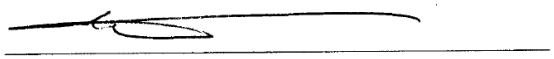
--oOo--

REPORTER'S CERTIFICATE

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

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

IN WITNESS WHEREOF, I have hereunto set my hand this 6th day of May, 2019.



PETER PETTY
CER**D-493
Notary Public

TRANSCRIBER'S CERTIFICATE

I do hereby certify that the testimony in the foregoing hearing was taken at the time and place therein stated; that the testimony of said witnesses were transcribed by me, a certified transcriber.

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 6th day of May, 2019.

Jill Jacoby
Certified Transcriber
AAERT No. CERT**D-633