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STATE of CALIFORNIA

CALIFORNIA ENERGY COMMISSION

In the Matter of:	)	Docket No. 21-IEPR-06
	)	
	)	
2021 Integrated Energy Policy Report (2021 IEPR)	)	Re: Building Decarbonization, Consumers, Financing and Workforce

IEPR COMMISSIONER WORKSHOP ON BUILDING DECARBONIZATION - CONSUMERS, FINANCING, AND WORKFORCE

REMOTE ACCESS ONLY

TUESDAY, JULY 13, 2021
SESSION 3 OF 3: Decarbonization and Workforce

9:00 A.M

Reported By:
Martha Nelson

APPEARANCES

Workshop Leadership:

Andrew McAllister, Commissioner CEC
Patricia Monahan, Commissioner CEC
Siva Gunda, Commissioner CEC
Genevieve Shiroma, Commissioner, California Public Utilities Commission (CPUC)
Derek Chernow, Executive Director, California Alternative Energy & Advanced Transportation Authority (CAEATFA), California Pollution Control Financing Authority (CPFCA)

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Heather Raitt, IEPR Program Manager, CEC
Noemí Gallardo, Public Advisor, CEC
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Gabriel Taylor, CEC
Kristy Chew, CEC

Presenters

Tony G. Reames, Department of Energy
Sarah White, Governor's Office of Planning and Research

Panel Members:

Panel: Workforce Needs and Opportunities
Moderator: Gabriel Taylor, CEC

David Roland-Holst, U.C. Berkeley
Philip Jordan, BW Research Partnership
Neha Bazaj, Emerald Cities Collaborative
Cori Jackson, U.C. Davis

APPEARANCES (Cont.)

Panel Members: (Cont.)

Panel: Current and Future Workforce and Training Ecosystem
Moderator: Shrayas Jatkar, California Workforce Development Board

Julia Hatton, Rising Sun Center for Opportunity
Randy Young, Sheet Metal Workers Local 104

Public Comment:

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P R O C E E D I N G S

JULY 13, 2021 9:00 a.m.

(On the record at 9:00 a.m.)

MS. RAITT: All right, good morning everybody. Welcome to today's 2021 IEPR Commissioner Workshop on Building Decarbonization: Consumers, Financing, and Workforce. I'm Heather Raitt the Program Manager for the Integrated Energy Policy Report, or the IEPR.

This workshop is being held remotely consistent with Executive Order N-08-21 to continue to help California respond to, recover from, and mitigate the impacts of the COVID-19 pandemic.

The public can participate in the workshop consistent with the direction in the Executive Order. This workshop is being held over two days. Yesterday we had the first two sessions, and this is the third and final session.

To follow-along the schedule, and slide decks are posted on the CEC's website. All IEPR workshops are recorded and both a written and audio recording will be linked on the Energy Commission's website.

Attendees have the opportunity to participate today in a few different ways. For those joining through the online Zoom platform, the Q&A feature is available for you to submit questions. You may also upvote a question

submitted by someone else. To do that click the thumbs-up icon. Questions with the most upvotes are moved to the top of the queue. So we'll be taking some questions after each of the panels today. We'll reserve a few minutes to do so. We may not have time to respond to all questions submitted through the Q&A.

Alternatively, attendees may make comments during the public comment period at the end of the morning. Please note that we will not be responding to questions during that public comment period.

Written comments are also welcome and instructions for doing so are in the workshop notice. Written comments are due on July 27th.

And with that I'll turn it over to Commissioner Andrew McAllister for opening remarks. Thank you, Commissioner.

COMMISSIONER MCALLISTER: Thank you, Heather.

It's a pleasure to be here and I'm really gratified to be hosting the second day of our building decarbonization workshop series. And first of all I want to just thank you and your team and the Division staffs from the Efficiency Division primarily for today and yesterday, and for last week the Assessments Division. We also had two days of workshops, very productive workshops on reliability of our electricity and gas systems. So I

just wanted to acknowledge the marathon of workshops that we've been having lately and just really express gratitude to you and your team for all the work that goes behind these. They come off seamlessly and that's because of your professionalism and just incredibly high level of competence, so thank you.

So today, we're wrapping up our series on decarbonization. Yesterday we did consumer perspectives in the morning and financing in the afternoon, both very substantive. And I think we've been taking pains all along really throughout the IEPR cycle and throughout the Commission really to make equity and inclusiveness a centerpiece of everything we're doing in our energy transition work at the Commission and really across the agencies. And you'll see that again today.

So I want to acknowledge all of the attendees, good attendance today as well, and hopefully some good participation from our attendees. And an expression of how important this issue is, is the fact that we have on the dais some counterparts from our sister agencies.

I want to acknowledge Commissioner Genevieve Shiroma from the PUC is here with us, thank you very much. And Derek Chernow who is here from CAEATFA who joined us for the entire day yesterday, and welcome again today Derek. And my colleagues at the Energy Commission,

Commissioner Siva Gunda and Commissioner Patty Monahan, so thanks to both of you for being here as well.

So with that I wanted to just high-level express we know that buildings are key to our decarbonization journey and in a number of ways, in an increasingly broad number of ways, in multiple ways. So, of course, they have emissions themselves. So it can be electricity that they consume, that consumed within them, and the gas that is consumed directly onsite in our buildings. So those are direct emissions.

Buildings are also evolving to be key parts of grid stability and reliability. And so the smarts, the temporal variation in their consumption, the platform that they are for all of the various things that humans do. We spend most of our times in and around buildings, and they really are the locus of human activity. And so there's a very large and growing kind of appreciation of the behavioral aspects around buildings.

And so luckily, we live in the 21st century. Our economy is largely digitized and that brings all sorts of new tools to the table. And those tools have to be utilized properly and installed properly. And the level of competence of the workforce has to be there in order to really realize all these potential decarbonization benefits.

So if we look at equity, decarbonization and equity in our buildings and our workforce, a lot of things are going to have to work in synchronicity to leverage, to realize all these potential benefits. So there are huge potential benefits.

But as we grow our electricity consumption, as we double or even triple it over the next coming decades we really have -- I think it's imperative that we have to get the projects right. We have to install the most efficient equipment, and equipment that can relate directly to the grid. That can be grid interactive in the full sense of the word. And so these technologies require a trained, highly competent workforce that's inclusive.

Yesterday we talked about the communities throughout the state. We have an incredibly diverse state. And each of those communities needs to be engaged directly in a substantive way. The context varies tremendously across our big, beautiful, diverse state of 40 million people and many, many dozens of cultures and languages. And an incredible array of economic diversity, large inequities, large challenges. But we have to find ways to be inclusive.

So I'm spewing out a lot of interrelated things, but I think that partly what ties it all together is the workforce. Customers aren't the experts. It's going to

have to be that it touches with the workforce, the contractor community and local community leaders that work together to get good projects done across the state.

So with that I think we're going to talk about a lot of these issues today. I really invite my colleagues on the dais to ask all the questions they can. So we have some great moderators today. And also we have Tony Reames from the Department of Energy who's going to help kick us off.

I really appreciate the engagement at the federal level now with the Biden Administration. There's such good alignment between what we're trying to do in California and the vision that the Biden Administration has for our buildings going forward and really a great, great synergy there.

So I'm very much looking forward to today, and with that I'll pass it to Heather to get us started with our presentation from Tony Reames from the Department of Energy. But thanks everyone, for being here today.

Well, actually I don't want to neglect my colleagues on the dais. If anyone has some opening comments they'd like to make. Commissioners Gunda, not sure if a Commissioner Monahan is with us quite yet, or Commissioner Shiroma or Derek Chernow.

COMMISSIONER GUNDA: Yes, I will just add one

small thing there. I was happy to go to the keynote, but I'm just going to use the time. I think I really wanted to take the opportunity to just thank you and appreciate your leadership on this.

I think the work that you kicked off last year in 3232, the building codes that we are working on, and then more broadly the LMS work that you're trying to develop, load management standards. I think really underpins the future for the state in terms of really giving all the tools to decarbonize the buildings.

And, you know, at CPUC Commissioner Shiroma has been taking lead on a number of these things and I'm just incredibly thankful for the partnership between the two agencies. And great to be on the dais with Derek the last day. It's wonderful to make his acquaintance as well.

So I think to your point, Commission McAllister, I think the needs for electrification were well established yesterday. I think that needs for equity were well established yesterday. And I wanted to just raise a couple things that we heard yesterday as we conclude today, which is from a consumer perspective on equity there has been a real ask for de-siloing the programs and improving the integratedness and comprehensiveness of thinking through solutions holistically to both a skilled (indiscernible) that would also reduce the overall costs.

We talked about benefits of reporting in kind of an overarching comprehensive way, rather than a siloed fashion. And then we still kind of think through -- you know, not just think through some of the parts individually, but as a whole was a key discussion point yesterday.

We also heard a little bit about the opportunities with non-energy benefits and how do we model it and how difficult it is. And just the acknowledgement it's very difficult, but we need to do it.

And there was the idea of financing about how do we increase the power of financing, make it more diverse to move these comprehensive solutions forward. So I think a lot of interesting ideas came yesterday, and thanks to the panelists yesterday for all their thoughtfulness in providing this information.

So with that I'm just looking forward to the rest of the day today. And then I think workforce is an important element. And I know I'm familiar with the number of colleagues that are going to speak today and just looking forward to hearing their thoughts.

COMMISSIONER MCALLISTER: Great.

Commissioner Shiroma, would you like to kick us off with some comments?

COMMISSIONER SHIROMA: Yes, yes, thank you. I

also want to echo thanks to you, Commissioner McAllister, on your leadership on building decarbonization and this very important workforce discussion.

It's a pleasure to join you Commissioner Gunda, Commissioner Monahan, and Executive Director Derek Chernow from our Treasurer's Office. We will learn together about the needs of California's workforce, their essential role in this effort.

Although I could not join yesterday's workshop on financing decarbonization my team attended and reported back on the presentations and discussions. And as Commissioner Gunda mentioned the dovetailing of the Energy Commission and CPUC's financing efforts are really key to the overall success. Building decarbonization requires energy efficiency, financing of those investments, and people-power to achieve our climate goals.

As the assigned Commissioner at the CPUC for energy efficiency and clean-energy financing proceedings I'm keenly interested in learning more about the impacts on California's workforce, employment sectors, and the creation of accessible high-quality jobs as we do strive to achieve our very ambitious climate goals.

An important factor as we transition to implementing building electrification initiatives is equity, as was heavily discussed yesterday.

I'm also the assigned Commissioner for the California Alternate Rates for Energy, the CARE Program, the Family Electric Rate Assistance Program, or FERA, and Energy Savings Assistance. These are our discount programs for low-income customers. The ESA program provides at no cost to customers, weatherization services, energy efficiency measures, and energy education. We approved recently $11 billion for the CARE, FERA, ESA program. The four large investor-owned utilities are looking to treat over one million homes by the end of 2026.

In October of last year following Governor Newsom's Executive Order to accelerate climate change mitigations, building a more sustainable and inclusive economy, the CPUC and the California Workforce Development Board -- and we'll hear more from them later -- we executed an MOU, a Memorandum of Understanding. To ensure investments in clean energy and transportation sustainability result in accessible, high-quality jobs and greater access to career opportunities for disadvantaged Californians.

The decision I mentioned previously, about the $11 billion investment also requires the investor owned utilities to ensure additional workforce development opportunities hiring within local communities. And specifically in disadvantaged communities again, in

partnership with the California Workforce Development Board's energy and climate jobs, initiatives, and community colleges. We hope to really bring that to fruition in all four corners of what we do beyond building decarbonization, also vegetation management, transportation, electrification, and so forth.

Overall I'm looking forward to today's discussion to learn further what else can we do for education, training opportunities, for the contractors, again creation of high-quality jobs, accessible jobs, high-paying jobs. And in particularly in the rural, hard-to-reach, disadvantaged communities.

Thank you. I look forward to the conversation today.

COMMISSIONER MCALLISTER: Thank you so much, Commissioner Shiroma. And thank you for your leadership in all of those areas. It's so clear that we have many, many bridges between us already and we can take advantage of those to find solutions and implement them together so thank you so, so much. And for being here today as well.

Executive Director, Derek Chernow, from the California Alternative Energy and Advanced Transportation Financing Authority, CAEATFA, would you care to make any opening comments as well? Thanks again for being here.

EXECUTIVE DIRECTOR CHERNOW: Yeah, thank you.

And I'll just echo what the Commissioners have mentioned. And it was exciting yesterday to hear the all-of-the-above approach that California is taking in meeting our decarbonization goals. And getting our residences and office buildings to where they should be for energy efficiency. And whether it's grants, incentives, loans, leveraging the private sector, leveraging our public sector dollars and expertise, it was really exciting to hear all of the programs that are taking place and up and down the state.

And I think looking forward it's important, I think, for the participants to understand what you see here over the past couple days is also a strong working relationship between state agencies: between the PUC and the Energy Commission, the Treasurer's Office, Workforce Development Board. This is high on everybody's agenda. It's high on everybody's agenda, both for the environmental impact as well as for the economic and workforce impact. So I'm thrilled to be part of this and looking forward to hearing how we transition to this, our workforce into meeting the job demands put forward as we decarbonize, so thank you very much.

COMMISSIONER MCALLISTER: Thank you very much for being here.

So without further ado, I wanted to pass it back

to Heather and introduce our morning keynote Tony Reames from the Department of Energy. Thanks, Tony, for being with us. Go ahead, Heather.

MS. RAITT: Okay, great. So Tony Reames is a Senior Advisor in the Office of Economic Impacts and Diversity at the Department of Energy. And previously Tony was a Professor of Environment and Sustainability at the University of Michigan where he established the Urban Energy Justice Lab to conduct research and developed solutions on the production and persistence of racial, income, and geographic disparities in energy access, affordability, decision-making, and participation.

Tony also served as a commissioned officer in the U.S. Army Corps of Engineers and worked in both the private and public sectors as a licensed professional engineer. So we're very happy to have you here. Thanks for being here. Go ahead.

MR. REAMES: All right, thank you so much, Heather, for that introduction, and Commission McAllister for your comments as well as the other Commissioners.

I'm excited to be with you all today. Just last month this time, I was a professor at the University of Michigan. And now in this role in the Department of Energy in the Office of Economic Impact and Diversity providing

policy analysis, leadership on energy justice.

I just wanted to frame a little bit the role of the Office of Economic Impact and Diversity before I jump into the presentation. The Office was actually created kind of coming out of the energy crisis in the 1970s, so a statute created the Office of Minority Impacts in 1978. We have kind of five key areas that we advise on within the Department of Energy.

First, advising the Secretary on energy policies, regulations and how those impact black, indigenous, and communities of color. We have a relationship with the Energy Information Administration to actually do research and data collection on how energy policy affects communities of color. And then offer policy recommendations that are appropriate to relieve impacts on communities of color. Continuous assessment of the relationship between energy and communities of color. And then work on technical assistance and job creation, particularly for overburdened and underinvested communities. Next slide, please.

So I think it's no surprise to anyone on this call today that we are living in the United States of Energy Insecurity. Diana Hernandez, a professor at Columbia University, defines energy insecurity as the inability to adequately meet a household's energy needs.

And it also includes these physical, economic, and behavioral dimensions that can lead to or exacerbate adverse health issues. Next slide, please.

And so we're all familiar with the challenges that we face in our energy sector across the country, some shared experiences and some that are very unique depending on where you live. I was just without power for about four days here in Michigan after we had a really heavy windstorm. And so you know, energy insecurity is very real to my mind and the work we're doing at the Department.

And so we know that millions of Americans are racking up debt, whether it's in their utility bills for energy or water. And as shut-off moratoriums come to an end, how do we begin to address that issue? We all remember what happened in Texas and California. And you all have your own experiences with storms, and how that can take out power for people. And how that impact is disproportionate across low-income communities and communities of color.

And we know that these energy challenges can also be deadly. Here in Michigan when it gets really cold we see experiences of people dying in their home, because they can't keep their utilities on. And so I posted a story here of a mother and son that were both found dead inside a cold home. Next slide, please.

And so working with the U.S. Energy Information Administration our last residential energy consumption survey included questions on this issue of energy insecurity, and we know that the 2020 version of that survey will allow us to do additional analysis on the challenges of energy insecurity across our country.

And so what we learned a few years ago is that one in three household face some form of energy insecurity. One in five households actually reduced or forwent basic necessities like food and medicine just to be able to pay their energy bills. Fourteen percent of households reported receiving a disconnect notice. And eleven percent of households kept their home at unhealthy temperatures, whether too hot or too cold, just to be able to afford their energy.

The graph on the right shows that these disparities are not equal across populations, especially when we look at race and ethnicity. And so we see black households, Latinx households, Asian-American households, Alaskan Native, Pacific Islander, and biracial households are experiencing this at a much greater proportions than just the average U.S. household. Next slide, please.

And we know that the pandemic worsened energy insecurity. A study out of Indiana University found that at the height of the pandemic back in May of last year

disparities were growing in the experience of shut-off and inability to pay household energy bills. And we saw groups like people living in inefficient housing, which I think is so important to the conversation today.

We're really experiencing this at greater levels compared to those who have more efficient housing. Medical people with medical devices, homes with children under five, and again racial disparities. And kind of the exacerbation of energy insecurity during the pandemic by Hispanic, Latinx households, and black households. Next slide, please.

And so there are these buckets of challenges, so the affordability issue is caught up in a host of other issues that we're trying to deal with: urban-rural divide, challenges 2 infinity, institutional racism, economic crisis, aging infrastructure, the climate crisis. Next slide, please.

But our energy transition, while not a panacea, it offers us some rays of hope, right? How do we begin to address these challenges and address them in an equitable way. Next slide, please.

And so our question at DOE, and what we're dealing with in the Office of Economic Impact and Diversity, is how do we simultaneously transform our energy system, but at the same time ensure that our system is more

equitable and just? Next slide, please.

And so what is this just, equitable energy system that we're thinking about? It's a system that fairly disseminates both the benefits and cost of energy services. And it also has representativeness and impartial decision-making when it comes to all of these decisions that we're going to need to make as we transition the system. Next slide, please.

And so there are kind of four tenets to energy justice. We have Recognition Justice, so recognizing the various vulnerabilities of populations, which you all have done in California with your disadvantaged communities designations. Distributional Justice, really understanding the challenges and how that is distributed across populations. Procedural Justice, beginning to get people engaged and involved in the process and making sure that engagement is authentic. And then Corrective Justice, this is where we create the policies and programs and procedures that are equitable whether it's new solar for all programs, engaging in energy democracy, rates that are based on people's ability to actually afford them and pay for them. Next slide, please.

And so we're really excited. So what are we doing at the federal government when it comes to addressing the issues of energy inequities? President Biden is

committed to environmental justice and really taken an approach to address communities that have borne the burden of our energy system, the burden of underinvestment. And really say that we are going to take an equity-based approach to investing in our communities.

And so with Executive Order 14008, Section 223 established the Justice 40 Initiative. This is a historic initiative that is going to be a whole-of-government approach to really address energy justice, environmental justice, and climate justice at the same time while centering our energy transition and the ambitions within future appropriations, centering that around equity. Next slide, please.

So what is Justice 40? The Justice 40 Initiative says that 40 percent of overall benefits of certain federal investments, most of them being climate and energy investments, must flow to disadvantaged communities.

And so within those three buckets how are we approaching this?

First, we have to identify how we measure and track the benefits of Justice 40. How we define what Justice 40 investments are. And then how we define who disadvantaged communities are. And so each agency, and particularly in DOE, we are going through this process now looking to states and localities who have been doing this

work to really begin to define that across the country, focused on federal investments. Next slide, please.

And so within DOE what are our kind of Justice 40 policy priorities when we think about the opportunities for investment in disadvantaged communities. You know, throughout our time what are some of the goals that we want to establish? And so I talked about energy insecurity, and so one primary goal is for us to really find ways that we can reduce and decrease energy burdens in disadvantaged communities.

Second, we want to create clean-energy technology in storage, solar, other renewable energy, create parity and increase clean-energy access in communities that have not had that access.

We want to increase capital, low-cost capital in disadvantaged communities, so they can participate in clean energy and reduce energy burdens.

We also want to do enterprise creation. So how do we find ways to accelerate minority businesses and diverse businesses acceleration?

Increase clean-energy pipelines and job training.

Increase energy resiliency.

And then also get people engaged in the energy transition. Next slide, please.

And so Justice 40 is our way to do that. It

provides a pathway for equitable deep decarbonization that focuses on equitable deep decarbonization and hope that it transforms and builds wealth in underserved and under-burdened communities. Next slide, please.

And so what are some of the components to this idea of equitable deep decarbonization, which I think are important and key to the conversation you all have been having yesterday and today? It is that we must look at distributed clean energy and it must be done in an equitable way. There is a role for utility scale energy, and how to ensure that that type of investment actually benefits the communities that utilities serve, focusing heavily on making our buildings more efficient, both our residential and commercial buildings.

How do we take a place-based approach to going through communities and making our buildings as smart, as clean, as efficient as possible? A focus on clean transit and the role of clean transit to equitably push for decarbonization.

Workforce development through new manufacturing, through other investment in communities.

And then again, acceleration of minority business enterprise, diverse business enterprises.

And then the goal, overarching goal of reducing our greenhouse gas emissions and other co-pollutants. Next

slide, please.

And so how do we approach this? We're very focused on an all-hands approach to this, a layered community-centered place-based approach. We want people to be able to see things happening in their communities. And we know as a federal government we can't do that alone. And so taking advantage of what we are good at and making sure that's more equitable in both our research and development, our technical assistance and deployment support. And that includes working with our state and local government partners to really get investment out of the federal government into communities who can actually distribute those funds. But then bringing in our partners in the philanthropic organizations who are very good at building community capacity, building enterprise capacity, to supplement their activities with folks on the ground.

And we hope that all of this will unlock private sector investment for the real long-term transformative investment in communities. So how do we de-risk capital? How do we support brand-new enterprises? And how do we get our long-term private sector utilities and other companies to invest in disadvantaged communities? Next slide, please.

And so our approach to scaling energy justice, we hope that it will support this idea of energy, justice and

democracy. It acknowledges that there are complex, decision-making processes when it comes to energy. It fosters a sense of social connectedness to transform the way people consume and use energy. And then it'll create kind of long-standing institutional capabilities.

You know, as political appointees we know we're in the government for a short period of time and so we want to institutionalize energy justice throughout the Department of Energy, but also throughout the government. Next slide, please.

So lastly, I just wanted to share with you all that we have tried to increase accountability and transparency. We have a BETA version of an Energy Justice Dashboard that we would love for you all to check out. It begins to show where investments from the Department of Energy are distributed across the country. And we'll be updating this as we do more metrics evaluation, but again a way for people to see both where investment is going, and for us to identify gaps of communities that aren't getting investments. Next slide, please.

So thank you all for your time. Please feel free to reach out to me, that's my contact information. And I'll be open to take a few questions now, thank you.

COMMISSIONER MCALLISTER: Thank you so much, Tony. That was great. We really appreciate your

leadership on this. And there's so many synergies, a lot of mirroring going on between what we're trying to do in California, much of what we heard yesterday on the consumer and financing side. And so just really great, I was getting goosebumps there for a second.

And the dashboard is great. I'm going to turn our Public Advisor on to that and our media team. And I think there's also some ways we can echo, amplify what you're doing. And maybe the other way as well, because we're doing some analogous things.

I guess I wanted to ask one question and then I'll ask my colleagues on the dais. You know the points, the sort of facets of all the things you're working on in justice and energy justice absolutely ring true. And just there's just immense, immense need. I guess I'm wondering how you think about this in the context, even the broader context of the history of redlining and sort of the difficulty of engaging with the mortgage industry? And kind of have those bigger levers may be at the federal government that are where the real capital sits, maybe could be used to assist and provide some tailwinds to this effort that's more focused on climate and energy.

MR. REAMES: Yeah, that's a really great point. You know, so there are things within our control and the Department of Energy. But quickly, Shalanda Baker, the

Deputy Director of Energy Justice and the Secretary's Advisor on Equity, realized that we can't do it alone and be elite, right? And so she sits on an interagency advisory council that has people from HUD, HHS, and FEMA and all the other agencies.

And we're starting to break down those silos to talk about how do we collaborate? How do we bring funds together? How do we look at other policies and other agencies to look for some of those pain points that can cause the production and persistence of some of these energy inequities? And so thinking about the relationship between LIHEAP and HHS and weatherization and DOE, funding from FEMA when it comes to disaster recovery.

And so it's really amazing that those conversations are happening. And then the next thing is how do we work with Congress to make sure we change statutes that allow for these programs to work together better?

COMMISSIONER MCALLISTER: Well, it’s great to know you're thinking about those things, and if we can help in any way. They're obviously difficult problems, but I think one persistent theme in conclusion that we're hearing is that we're just not going to get to our carbon goals if we don't make a lot of progress on these structural inequities that really go well beyond energy and climate.

So again I think lots of ways, lots of reasons to build relationships across agencies at all levels to collaborate on these issues.

I wanted to see if any of my colleagues on the dais --okay, Commissioner Shiroma and then Commissioner Gunda.

COMMISSIONER SHIROMA: Thank you. Thank you so much. That is really so gratifying to see the Administration putting this effort together.

Will one of the first steps be to look at what kind of best practices are already occurring at our agencies? And I'm thinking about the Department of Agriculture where I had a chance to visit a farmworker housing, multifamily farmworker housing in Oxnard. And their energy efficiency investments were funded by the Federal Agricultural Department, which I hadn't realized it was so heavily involved. But it has been for many, many years. Because to change the hearts and minds of the federal diaspora is a tall order, but to see where it's been working already I would think would help change those hearts and minds.

MR. REAMES: Yeah, that is a really great point. Now we have a small group in our team that is looking across different programs to identify some of those best practices. And so what's happening in HUD with public

housing right? How can we ensure that housing is both affordable, but it also is as efficient, and people in multifamily housing have access to clean energy. And so there are programs there.

As you all know a lot of things start out as pilots and sometimes they fall off the radar and never get scaled up. And so we're really trying to say well we've done this, maybe during ARRA, and so how do we scale that up now so we aren't starting from scratch? So a really good point and I think we'll probably be releasing a report hopefully soon, that kind of lays out some of the things that we've found across federal departments.

COMMISSIONER GUNDA: Thank you, Commissioner McAllister. I'll just add, and I think it's kind of a high-level question, Dr. Reames. I just was going to thank you for first of all your service and then doing this now. This is great. I mean, I think I agree Commission McAllister that it's just incredible to see your personal journey as well as the work that you're trying to do.

So I had kind of a high-level question. You teed up your presentation beginning with the energy insecurity as kind of a definition. And more and more as I begin to dive into this, we hear the lack of metrics that really helps support what it really means. So you mentioned your desire to kind of take an approach in defining benefits

more clearly. I just wanted to get your thoughts on it, even evolving thoughts would be really helpful.

I mean, one of the things I was really kind of surprised by is the level of energy that's being used by low income is much, much lower right? I mean, they kind of decrease their air conditioning to a higher level typically, if you look at the entire nation, because of the energy costs. But then it really can't even compare, because of the redlining and the lack of trees in those areas, so there's a double whammy there. And the help of elderly, especially disadvantaged communities and low income, so if you can talk about if there is efforts on metrics or how we should tackle this?

MR. REAMES: Yeah, thank you for that question. And I think you hit on one of the key issues, right? Just the confluence of all of these challenges and trying to just think about energy consumption right. And we know that a lot of times low-income households, communities of color, are consuming less energy, because they're cutting back or curtailing. And that's why you see some of the challenges like unhealthy temperatures, because people are keeping their homes too hot or too cold. And so we have some folks from the National Labs on loan to our office that are helping us work through those models and thinking about the data we have.

And then hopefully we can work with partners like you all with some of the data we don't have. So we can work with PUCs and Energy Commissions to get data from utilities, get data from different states, so we can increase our modeling capacity at the federal level.

And so we know modeling won't be easy. There's always data challenges, but really creating a wish list and hearing from folks like you on what you want us to help push. Like I said, we have a mandate to work with the Energy Information Administration. And so how can we help craft the residential energy consumption survey that goes out every year to include some of the questions to get at metrics that everybody is concerned about.

COMMISSIONER GUNDA: That's wonderful to hear. Thank you so much for being here.

MR. REAMES: Thank you.

COMMISSIONER MCALLISTER: Great (indiscernible)

EXECUTIVE DIRECTOR CHERNOW: Commissioner McAllister? Sorry, if I can real quick, just in the interest of time just a quick recognition to Tony and his colleagues at the Department of Energy. At CAEATFA as we look to expand, to get the Authority to expand our program statewide, bring in additional sources of funding into our programs, we've already been in discussions with the U.S. Department of Energy who have shown incredible

accommodation to us and reached out to us. And hopefully we get to that point, but just the collaboration between the state and federal government now is incredible. And we're looking forward to working with DOE moving forward on a lot of our programs.

So thank you, Tony, and thank you to his colleagues for their help moving forward.

MR. REAMES: Likewise, thank you all.

COMMISSIONER MCALLISTER: Thanks a lot. And one observation, this came up a little bit yesterday, but just the equity -- and this sort of goes to Commissioner Gunda's point as well -- equity has so many facets and we're making up for so much lost ground over decades and centuries.

And this idea, back in the day I did a bunch of work at LBL, Berkeley Lab, and I did a bunch of work for the Department of Housing and Urban Development. And a lot of these same issues -- this was back in the early 90s -- a lot of these same issues are still with us. And this idea that as part of an upgrade of a low-income household there's a lot of deferred maintenance, a lot of sort of ancillary costs to doing that. And also there's the possibility of providing them with air conditioning that they didn't have before.

And so that sort of take-back effect, that they call it in the academic literature, that actually could be

considered an equity fix. And so even though it can lead to more energy consumption I think we have to believe, we have to understand this broader context that people are actually living in. And not see that as a bad thing, actually see it as good thing, as addressing some equity concerns.

And so I think as we're living climate change in California just daily, heat waves and fires. And we had an earthquake during the workshop the other day, we can't forget about earthquakes. It's not content-related, but still we have these long-term planning challenges in California. We can't forget that. We can't leave behind the equity imperative and forget to focus on that as well, so anyway just another thing to take into account. And I know you are doing that, so really appreciate it.

I mean your level of commitment just comes through loud and clear as you talk about these issues. And I just want to transmit to you and, through you, to the rest of the administration team that we so appreciate what you're doing. And the expertise and background and commitment and passion that you all bring to these roles as appointees, I mean, it's really tremendous that you stepped up to the plate and are doing that. So thank you so, so much for being with us today. And we want to collaborate in any way possible going forward, so thanks again for

being here with us.

MR. REAMES: Yeah, thank you so much for the invitation and it was really great joining you all. And like I said please reach out and we will be doing the same.

COMMISSIONER MCALLISTER: Absolutely. Feel free to stay on as long as you like. I know you're probably busy.

All right, thank you again, Tony.

MR. REAMES: Thank you everybody.

COMMISSIONER MCALLISTER: Appreciate it, take care.

All right, so back to you, Heather, to kick off our next Panel on Workforce Needs and Opportunities.

MS. RAITT: Yeah, super. So Gabriel Taylor is a Senior Engineer in the Energy Commission's Efficiency Division and he will be moderating the panel. So go ahead, Gabriel.

MR. TAYLOR: Good morning. Thank you, Heather.

And thank you very much Commissioners for your engagement in this workshop. And thank you especially to Tony Reames for joining us and representing the federal government perspective. Obviously, the coordination between California and the federal government is critical to achieving our decarbonization goals.

So now we turn to a four-person panel to discuss

workforce needs and opportunities associated with California's ambitious decarbonization goals.

We have four speakers today and I'll introduce them one at a time. So first up is Dr. David Roland-Holst, Professor in the Department of Agriculture and Resource Economics at UC Berkeley. Dr. Roland-Holst.

MR. ROLAND-HOLST: Thank you, Gabriel. I'm not sure if it's intentional, but my camera doesn't seem to be working. I'm told by a little box here that it's because it's been stopped by the host. Do you want to see me or you don't want to see me? I'm fine with that.

MR. TAYLOR: Well, we'll have a host turn on your camera in just a minute.

MR. ROLAND-HOLST: I'm agnostic about that.

MR. TAYLOR: Okay. We can hear you loud and clear, please take it away.

MR. ROLAND-HOLST: That's great. Let me try the video now.

MR. TAYLOR: Now the video is working.

MR. ROLAND-HOLST: All right, good morning, everyone. And thank you to the Commission and the Commissioners, in particular, for this new initiative and really to achieve more robust, inclusive and transparent policy dialogue and stakeholder engagement. It bodes very well for a new generation of energy policy.

Time is very short so I'm going to confine myself and my comments to the big picture, shall we say. Fortunately, our panel includes leading experts who can elaborate on the complexities of building technology and workforce development, but I'm going to highlight three salient issues for this specific category of building decarb, but also for energy policy generally.

I'm going to talk about redefining the energy paradigm in a kind of a conceptual way.

Then I want to talk about technology innovation, adoption and policies, some challenges and opportunities based on my own experience since the advent of the Global Warming Solutions Act. I have been very close to a state policy in California and marvel at California's leadership in that area.

And then finally I'm going to talk about energy savings and job creation. It's a very interesting and important relationship there.

Because I'm an economist I'm going to look at this in terms of supply and demand so please excuse me for that, but I hope that it gives you one perspective. May I have the next slide, please?

Okay, on the supply side of this energy paradigm as I refer to it, basically we all know that renewable energy delivers immense promise for GHG emission

mitigation. And that that's the primary reason it's part of the state's climate policy. But it's also important to recognize that it represents a new paradigm for energy supply generally.

Conventional or fossil-fuel energy is an exhaustible resource which is subject to ever-increasing costs; whereas renewable energy is a boundless resource, from our perspective at least, and it's subject only to a technology constraint. Of course, that's something we're pretty good at so it really gives us a different way of looking at energy supply and innovation, which is something I really want to emphasize today. Next slide, please.

Here are some of the early returns on this, and very recent returns. This is auction data on renewable energy prices. And as you can see, you're all aware that costs have been plummeting in most renewable categories. Most recently batteries, but solar and wind have been falling very consistently and significantly over the last decade. Now they're crashing through the band there, that beige band of carbon prices, and this is without even taking account of the handicaps with no recognition of the social costs of carbon or subsidies.

So what we see here is very clear evidence that innovation is changing the nature of the energy system on the supply side. Next slide, please.

The significance of that can best be seen on the demand side. And on that side, although I'm a reverent student, a disciple of the patron saint of energy efficiency, Art Rosenfeld, I have to say as a physicist, he was focused on the physical side of efficiency and the old prudential idea of getting more from less. But I think as an economist I really want to emphasize that energy itself is not the social problem. And what really is the challenge for us is the environmental and economic cost of energy.

We're addressing that by decarbonizing on the environmental side. But we also have technologies that we can promote, which will save energy in a more general way. And that is they'll save money on energy services. So I'd like to think about efficiency and I do think about efficiency in terms of the economic cost of energy services, not simply the amount of energy that's consumed.

I guess, for an analogy, your grandparents used to tell you that saving us a virtuous thing and of course it is. But investment is also very important to our future. And there are new ways to save through Social Security and things like that, so we need a broader vision of how to secure our access to energy.

And renewable technologies are demonstrating a new pathway for essentially defining efficiency in terms of

lower costs for the same amount of energy services or even more energy services for the same cost. Next slide, please.

Why is that important? It's important for a very simple reason. We have to concede this. The data makes it very clear that energy is one of the bedrock, the sources for prosperity.

This is a diagram one of my grad students calls the devil's bubble bath. On the X-axis we have Per Capita Income. So rich countries are on the right and lower-income countries are on the left. The vertical axis is Per Capita Energy Consumption.

And as you can imagine the U.S. is the world's undisputed leader in that category. It's a dubious distinction. But then all of the wealthy countries are in the upper quadrant of that diagram for a very simple reason, that energy underwrites our prosperity. It's given us, since the Industrial Revolution when we originally domesticated carbon fuels for more general use, it's conferred living standards that were beyond the imagining of our ancestors. And we all understand that, I think.

So it's really important to accept the fact that energy is necessary and allow, particularly, our developing partner countries, especially those two very large bubbles -- the bubbles are proportionate to the population size, by

the way -- to achieve living standards that more closely resemble our own. I mean, it's clear that climate equity and energy equity are a global issue. And we're really going to have to find ways to make energy accessible on a much more equal basis within the state, within the nation, and globally. Next slide, please.

Okay, in terms of technology policy and energy, what can we do? I mean, California again has a really laudible history for promoting this. And it's one reason why we are the home of so many innovative industries. But the enabling policy environment, I think, can recognize the essential mission which is to correct market distortions. And that basically means gaps between private and social costs and benefits. I'm sure you all understand that.

And then evidence-based policy, and here the CEC I think should be very proud of its leadership through the PIER program and other funding and research.

Today's economy is so complex that relying on rules of thumb and intuition alone will never achieve anything approaching optimality, so funding, more intensive research, discovery and better public information for decision-making is a really important companion to this. So evidence-based policy and policy that enables innovation, I think, are the primary objectives.

And how do incentives work? Well again

California's got some great examples. We've relied on standards many times. Art Rosenfeld has made energy efficiency famous with his examples from electric appliances. But here's the underlying dynamic that makes it so successful in California. Every time California establishes a technology standard, it creates an incubator the size of the world's fifth largest economy. The venture community understands this. So when we did pass AB 32 and we created a Cap and Trade system and put a price on carbon, it triggered hundreds of millions of dollars or billions of dollars' worth of private, complementary investments.

And clean energy is, I mean, the venture community understands this. It's one reason they're so excited about climate policy in California and elsewhere, because clean energy is the next breakout knowledge-intensive sector following IT and biotech. And by incubating that in this state they know they can create competitive advantages for a global market that is already explosive.

Subsidies and fees, they're okay, they're fine. But at the same time we have to be very careful with those that we create. We don't pick winners and losers too specifically, but simply correct for existing distortions. Next slide, please.

Okay in terms of demand, on the demand side of implications for policy this is a little bit more complicated. And I've heard some really constructive discussion today and again, California is leading the way in this. But technology adoption, right? This is about human behavior which is fiendishly difficult. I've got to tell you that my profession, the landscape of my profession in economics is littered with the bones of people who tried to predict the adoption behavior, it's extremely difficult. And the private sector should really bear those risks. There will be the Apples, there will be the failures, there will be the Teslas. There'll be everything in between. But those risks I don't really feel they are appropriate to assume as a public responsibility.

However, there are some very important and grave responsibilities for the public interest and that mainly has to do, I think, with equity. Large commercial property owners can certainly lead with innovative investments in building decarb, and they should do. But they will be less labor-intensive in their approaches.

Whereas, small enterprises and households, because they face higher costs of capital and other financial constraints, will find adoption more challenging. And this is where a whole suite of complementary policies are already being considered, I know, and I really hope

that they'll be advanced.

But remember too that it's not just for the sake of equity among the among the adopters, it also creates a different kind of opportunity in the labor markets for local employment, for more labor-intensive employment, in installation, operation and maintenance. All of those solutions are going to be more diversified and geographically, and I think also institutionally across smaller and smaller enterprise. In the residential space this again gets very complicated because of the behavior.

It's essential that we recognize affordability constraints, absolutely essential. Otherwise, as several of our speakers this morning have already observed we're not going to get to our goals. Our goals are very ambitious and we need to mitigate emissions by everybody, but we can't do that without an inclusive approach.

Look at the situation with electric vehicles. I mean I've worked a lot on electric vehicles. I'm still very optimistic about electrification of the vehicle fleet. But we know that results in the last decade have been disappointing. I think that's going to change. I think we're at a real inflection point right now. But still low-income households can't afford these innovative vehicle technologies in the present circumstances. And they have to face the same constraints with large appliances, but

even more difficult with things like infrastructure investments on the residential side. We have to recognize the distinction between tenants and landlords, because landlords often make those adoption decisions for the occupants. And the incentive programs have to recognize that heterogeneity. Next slide, please.

Here's an example of heterogeneity. This is some work that I did for the Commission and we've developed economic modeling that goes down to the DAC level, so we have very high granularity in our impact assessment.

The upper one looks at public health costs. I'm sure that you're aware that air quality is still a very significant challenge in the golden state. And it's also a very important equity challenge. But on a large scale, I mean I'm not sure how many people realize that air quality kills more people globally every year than COVID has done this year. Last year 4.2 million people died from respiratory related-illnesses from poor air quality globally. COVID is catching up, but it's not there yet. It just traveled over the 4 million mark. But this is every year that we still face this mortality. In California, although its standards are much higher on average, it still has some very important challenges locally.

To identify these things we really need to think

about complementary policies that can support the sort of larger scale mitigation objectives.

And as I was saying we've also found that our job creation, this is research we did on the long-term energy strategy for CEC about three years ago. And what we discovered is that the buildout itself actually creates a disproportionately large number of jobs in disadvantaged communities, because those are semi-skilled construction related jobs. So this can be a more inclusive process, decarbonization, as long as we're very deliberate about how we target policies. Next slide, please.

Okay now I'm going to get to a more macro issue, which doesn't I think get enough attention. But it's really important to recognize not just the direct benefits which our other panelists will certainly talk about in terms of direct employment from investment in decarbonization, but also the indirect benefits. And this comes from this idea of efficiency that I've been kind of been pushing from the beginning of my comments.

Promoting energy efficiency saves money for households and enterprises. What's so important about that, apart from the selfish desire to save money? It's very important, because consumers spend their savings in significant proportion. Those savings, if the households can spend less on energy they're going to spend money on

other stuff that they really want. They're going to employ workers, it's of all skill levels and demographics. Because 70 percent of household consumption in -- here's the 77 -- 70 rule for California -- 70 percent of GSP, total state demand is consumption; households, they drive the economy.

Secondly, 70 percent of household consumption goes to services. We're a postindustrial society. And that means that if you can pull a dollar out of the gas tank, because you have an efficient vehicle or a hundred dollars out of your electricity bill, because you have more efficient appliances or lower costs of electricity, then you're going to turn around and spend 70 percent of that on services. This is a very potent catalyst for growth. And I'll show you how that works in the final slide. Next slide, please.

All right, this is a list of 120 sectors in the California economy ordered by job intensity, labor intensity. That's the vertical axis. And the jobs on the lower right-hand side are very low job content in terms of jobs per million dollars of revenue. The fossil-fuel sector is concentrated in that lower category.

Notice that it's a logarithmic scale, because of disparities of job creation , intensities are so great across sectors. The high-job intensity sectors are

services. So if you can get consumers to move their dollars from energy to where they want it to go, into services, this will have a potent multiplier effect for job creation.

But that will be across the entire economy. It's not just jobs for energy, whether new energy or old energy, these are jobs at all the local service industries in your community. That's where people want to spend their money. And the average household expenditure on other things is 16 times more job intensive than conventional energy.

And the most important thing, I think in a way is after that is that these are in-state jobs and services. They can't be outsourced. They cannot be outsourced like oil supply or like manufactured goods. So this is a very potent opportunity to our complementary growth through this idea of efficiency. And I know that building decarbonization is going to promote efficiency. Thank you very much.

COMMISSIONER GUNDA: Gabe, you're muted.

MR. TAYLOR: Thank you very much Professor, I really appreciate that final slide. That's definitely something we are going have to look at closely for our final report.

Next up I'd like to introduce Philip Jordan, Vice President at BW Research Partnership. Philip?

MR. JORDAN: Thank you, Gabriel. I'd like to thank the Commissioners as well, for your leadership on these issues. And I also appreciate your engagement and support at the national level as mentioned, the federal government, thinking about much of this work.

And I'm going to talk a little bit today about some of those job impacts, so I think may be a good segue from the from the prior presentation. And really, really excited and happy that you had Dr. Reames on and that you also have Sarah White speaking later, because I think these issues are all intertwined. And so it's nice to see that there are some real experts in the field.

As I think about sort of the challenge and the opportunity in front of us with the potential creation of substantial numbers of jobs and economic activity from decarbonization, I think there are some complementary and often competing aspects to how we'd like to see that transition occur.

So of course we all love growth, right: job growth, economic growth, earning growth, GDP growth. We've heard a lot about savings and energy savings, the importance of energy savings, particularly around energy-burdened households. But as shown on the prior presentation there those savings can really translate to significant ripple effects throughout the economy of

increased economic impact.

Obviously the environmental protection that we're looking for the in climate and impact on climate. Equity, which I think really we're focusing on racial, ethnic, and gender diversity and equity as a primary component of that.

And then the creation of high-road jobs, right, that are a sustaining wage career jobs. And those often can be accomplished in a single policy, but in my experience it requires -- they do not always work hand in hand, so it's really important I think that we think about all those elements.

So I just wanted to lay that out upfront sort of as a framing here. And I'll just take a few minutes to give some of my observations from some of the work that we've done. As I said nationally, we've produced the California Energy Employment Report in 2020 for this Commission as well as the U.S. Energy and Employment Report with NASEO. And the Energy Efficiency Initiative (phonetic) is of course, now back with the Department of Energy.

And I thought I'd provide some observations in terms of what we need to think about in terms of this growth about equity and about workforce. So looking really at just sort of the direct and indirect jobs, so thinking about the jobs that are that are not all those what

economists call "induced effects," of the additional spending from savings or earnings for these careers. But just really on the direct sort of activities around decarbonization and the supply chain, manufacturing and services that go into that, we are talking about creating hundreds of thousands of jobs in the United States from this transition. And millions and millions of jobs-years, as we call them, meaning that these are hundreds of thousands of jobs that will last for a very long time as we transition the economy to a decarbonized one.

And this really shows -- this chart here, is really to show the types of jobs that get created with sort of these, many of the policies that have been sort of thought about in California and across the United States. And we see lots of jobs around project development, manufacturing, construction, really a lot of these sort of deployment- related jobs. So keep those things in mind as we think about manufacturing, engineering, construction, as we go to the next slide, which shows California's industry employment and the change really from pre-pandemic to sort of the most recent data that we have.

And you can see these job losses in the far right column of where the jobs have really been lost and sort of where they have not come back. So leisure and hospitality are still down 25 percent. Many of the other services and

business services down 19 percent, whereas things like manufacturing and construction are 94 to 96 percent back from pre-pandemic levels. This means really that we have a mismatch, right? The types of jobs that we're looking at creating are largely going to be found in fields that are nearly back to their pre-pandemic employment. So obviously everyone's going to be excited about creating more construction jobs, more manufacturing jobs, more engineering jobs.

But we have a new challenge facing us from workforce development, which is really that -- and we've heard this from employers throughout the country and in California. It's very, very hard for an employer in the construction industry who is desperate to get people on a job site to know what to do with a person whose last job was working in a restaurant or working in a hotel or working in retail. So there is a mismatch there that's very different from the great recession, where we had really this housing bust following the financial collapse. So we had lots of skilled laborers and construction workers who were unemployed or underemployed. And the types of infrastructure investments at federal level and the state level really helped to bring those jobs back in significant ways.

Here we have a little bit of a different

challenge, which is we still need to create lots of jobs, absolutely no question. There's still have lots of jobs to create. But we need to really be thinking about how do we create programs and training and earn-and-learn to make sure that as we think about high-road strategies and other sort of considerations, how do we make sure that we're getting folks who may have very unrelated backgrounds into these fields. And by the way, they'll make a lot more money doing those.

A couple of other considerations -- let's flip to the next slide -- this is a figure that is replicated all across the country and it keeps me up at night. And some of this is certainly structural in the industries and occupations that have been most impacted. But also structural in that whenever we have a recession we seem to see disproportionate negative impacts in communities of color and also women. I don't have that in this, but you can draw the same conclusion.

So what we see is just really very high rates, much higher rates of unemployment in black and Hispanic workers overall, and then certainly much more as a result of the pandemic around the end of 2020. So you can see some of these percentages and the increases.

But when we think about equity it's everything that we've talked about. And I don't mean to suggest that

there's a "but" in here, it's definitely an "and", but I would say it is absolutely the cost of energy and it's absolutely siting decisions that create pollution in communities. But it's also about the economic impact and making sure that the benefits and the opportunities that are associated with these jobs are available to people who have historically not had equal access to the opportunity. Next slide.

Now we're going to talk a little bit about the challenge here on those two fronts and the opportunity, right? So clearly what we see here is lots of job creation opportunity flowing through the entire California economy, huge numbers of jobs potentially to be created from this decarbonization. And that is net jobs, which I think Professor Roland-Holst sort of indicated with his demonstration there on his slide of the energy intensity, or the intensity of -- employment intensity of different sectors. So lots of new net job right, lots of new jobs. That will largely have to be filled by people who don't have much experience today in related fields.

And to make our commitment to equity and inclusion real, we need to make sure that we are also ensuring that the opportunities are available. That the training is available, that the pathways are available to a substantially greater number of people of color and women

that are currently participating in the clean energy or energy industries or construction industries or manufacturing industries for that matter. So how do we need to think about doing that and what are the skilled sort of requirements that are going to be necessary here?

So now again complexity, there's all different types of complexity over a period of time. But we looked into some of the different certification programs around things like installing air source heat pumps which is a major sort of drive, the two-way heat pumps that DOE is talking about, that many states are talking about.

And what we found is that for someone who is a professional HVAC technician, it's a pretty low lift, it's a pretty small lift. So most of the trainings are three days or less of in-class training and then usually some practice. And actually most of the programs are two-day certification programs. But those are sort of as you advance in the field, so there are opportunities to do more. But we're talking about training measured in days right, not weeks or months.

And that's important, because what it highlights here is that the key is really the pipeline for HVAC technicians and how to make sure that all HVAC technicians trained in California are getting the various heat pump installation training and manufacturer certifications that

are required.

I worked in the California community college system for a few years and it's a terrific system. Many, many states are envious of that system. And it's a proven, not only in the academic and transfer arena, but also in its current technical education, and its commitment to serving a diverse population of students. So here's a great example of how we can increase the pipeline and accessible jobs by essentially ensuring that we have sort of equitable access to the training programs that exist already and incorporating many of these certifications that are fairly low-lift certifications. I sort of make the point again in the next slide.

So you can look at electric vehicle battery charger installations. This is also very similar for behind the meter storage installation. If you are a California state-certified general electrician it's a pretty short lift, right. So the charge point is actually measured in hours. I guess you could do that in days too. It's enough hours. You could measure that one in days. And the EVSE certification is a 10-day online training with a final exam. So for a certified electrician, it's a fairly light lift. I would also note that the electrician's portion of installing that heat pump is also something that does not require significant additional

training.

So again the takeaway here is not dissimilar from the conversation we had ten years ago in the same vein, which is that a lot of these jobs around building decarbonization have the same title as jobs that exist today. They have some advanced skills, perhaps that are short-term certifications that are often manufacturer certifications. And that the real challenges I see it is getting the access question right and making sure that we are sort of continuing that emphasis on equity and those high-road jobs.

So the question really is not oh good -- or the takeaway I guess should be from the last two slides is not, "Oh isn't it exciting? It only takes 40 hours. We only need a one-week training program." That's certainly true for certified electricians. But what we really need to be thinking about is if the starting point to somebody whose last job was in catering, then we really need to think about how that person can get on a pipeline that has earn-and-learn and apprenticeship and other apprenticeship-like elements into that field.

So hopefully these comments have been helpful in terms of framing around some of the needs that I see that exist around the decarbonization workforce. And I look forward to the discussion that will follow, thank you.

MR. TAYLOR: Thank you, Phil, really appreciate the comments.

Next up we have Neha Bazaj, the Senior Economic Inclusion Manager at the Emerald Cities Collaborative. Neha?

MS. BAZAJ Hi. Thanks for that intro. Let's see, do I have slides?

MR. TAYLOR: Here they are, yeah.

MS. BAZAJ: Yeah, as I mentioned thank you for having me today. We can go to the next slide.

So the focus of my time today is really talking about economic inclusion, specifically in residential building electrification. There's some nuances and differences between residential and commercial. And so we often talk about construction as one sector, but that's not really the case. So if we can move to the next slide.

So I'll share just a little bit about who Emerald Cities is and what we're focused on, why I'm focused, and why we at Emerald Cities are focused on residential buildings, some of the unique challenges of the residential construction sector. And then of course wrapping up with some recommendations that I have for moving forward. Next slide, please.

So Emerald Cities really takes the whole system's approach to the clean energy and green energy

transition. So our mission is to green our cities, build our communities, and strengthen our democracy. And so while today we are really talking about the workforce impacts of building electrification, at Emerald Cities, we're really focused on both sides of that. And so as some of our speakers today have already mentioned, making sure that building electrification is accessible to all, as well as ensuring that the work that follows from those new investments and that new infrastructure, that work flows to all as well.

And so up to that point also ensuring that any jobs that are created through these investments are high-wage, high-road careers. And so that requires a couple of different things, not only the workforce development infrastructure that Philip just spoke about, but also an attention to the detail about what are the contracting and procurement opportunities that are out there and how are those structured. Next slide, please. Next one, thank you.

And so without really going into it too much just some basic statistics on why we feel that the residential sector is particularly important. So here's some recent research that the UCLA Luskin Center did, and we see that the residential sector is responsible for 21 percent of all-natural gas use in the state of California.

And so what that means -- if I can go to the next slide -- again, from UCLA Luskin Center, of the many thousands of jobs that are expected to be created through building electrification, the building electrification process, residential construction jobs are going to be 39 to 47 percent of all of those jobs. And so if we are wanting to ensure that construction jobs are high-road, we really can't ignore the nuances and we really need to be sure that we're tailoring our policies and our approaches to the different sectors. Next slide, please.

So as I mentioned at the outset, Emerald Cities is really focused on whole systems approaches. And so just as I've laid out the rationale for why we're focused on the workforce in the residential electrification sector, I don't think it can't be said enough how important it is to ensure that there is equity and focus on the residential sector and actually who receives electrification.

And so as we're all well aware low-income and communities of color are the worst hit by the climate crisis and also bear very high utility bills or utility burdens. And so as we're designing our electrification policies on both sides, we need to be sure to not be exacerbating the inequities that already exist. Next slide, please.

So it might be -- apologies if it's a little hard

to read -- but we've been doing some work with RMI and they are working on putting together building inventories for cities across California. And just to note that this is very much in draft form.

But here we see that some of the nuances within the residential building sector. So as I believe one of our opening speakers noted that there really needs to be attention to the differences between folks who own their homes versus folks who are renting their homes, and nuances between single-family and multifamily buildings, attention to the income level of different homeowners and tenants, and their abilities to adopt these new types of technology.

And leading into the next section of my presentation, yes, while there needs to be lots of attention to the affordability of these new technologies that can't be at the expense of making sure that the workers who are doing that work, that can't be at their expense. Next slide, please.

So there's a lot of research and literature on the differences between the residential and commercial building sectors. So again, we have some research from the UCLA Luskin Center demonstrating that the residential construction sector tends to be more low road than the commercial sector. And this is, of course, not -- I don't want this to come across as every single residential

contractor is low road, that's certainly not the case. We're talking about trends here. And so we even have some research from the CEC itself and some other academic literature saying that in the residential construction sector it's just a different model. You're going for the lowest bidder. And that can mean -- again, not that it necessarily means, but it can mean -- that some of those low bids come at the expense of workers' wages. Next slide, please.

So in thinking about moving forward with residential building electrification and thinking about the workforce that is needed for that, we need to ensure that the jobs that we're creating don't go low road. I think it's very clear that the building electrification movement or push is going to create jobs, but there needs to be attention to how those jobs get created. Next slide, please. Next one, please.

So it's been great to hear from the speakers today and also a bit of a recap of the past few days -- but unfortunately I wasn't able to attend -- that there is a lot of interest and focus on diversity and labor standards and contractor and worker training. And that's wonderful to hear. I think unless those sentiments are actually embedded into building electrification policies themselves as well as the funding for all of those things to happen,

it won't happen, right? It's nice to have goals, but unless we are being intentional about putting that into policy and funding it, the implementation of that isn't going to happen. Next slide, please.

So here's some high-level recommendations and sort of in three broad categories. First up, I think, as one of our speakers today already mentioned we need to have collaboration. We need to ensure that we're engaging communities, workers, as well as contractors early in our processes to ensure that their input and their collaboration are part of crafting these policies. They know best what they need, and we need to hear from them.

And then I know that today's panel has really been focused on workers, but again we have to remember that workers work for contractors. And so not only do we need to focus on making sure that folks have actual access to the training that they need to enter the construction field, but we also need to be sure that our small, minority, women, disadvantaged contractors have access to the contracting opportunities that come from building electrification.

And to that last point about contract opportunities, we need to engage in some creative thinking about how might we structure residential electrification incentives or dollars or projects so that we are not

reliant on that low-bidder model. Maybe we have to think about ways that we can aggregate projects and create contractor databases of contractors that we know are small, minority, and women-owned, or that we know are paying particular wages, that have a corporate training. Maybe we even set wage standards for these projects.

And so this is just a few thoughts and a few ideas, certainly not exhaustive. But again this is going back to we need to be sure that we're doing that engagement with communities, workers and contractors to develop the correct solutions going forward.

And I think that is it for me. Thank you for your time and looking forward to the discussion.

MR. TAYLOR: Thank you very much, Neha, and thank you especially for joining this discussion. I think the perspective is critical.

All right, we're going to have to save questions for the end of the panel. I should have mentioned that at the beginning of our discussion.

The final presentation on this panel to anchor our discussion here is Cori Jackson, the Program Director of the California Lighting Technology Center at UC Davis. Cori?

MS. JACKSON: Great. Thanks, Gabe.

So I am sort of closing out this panel and I

asked to save my presentation until the end for a couple of reasons. Number one, being at UC Davis, I've been there for about 13 years now. We have been working in a number of projects and programs on very practical day-to-day workforce challenges. And how we solve what may seem like simple problems, but they have big impacts down the road in what's now being called high-road jobs.

And so I want to take this time to just sort of give a very practical and small example of how some of this decarbonization discussion and conversation could play out in just one small sector of the California economy. So next slide, please. There we go.

So in California, and this data comes from the California Energy Commission, in California our building stock is primarily existing buildings. And so looking at it on an annual basis we have about 96 percent in the commercial sector existing buildings, and roughly 4 percent new construction per year. And these are buildings that will be available for decarbonization measures.

Similarly, in the residential sector, only 2 percent of buildings are newly constructed homes and existing buildings account for 98 percent of the building stock.

And so when we think about decarbonization measures and the jobs that go along with that, we should be

focusing, I believe, primarily on existing buildings and measures and programs and solutions for existing buildings across both sectors, residential and commercial.

It really is across all building types in the commercial sector. The graph on the left, you can see that everything from schools to restaurants to hotels, existing buildings, really make up primarily the area that we are going to have to focus in this state if we want to address decarbonization. Next slide.

But there is a disconnect currently between the projects and revenue that contractors, specifically electrical contractors, are pursuing and receiving versus the projects that we just saw need to be done to address decarbonization. So if we know we need to look at existing buildings to decarbonize in contrast, our electrical contractors are focused. And this data comes from a sample of about 1600 contractors. We know that they're focused, at least primarily on new construction. So about 50 percent of projects in revenue are going to that 4 percent, that 2 to 4 percent of newly constructed buildings.

And we have modernization and retrofits going on, 25 to 30 percent. So there are some projects going on addressing existing buildings, but unfortunately about 25 to 40 percent -- and these numbers are based on contractor size -- 25 to 40 percent of the projects in revenue are

going to maintenance and repair. And these are projects that do nothing to essentially decarbonize our building stock. And this is just work that's maintaining the status quo.

So we have this disconnect between where our contractors, primarily our electrical contractors, are working now versus where they need to be working if we're going to meet our decarbonization goals here in California.

And so the big question comes is how do we incentivize? How do we increase interest in and activity in the existing building sector through policy and programs, so that we can reach those goals? Next slide.

So there's several specific revenue and employment opportunities and several of the speakers have touched on elements of this, but in the electrical contracting field there's some very specific things, namely after electrification in terms of equipment and using renewable generation, where do we go for existing buildings? And the one of the key areas where we need to go is into controls and automation and grid connectivity. And creating the jobs and the interest in putting those buildings into the connected grid. And that's going to be done through controls, through automation, and communication technology.

There's going to be the need for metrics, which I

heard touched on, defining metrics on how we measure building energy use and carbon intensity of our existing buildings. And so there's opportunities and needs in performance metering.

And then as we're collecting all of this data what do we do with that data? And how do we really use it to truly bring our buildings back towards an optimal grid-connected position in California? But unfortunately, when you look at the revenue again -- and I apologize if that's a little hard to see -- but less than 10 percent of revenue right now for our contractors are going towards things like building systems integration, which will be key for decarbonization.

Less than 10 percent of revenues for building automation and control systems, communication, and energy management, all of these things that we can talk about at a high level. And those of us participating today know how important they are. When it comes to people and contractors doing this work today, very few are addressing the technology that needs to be installed to get our building stock, existing buildings in line with a decarbonized future. Next slide.

This is a specific graph that really highlights some of the gaps and where, I believe, the state as a whole needs to be focusing their attention if they truly want to

create high-road jobs and creating that that workforce of tomorrow. And these are firms -- this is self-reported data, again from about 1600 to 1800 contractors -- but they are reporting active engagement in systems integration, data or telecom center projects.

And you can see on the left that about 50 percent of our workforce is reporting that they are involved in some form of these trades, some form of this technology, which means there is over 50 percent as of 2020 that are not engaged at all in any way in these services and construction trades and technologies unfortunately.

And that's the gap that we need to address if we're talking workforce development, is how do we engage these folks into looking at systems integration and communication for our existing building stock? Next slide.

So some of the challenges that we see and that we are working through at UC Davis, at UC Davis the California Lighting Technology Center where I'm at, as well as the Energy and Efficiency Center, we've been involved in workforce education since probably about 2005, 2007, somewhere around there.

So before that big recession hit the state we had just started diving into how do we teach skills and transfer knowledge that traditionally falls to students at a four-year university? How do we move that into the

workforce? And how do we take information and knowledge and education that traditionally is taking four to sometimes six or eight years to obtain through a university system? How do we select and transfer that knowledge to our workforce in a more useful way? In a way that they can benefit from those skills and knowledge, but that doesn't leave them eight years into an education that they may not need for day-to-day jobs.

And so some of the challenges we've identified over that time I think are potentially very, very poignant and very, very focused and appropriate for building decarbonization, which was not part of the conversation over the last ten years of our work until recently at UC Davis.

So right now we have found this is coming to light. And it's been true of our work through the past decade, is that we have new technology and new technology is available. But it's coupled with an aging workforce that is now choosing retirement over retraining. And so we're losing this wealth of knowledge on electrical infrastructure and the skills and knowledge to do traditional jobs in the electrical industry. We're losing that and we're losing the workers that will be there who will retrain and learn the new skills that are needed to decarbonize existing buildings, which are going to be

namely controls.

I heard someone say that our building stock has become digitized. Unfortunately, I feel that our workforce has not. And so when we don't have workers and companies that are at the same level of technology, that that's a huge gap that has to be addressed as in point number two, so we're transitioning to this digital infrastructure.

And traditionally we have electrical contractors and workers that are not part of the day-to-day work that's going on with control systems, start-up and commissioning and the programming and really the computer skills that go along with that. And so there's now a blurring of the line within the electrical industry between traditional wired installation and the skills and knowledge that go with that, and the new skills that come with a digital world and a grid-connected buildings and all of the communication that needs to go along with that.

Again integrated systems, we touched on it. We saw 50 percent of firms that we're working with don't touch on integrated systems, really in any way. But these systems, we need cross-disciplinary knowledge or we need skills and collaboration between different trades, which historically has not always been the best. So we have very siloed trades across the state that are working in HVAC, but not in electrical or in plumbing but not security. And

now we're seeing these integrated systems and we want integrated systems with the energy savings that come along with that, but we have a workforce that needs to really change the paradigm on how they work, to be able to work with those kinds of systems and the collaboration that's necessary.

And, as I mentioned, the lack of computer programming and cybersecurity in particular, curriculum and training within the trades is low. And how do we address that? That is something in particular that UC Davis has been working on with the Department of Labor. There's been a federal investment in California to teach cybersecurity curriculum to electrical contractors, because there's methods with wiring and switching and programming and skills that these contractors need to address building cybersecurity. When everything's connected they become a source of cyber threats.

So we also have existing issues with low rates of compliance and enforcement of our existing standards. So we have a lot of energy standards for existing buildings that just aren't being enforced. And so very practical solutions regarding enforcement of what we have already to date could take huge strides, make huge strides in reaching our decarbonization goals.

So the solution often isn't new standards or new

requirements, new regulation, but looking at what we have and working with our communities to enforce the regulation we already have.

And then last, and this was touched on briefly at one point, is there is really a lack of financial incentives that impacts capital and first costs. And it can be community-specific, it can be specific to communities of color or to specific areas of the state. But there's a lack right now of how do we buy down these technologies in a way that really encourages building decarbonization in the existing building stock. Next slide.

And so briefly some of the solutions, and again it comes from the years of working in this arena, is we know that we need to incentivize and invest in education and training as an efficiency and decarbonization measure. Education has been historically looked at as a cost to a project. And there's no real value in terms of energy savings or cost savings that's assigned to education and training. And this is a fundamental flaw quite frankly in how we address education and training here in California at the state level. Without a value, recognizing the value, it's we really can't go much further until that paradigm changes.

And the second issue is in some areas we've

adapted training and certification requirements. But again, training and certification of contractors on down to workers can really ensure quality. And it creates those high-road jobs that ensure that sustainable -- number one, energy savings are sustainable, but our job market is sustainable, high-wage jobs are sustainable, and that comes through training and formal certification. They don't necessarily need to be achieved through any kind of university system.

Again, transferring the benefits of a university and a community college system to the trades, that's important. And quite frankly transferring the knowledge, skills and hands-on learning that the trades excel at, taking that information from the trades and how do we better our college graduates so that they're ready to hit the ground running when they graduate.

And then overall, and this has been touched on throughout the speakers, we have California's Jobs and Climate Action Plan for 2030. And I think the best thing we can do as a society and as agencies of the state of California is to embrace and support that plan. It's not perfect, but it's very good. And it addresses many of the things that we all talked about wanting to see. And so no need to create the wheel in many cases, we can really use that plan as a roadmap for where we want to go.

So thank you, looking forward to the discussion. And I will turn it back over to the Commission. Thank you very much for the time.

MR. TAYLOR: Thank you so much, Cori.

And I invite all four panelists to turn their cameras back on and we'll invite the Commissioners to ask questions.

COMMISSIONER GUNDA: Thank you, Gabe. I just wanted to see if you put in any time for the Q&A question that we got, so do we want to do that at the end?

MR. TAYLOR: Usually we have discussion with the Commissioners first, and then we'll do the Q&A.

COMMISSIONER GUNDA: Okay, great. Thank you. So first of all let me just give a thank you to all the panelists for those thoughtful remarks and kind of helping frame this workforce conversation.

I think I will start off from actually a very high-level question on the cybersecurity specifically, and then the jobs, and then the digitization of the overall workforce as a starting point. And I will hand it over to Commissioner Shiroma and Commissioner Monahan and Executive Director Chernow in that order.

So if we want to talk about this intersection of jobs, specifically in the interconnectedness of digital as well as the electrical systems now and how do we really

improve the cybersecurity and the overarching planning? I mean I think most of the work as Commissioner McAllister laid out in the morning requires a lot of digitization and having that comfort and security in that. So if any of you can kind of talk about the evolution of the workforce along those lines, and what do you see as solutions and options there.

MS. JACKSON: Yes. That's a good question, Siva. Cori, here at UC Davis. Cybersecurity has really become a very important issue for us at the university. We have within the UC system there is a wealth of knowledge on cybersecurity issues from a very traditional perspective of securing data centers, securing computer systems. But what we're working on is we're seeing that issue, which I'm sure is why it's generating the question, is that's becoming -- the building itself is becoming the point of entry into the network.

And so we are working on -- with a grant, and this is recent -- we're working on a grant with Department of Labor of transitioning a subset of those computer skills over to the trades. So that they can: 1) understand the importance of cybersecurity and therefore become advocates for it in their day-to-day work.

And 2) teach them some very basic wiring and switching techniques, quite frankly, that can help island

or isolate buildings, so that there's not cascading failures across a system if a cybercriminal were to access a building system. And this is becoming more common. Quite frankly, right now we are getting by because we are not a high-priority target and by "we" I mean the buildings. Buildings are not yet high-priority targets, so we're really getting by just because we're in the shadows right now as a building sector.

But it's starting to come to light. We saw this with the fuel infrastructure on the East Coast when hackers attacked, so there's a more and more risk being driven towards the physical infrastructure. And so we're teaching both the physical mechanisms for securing buildings that an electrician or a contractor can take to eliminate the cascading failures. But we're also teaching the theory and some of the programming skills, so that before that electrician walks out of the building, they can at least be sure that they have connected their network lighting system in a way that it's not easily accessible from the public through the network. Or they have connected their HVAC system that's part of a building energy management system. Teaching them the basic skills to be able to look at and verify and connect those systems at the very most basic level to ensure some level of security before they leave the building.

We're not teaching them to become commissioning agents or to become security professionals in any way, but simply be knowledgeable, become advocates, and provide the first level of security before they leave the building and turn it over to others to do that work. And so that's how we're handling it right now with the work that we're doing.

COMMISSIONER GUNDA: Thank you, Cori. I don't know if anybody else wants to comment. If not I will hand it over to Commissioner Shiroma.

Commissioner Shiroma, to you.

COMMISSIONER SHIROMA: Thank you, thank you. It's very insightful. Thank you to all of the presenters. And it is what we are grappling with both at the Energy Commission and the CPUC.

I was listening and looking at our decision that we voted out on the Energy Savings Assistance, the ESA program that it's $2.2 billion we've authorized for the next few years. And we are requiring the utilities to track the contractors, where they're hiring. And then also the education tours, a career-ladder type of effort now. But clearly there's much more we need to do, so I'm not sure if anyone has any viewpoints about the education, the certificates.

The community college sector, I am a community college alumni, San Joaquin Delta Community College in

Stockton. I'm proud of that, by the way. And to hone in on something like that, are there some specific action items, perhaps even beyond what we have jurisdiction over, but specific action items that we need to spur, to spark? There are also the apprenticeship programs of the unions. And I'm sure we'll hear more about that in our next panel.

These are aspirational goals, but how do we put those practical building blocks in place for job training, higher wages, for creating an interest in these jobs? That's a big question, but any other thoughts? Thank you.

MR. JORDAN: Well, Commissioner Shiroma, this is Phil Jordan. And I worked at the Cuyamaca College in East San Diego County a number of years ago in one of the centers of excellence and we looked at some of these issues. And I'm very familiar with the community college system in California and would agree that it's a terrific asset and conduit for helping to hit many of these objectives. Because some of the skill requirements that we're talking about that will be needed in the training and certification are really in vocational trades where community colleges already have very strong presence. And many of the colleges have demonstrated sort of a flexibility and ability to work with industry to help to create sort of additional training and augmented training modules.

Prior to the pandemic I traveled to the All-Energy Conference, the decarbonize conference in Scotland. And when I asked the folks in Scotland about how they were doing it and shared some examples of how we do it in the United States they looked at me and they were quite puzzled. And they said, "We don't understand why you do it that way. Because from our perspective these technologies like heat pumps or different battery technologies or charging stations, the companies that manufacture these products have an absolute need to ensure that there's a workforce that can install them." So if Fujitsu trains everybody on how to install Fujitsu and Mitsubishi doesn't, guess what's going to get installed and who's going to sell a lot more units?

They said, "Why are you talking about the public sector paying for training on specific technologies? What we do here is we have our HVAC program, which we pay for. And we put the money towards that and make sure increasing accessibility there and making it free and all that kind of stuff. And then we say okay and we make the weekends available at your cost, Fujitsu or Mitsubishi, or Trane or whoever it is. You can come in for the weekend and have access to train our students. And you can give them a certification at the end as an added certification. We'll give you the space, but you're going to pay for it all

obviously, right? Because it's in your best interest to do it."

So I think there are some best practices where we can think about those sort of bolt-on trainings.

The latter half of sort of what you ended with really is about exposure. And what's interesting is in some of the research that we've done both labor unions and communities of color have high degrees of skepticism around the real opportunities that exist and want to see it happening before they're willing to commit. And there are different reasons for it right, but that's the whole labor union model. Like, "We don't ramp up, right? You just bring us the openings and then we find the workers to come in."

But also in communities of color they want to see that it's real, because it's a real commitment to enter into the space. So I think that there is a strong, important element around getting the timing right on all of this, on the activities and making sure that the jobs are available at the end, which we can learn a lot from the apprenticeship models of the building trades in that way.

One last suggestion that I'll make to give a shout-out to some of the community colleges in Southern California is one of the more successful programs, I think that came out of the ARRA stimulus money where the public

workforce system partnered with the community colleges in Southern California was around pre-apprenticeship. And I think that's the key here, which is there's obviously a very strong commitment to create lots of construction jobs. There's a strong commitment for many of these activities to be under project labor agreements and to be requiring prevailing wages and also union representation. But there are some significant barriers to getting into the labor union that do have to do with sort of whether it's national electrical code or other sort of prerequisites that are required.

So Palomar College was kind of a really good example of a solar apprenticeship program about ten years ago, a pre-apprenticeship program that would feed into IBEW or could feed LIUNA or these other labor unions. So I think that's a great place for community colleges to play. Already a presence, already a trusted institution throughout the state broadly and with a diverse student body. And can play a really critical role in developing those pre-apprenticeship programs. And making sure that the folks who have been working in hospitality and tourism or the ones who have been long-term unemployed, are aware of the opportunities and are prepared to enter those apprenticeships as the jobs come online.

COMMISSIONER SHIROMA: Thank you. Thanks, Phil.

(Overlapping colloquy with multiple speakers.)

MR. ROLAND-HOLST: Cori, do you mind if I ask you -- because you're going to be more authoritative about details than I am, but I want to insert myself if possible between Philip and Cori, because in a sense I agree with both of them. Cori's emphasis on fast-tracking skill development is really essential in this category. And I know this, because I've been part of this system for a long time.

As you know, the UC, CSU, and junior college system is one of the most successful experiments in the history of public education. But frankly for when it comes to technology, innovation, and deployment it's been very hierarchical. And I think we really need to get more of the skill development through this system to permeate the whole pyramid of the system and improve access to skills at the community level. If we're going to do that we can't rely on multinational electronics companies, we've got to rely on local training institutions to bear part of the public costs of these things and to localize the skills.

And in that sense I agree with Philip, but I would say that there's really an important role for the public sector. He's not denying that, but I think that I wanted to double down on that and say we need to come up with new programs that don't require a decade of student

debt to develop skills that are marketable.

And in that sense the Europeans, they have some good examples of parallel tracks for people who want to go on to collegiate education, those who want to have marketable skills within a year or two after graduating from high school. And I hope that that's what Cori is also talking about, going to give us ideas about, is how to essentially fast track skill development at the local and community level. Thank you.

MR. TAYLOR: Neha and Cori, you both had something to say? Go ahead Neha.

MS. BAZAJ: Yeah, thank you, Gabe.

So I do, just harkening back to my presentation, I do want to again draw a distinction between residential construction or retrofits as we however we want to talk about it, and commercial retrofits or construction.

I think the construction unions are great. There are very clear career ladders and progression to increase your skill and your wage potential, love for your apprenticeship programs; all of that is wonderful and I don't want to take away from that.

However, that is not the pathway for most residential construction jobs. And so, again, we cannot just ignore potentially 40 percent of all jobs that are going to be created in the building electrification

transition. And so there aren't clear career ladders and wage progression ladders in the residential construction field, there aren't clear pathways into that. Maybe you know somebody who does that sort of work and though you're able to -- these are small crews that are residential construction companies. And so yeah, again just reemphasizing that 40 percent of all jobs, we need to do some creative thinking about how to retool or create pathways into that work.

MR. TAYLOR: Cori?

MS. JACKSON: I agree 100 percent with that comment about residential. To circle back to the Commissioner question about what there might be that the Commission could look at, I would say from a very practical perspective that workforce development, training, and education programs have not been a priority for some of the existing funding that the Commission does have available to them to disperse.

In particular, I'm thinking about its EPIC program, which is where research dollars funded by California ratepayers CEC manages these dollars. And I know that education workforce development have not been a big priority of that program, although they could fit nicely into sort of the market facilitation responsibilities that come along with managing those EPIC

dollars.

So I think there's some things that could be done within the Commission to prioritize education that have not yet maybe been explored. And I would encourage the Commission to look at prioritizing workforce training and education in its existing programs.

And a second piece is really trying to -- and I think Siva, Commissioner Gunda touched on it early -- trying to quantify the soft benefits, the energy and the carbon savings benefits of education. It's difficult, it's not a clear link always between the training and the reduction in a ton of carbon or in a kilowatt hour. But I really encourage the Commission to take on that work and try to put a metric on those soft benefits. Even if it's not perfect to first go around to iterate on it and take it on for the future. Thank you.

MR. TAYLOR: I believe Commissioner Monahan has a question.

COMMISSIONER MONAHAN: I do. I want to actually build off the question that Commissioner Shiroma raised around the community colleges and how do we accelerate the investments in community colleges to support this job gap.

I mean what is a challenge is also an opportunity, right? We have a lot of jobs in this sector, we have a lot of people that need jobs, so this is like

kind of a no-brainer. How do we accelerate investment in training? And I agree that we should be applying state dollars towards workforce development, but how do we get into this? How do we highlight to the community colleges that this is a huge job gap?

So how do we get more information about wages, real wages like for the build-out of ZEV infrastructure for the installation of HVAC? I didn't see that pulled out in any of your presentations, the amount of money somebody could make a year in these sectors. And then it just seems like well, there must be a way that we could get the community colleges to see that this is an opportunity for jobs with the people that are attending, going to those institutions.

And Commissioner Shiroma, like you I am a product of community college education. Actually I'm the youngest of seven and we all went to community colleges, because that's what you do when you don't have money. And it was like an amazing platform for me and my family in our sort of trajectory.

So I just think to scale up the amount of dollars that we can put towards workforce just from our institutions that's one source, but really it's like prioritizing this in the community college system.

Am I getting that right? I mean, you can say

like, "Oh no, that's completely wrong." I would love to hear any comments in that direction.

MR. JORDAN: So I'll be very, very brief because I don't want to take up too much air time here because others I'm sure have comments. But know the jobs generally do pay quite above the median wage. And I can put in the chat, I'll put in a report that we worked on at a national level and has some state-level data on the premiums paid across the different industries. It was a two-year effort that we did with NASEO and the Department of Energy, so they are good jobs.

I think part of the challenge that we're facing here is that when we look at the supply of talent that is available to enter into the workforce, meaning people who have either -- who are unemployed or are working in lower wage fields often need supports that go beyond just free college.

And so Skyline College is working on a very interesting program that has been successful. It was started in New York with the City University of New York system, which is called the ASAP program. And Skyline is piloting this in California. And basically it unlocks a substantial number of resources that are either existing resources or brings to bear new resources to help people persist in college. And so I would very much encourage you

to check out that Skyline program, because it really attacks many of the things that are the core elements of the trauma of poverty that people are living in.

So it addresses transportation security, food security, housing security, stipends, lots of things that are really necessary for people where free isn't free if it means you have to stop working and you're the only thing that's putting food on your table.

So I'm going to stop talking, I'm going to put those in the chat. And the rest of the panelists have more to say on this than I do, I'm sure. So I will put those in that.

MR. TAYLOR: We are running a tad short on time, but we do have two comments in the Q&A as well.

Oh, go ahead, Commissioners.

MS. JACKSON: Could I add one response to Commissioner Monahan before we move on? Just to let you know, Commissioner, the community colleges recently -- I don't know if they're still managing this program -- but they took on exactly what you're saying. Trying to identify gaps in workforce and jobs that they could fill, even looking at four-year programs that they could offer, which they're allowed to do if a university system, four-year college doesn't offer. But they were calling it workforce or sector navigators and they were staff across

the system that were tasked with identifying those labor gaps and building programs around those gaps and future workforce needs that would be coming.

So we might want to look into that and look at that model as something that could be useful going forward, because I know they had invested quite a lot in that model at the community college level.

MR. TAYLOR: And Kristy Chew from the CEC staff will read off a few of the questions from the Zoom chat from the public.

MS CHEW: Hi, this is Kristy Chew with the Energy Commission. One question slash comment was from Anna Solorio, "Growing up in a union household many years ago, I want to point out that many small contractors in California are currently minority- and women-owned. So high-road solutions become more complex. Workforce solutions should include targeted focus on these businesses and growning these businesses to sustain higher wages. Not sure if anyone wants to comment on the women-owned, minority businesses.

MS. BAZAJ: Yeah, I can jump in.

MS. CHEW: Great.

MS. BAZAJ: And thank you for theh comment and question, and 100 percent agree that we need to support small-, minority-, and women-owned contractors and also

agree that high-road solutions become more complex. I do think this is where we certainly welcome input and collaboration from those small minority and women-owned contractors to figure out what the solutions are to become high-road. High-road in the small contracting field doesn't have to mean the same thing as high-road in large commercial, union context. So you know, high and low road, it's not just wages, it's you know a whole package of elements of the job. And so I think welcome the collaboration from those contractors and figuring out what that looks like.

MS. CHEW: Does anyone else want to comment on that? If not, I'll move on to the second question. The second question is from the East Bay Community Energy group. "I feel there is a tension with the desire to put disadvantaged communities and underserved communities at the front line with concerns over increasing utility bill costs. Do panelists have recommendations for program design to balance these competing needs?"

MS. JACKSON: Cori, from U.C. Davis. I can make one comment. A program that we've been looking a lot at with the potential to reduce costs and help to sort of reduce carbon and stabilize the grid is actual real time pricing, and so that is dynamic pricing that's going out in probably five minute increments to consumers and to

ratepayers across the state and there's studies out there that show that real-time pricing even if, when it's available and even if consumers, ratepayers are not taking advantage of the kind of planning they can do around real-time pricing that they're still generally saving money on their utility bills because prices for energy are, high prices for energy are often aligned with times when folks are at work or away from the home. So I think there's some very specific programs around real-time pricing that we could look at here in California, that I know are being looked at outside of the state and used outside of the state in a more progressive way.

MR. ROLAND-HOLST: I really support Cori's suggestions in that area and I'd also encourage that the Commission consider research funding to better understand the heterogeneity both the needs and the behavior patterns that's been alluded to several times. The complexity of behavior, particularly among underserved communities and the constraints they face. Tony made that point very directly when he talked about the experience of local adversity and how that conditions people's behavior and makes them skeptical of institutional solutions, all kinds of dimensions of this.

And I really think we need to improve the information available before we start talking about

targeting, but targeting will be essential, because as I said in my presentation, you know, diversity is a beautiful resource in the state of California, but it makes policy very challenging and that doesn't excuse us policymakers from addressing it because that's the only way we can havea long-term, inclusive and sustainable remedies, but I really feel that we need to improve both public and private information to make this a more effective process.

MR TAYLOR: Thank you so much.

Oh, go ahead Neha.

MS. BAZAJ: Sorry, very quick comment as we're talking about incentives for new technologies. Again, you can target those incentives towards those who most need the funds to make those changes and it doesn't have to be the same incentive across.

MR. TAYLOR: Thank you all very much to all the panelists. We are ready to move onto our next presentation. Any last final comments from the Commissioners? Go ahead.

COMMISSIONER SHIROMA: At the CPUC of course we voted to raise rates to fund all of these programs. I will tell you that on the CARE, ESA, FERA program – the ESA Program, the Energy Savings Assistance, again $2.2 billion over the next few years. We have been tracking the investor-owned utilities' expenditures, and their hiring of contractors. They over these past few years, they have

actually been not been spending all the authorized monies. I think we feel that there is a view in California that it is worth it for all of us customers to help defray these costs, that in the end, it does help all of us, and so we authorized the expenditures. It is actually still -- even as we're talking about billions of dollars, it is still a cost-effective effort. And in saying cost-effective, we've also authorized, in the Energy Efficiency Program an equity piece that isn't tied to cost-effectiveness, but rather what we're calling a total system benefit, an effort to really infuse those energy efficiency monies into low-income and disadvantaged communities. To again just increase the amount of energy efficiency measures within these communities, so I'm hoping that we are on our way to actually implementing much of what has been discussed today, but meanwhile what you have provided is a means to further infuse this into the workforce, to really jump onto some new ideas.

And, by the way, on the EPIC funding, yes it's the CPUC that provides those funds to the Energy Commission and so the CPUC needs to take a look at what other flexibility can we give to the Energy Commission on the use of those funds for the workforce, I will own that piece. Okay, thank you.

MR. TAYLOR: Thank you very much, all. This has

been an excellent discussion and, obviously, turning it back over to heather for the next presentation.

MS. RAITT: Right. Thank you so much, Gabriel. And thank you again to all the panelists. That was really awesome.

So next, we have Sarah White, who is a Senior Advisor for Jobs and the Economy at the Governor’s Office of Planning and Research. Go ahead, Sarah.

MS. WHITE: Great. Thank you so much. Hi, everyone, I am only sorry to say that I was not able to join for the full morning's conversation. I rejoined in the last five minutes and I think I have about 20 additional things I'd like to say that I won't have time for. So the good news is that you have a whole other panel coming after this, which can address I think many of the really interesting questions and issues raised by the morning's panel.

Anyway, I am I'm Sarah White. I am the Governor's Senior Advisor for Jobs and the Economy, working in Office of Planning and Research. And we are preparing, together with the Labor agency, to release a Just Transition Roadmap later this month. And I want to talk a little bit about that with you and how that intersects with the decarbonization conversation. As well as a number of related investments in the new budget, including a $600

million Community Economic Resilience Bond, which is implementation of Just Transition planning in the state.

So I'm going take it up a little bit higher level. Talk about some strategies for transition and the high road and then intersect that with decarb before we move back to, I think the conversation that excited my colleague, Shrayas Jatkar is facilitating after this, which really I think talks about the way that just in response to some of this morning's conversation the Labor agency at the state can be at the center of coordinating many of these questions about connecting supply and demand in the labor market. Instead of having sort of a fragmented set of workforce investments across agencies, but that have one place that actually directs and coordinates a high-road vision for workforce development across agencies and investments and industries.

So that's some exciting work coming up, and I just want to refer to that because that's a critical part of our Just Transition Plan.

So let me just say that I want to talk a little bit about the high road transition or the Just Transition Plan that we have. It aligns very well with some things we heard this morning from the Commissioners, as well as from the Biden Administration. I was excited that Commissioner McAllister kicked us off this morning reiterating the

Energy Commission's commitment to equity and to inclusivity, as well as Commissioner Shiroma talking about the CPUC calling for accessible high-quality jobs. That is the fruition of many years of work. Those commitments are part of a decade of work in California, which is now leading the conversations on this sort of transition.

So to have the leadership in our energy and utility institutions calling for job quality and equity is really remarkable and I want to thank you for that leadership.

I want to say also before moving into our definitions of Just Transition, that the way you've set up this day really reflects, I think, best practice in energy workforce development. So the first commandment, as you all know, is know thy labor market. We never start with the training. You start with where the jobs are, what are the jobs, and what are the skills we need? And then you build training partnerships to meet those skills and throughout all of that we emphasize equity.

And in the labor market, we know that this means a variety of things. It knows that, like for those of us who work with and among energy agencies, we know that what we do, our energy policy impacts labor markets. We are going to create jobs, good jobs or bad ones. But even without intending to create jobs, we impact the labor

market. So being aware of our policy investments matters a great deal. As well as then we have workforce policy, which can build access into those jobs, which is the way that we describe equity. At least equity in its sense of reducing economic inequality, so building accessible pathways into quality jobs is a way that we get equity in the labor market.

So those are the things. That seems to be the way that the day is structured. We heard this morning, and this afternoon we're going to hear how that works in practice. California has done some amazing innovation in the workforce sector around a lot of things, including construction and energy efficiency and renewables.

I think it takes a lot, I just want to remind folks it takes a lot to move from understanding the aggregate shape of possible jobs that could occur if we have these investments in things like decarbonization, for example. But moving from that to actually creating those jobs and building pathways into them at real job sites in actual regions of California, it is a hard thing to do, and to do well and do systematically. And so I'm pleased that everyone here is working on that, but we do have plans and strategies for that.

So I just want to thank again the CEC team for inviting me to talk a little bit about Just Transition and

for organizing a workshop that follows these lines of best practice in workforce and clean energy workforce practice. So, this is great.

I'm going to zoom out a little bit here just to talk briefly about Just Transition. For us, Just Transition is -- and this is a very loaded term, I'm not going to into its history or its politics -- but let me say at its broadest Just Transition is a transition to carbon neutrality that serves all Californians. It is so that everyone, including populations who traditionally have not been at the table making decisions, can share in the economic and the health benefits of carbon neutrality; in this case the benefits of deep decarbonization.

So this transition, I want to say also we call it a high-road transition -- more on that in a minute -- but it looks different in every region, in every industry. The economic transition of California to carbon neutrality looks different in a Sierra community, in a forested community, in the agricultural valley, on the coasts. You know, oil and gas in Kern looks very different from oil and gas in L.A. The work on forestry in the mountains looks very different than the work on ag and drought response in the Valley.

So the high-road transition is not driven, as we see this in the administration, is not driven simply by

climate and energy policy. But also by climate change itself, right? How the economy responds to fire and drought and flood and the macro-economic forces of globalization. So the energy transition is a huge piece of that, but we're also looking at a broader economic transition related to climate policy that is in transportation and agriculture and forestry and climate resilience and a lot of other things.

I saw actually that there was a great comment written right before we left the last session that asked us to think about moving directly from fossil fuel jobs to green sector jobs. And I think one of the misconceptions about the labor market is that there will be simply a one-to-one replacement of green jobs for fossil jobs. But it is much more complicated than that. And it doesn't look like that really, right? We're talking about jobs across industries and occupations.

And one of the things that we found in our work is that there simply are -- and decarb might be a slight exception to this -- but for the most part there's simply not enough high-quality jobs to move people whose jobs are being disrupted into. We have to think about job creation as much as we think about job training. And I think that's unusual. I think a lot of us like to start thinking about job training as a way, a pathway to equity and mobility,

but what we first have to think about is creating the jobs for people to move into. So that's what the high-road transition is about, in part.

We were part of the Executive Order last fall asked the Labor agency and OPR to come up with the Just Transition Roadmap, but really to also consider what it means to transition the economy post-pandemic. What is it, what is economic recovery, in addition to transition look like? What does it look like not to simply transition away from fossil fuels, but to transition to an economy which actually has less inequality. And is that more inequality between communities, between peoples, across regions of California in many ways.

And so that is a large task of the Just Transition Roadmap, and in fact of Governor's Newsom's California Comeback Plan, which is part of the budget.

So this is a very intersectional approach. I want to say I appreciate the comments earlier about how complex it is to do workforce training when your goal is equity. I think that for us, in Just Transition, we are thinking not just about workers whose jobs have been disrupted, but also workers and community members who have not had access to good jobs in the first place.

A traditional Just Transition conversation looks like, we have a new technology or a new industry direction

that's going to disrupt some old jobs. Let's train those folks for new jobs. But we know that it is simply not about this. It's about creating enough opportunity to move folks into different jobs and creating opportunity for everyone, not just for those who are perhaps having their jobs disrupted. But there's a lot of folks who have been languishing in the low end of the labor market for decades. And we want to make sure that we're creating opportunities for them as well. So that's an intersectional approach.

The other piece, as I mentioned, it's not just about training. In many cases, in many industries, we're talking about a good jobs shortage, not a skills shortage, right? So the good news is that as I'm sure you have heard, decarbonization is going to create a lot of high-quality jobs. Done right, it can do that. So what it means strategically is the Just Transition Roadmap. And let me just say very briefly what this is to sort of locate us in context.

So the elements of Just Transition include -- there's five of them. They include economic diversification. This is a long game. This is how California builds its quality jobs in a carbon neutral economy and how we rebuild local tax bases, which is a whole other question that this relates to.

We also have a series of work-around industrial

planning, which is what this conversation is about, right? What does it look like to transition a particular industry? What does that mean for jobs and workers and communities and businesses?

Then we have a bucket that's around workforce development. We know what the jobs and the skills are, so how do we deliver the skills necessary to achieve decarbonization and how do we define what those jobs are and who has access to them?

There is also a bucket of work around safety nets. That's part of Just Transition, which is what do we do about workers whose jobs are being disrupted? Who maybe cannot move easily into a new job or equivalent job. What kinds of social supports do we have for them?

And then finally addressing all of these issues, Just Transition is primarily for us about regional partnerships. What does this work look like on the ground in local economies, in local labor markets? And how are those decisions made?

This is also where you're going to get the best workforce answers. We can do things systematically as a state, but we are committed to helping regions develop their own solutions to figuring out what the jobs look like and what the skills look like in their local labor market. So they connect directly to institutions moving real people

into real jobs rather than just doing this at a sort of abstract economic level. So those are the elements of Just Transition.

Laying over all of that, I will say is a set of high-road values. I've heard the words "high road" used a lot in the last year, which is tremendously exciting. I know we're using it to mean a lot of good things in the labor market. I will also just want to remind folks that it's a term of art. There's a very specific set of economic development and workforce development policies and practices. And it's based on a set of values, which include equity, which includes sustainability, which is not just carbon neutrality, but paying attention to environmental issues as well. It looks at job quality and competitiveness. And it looks at, for the lack of better word, democracy or inclusivity, right? How we make decisions in a transparent and inclusive way. So all of those things come together in a high-road approach, so we apply that to our transitions. And you'll get what you'll see in our Roadmap and our website is very complicated intersectional system that actually will work with all of the institutions that you are talking about reforming today.

So let me just bring that back briefly to something very practical, which is the Community Economic

Resilience Fund. I don't want to spend a lot of time on this today, but I do want you to be aware of it. This is a fund, a $600 million fund, which is invested, which is going to invest in regional collaboratives in every region of the state. Particularly those which have not had a lot of support from state or federal funding.

It includes these collaboratives, includes the usual suspects, but primarily provide access for labor and community to join the table with business and government and education and others. And this speaks to the broad approach that Tony Reames described this morning from the Biden Administration, the whole of government approach. These collaborators are going to coordinate federal and state infrastructure investments, as well as all the community capacity building work in the budget that is funded to make sure that communities have a voice in this work, in this Just Transition work. And they are going to do really careful labor market and economic development planning and prioritize the investments for their local labor markets.

And then we have a series of investment grants up to 500 million that are going to go out to actually build these projects in these communities or build the projects that they choose. And decarbonization I imagine will be a big part of that. So I think that integrating the decarb

conversation into this regional work is going to be the next step that I think is tremendously important. So we'll want to be sure to work with you as we roll out that Community Economic Resilience Fund to make sure it's jiving really well with the work that you're outlining here.

That is a lot. It is very high level. I'll leave it to my colleagues this afternoon to talk about what that looks like in practice. And I'm happy to entertain some questions before we move into the meat of the afternoon, so thank you very much.

COMMISSIONER SHIROMA: This is Genevieve, for one question.

COMMISSIONER MCALLISTER: Go ahead, Genevieve, yes.

And this is Commissioner McAllister. I'm back, but certainly a great conversation and thank you for the last panel as well. Thank you, Sarah, for being with us. That's really helpful.

Go ahead, Commissioner Shiroma.

MS. SHIROMA: Okay, yeah. We've talked -- thank you, Sarah, we've talked about community colleges, about pre-apprenticeship programs, apprenticeship programs. The private sector training their workforce, what have you. I was wondering if there is a stronger role for a community-based organization. For example, I took my dad to do his

taxes at a CBO called Asian Resources here in Sacramento. And they helped him navigate getting that done. And then at the end, the fellow who was helping us said, "Here's my card. If you know anybody who's looking for a job, please help have them contact me."

MS. WHITE: Wow.

COMMISSIONER SHIROMA: That was fantastic. And at the CPUC we are really looking at how can not only our investor-owned utilities, our regulated utilities partner up with community-based organizations on a whole host of things, while we as a state agency partner up better with CBOs. So I'm just wondering if OPR has a community-based organization effort going on as well.

MS. WHITE: Absolutely, Commissioner. That is such a great question and what a lovely example, right, one great example. So I think you'll also hear more about this from my colleagues who are going to speak shortly. This is critical to the model, this partnership model that we tend to -- we all work in silos, right? And we all kind of want to do everything. So the colleges want to do everything. And the workforce boards want to do everything. And the CBOs want to do everything, because it's you're driven by mission.

But the fact is that everyone brings different skills to the table. So what we have modeled, both at the

Labor agency and the Workforce Board, and in our Just Transition planning and the Governor's Office, is around building partnerships. So, for example, even thinking about workforce and energy, the CBOs have a huge role to play. And they not only provide support for a variety of participants, but they also outreach. They know the communities. This is how you get -- this is where you reach the people that you're trying to reach and include. This is the outreach of CBOs is a critical piece.

And you know the colleges are fabulous at training. They need to do some of the training. The colleges are educational institutions. They also have deep community roots, so are good there. But you know the same way that the workforce boards can bring in financial support for additional programs. The way that connecting to actual apprenticeship programs once you've brought people in the door, will help people advance in this market.

So I think that you're absolutely right. CBOs have to be at the center. I see them at the center in two ways. One is as a feeder and a support for people in joining the workforce programs. But also in this larger question of deciding what their local economy looks like and making some investment decisions as well.

We would like to expand the role of CBOs to be

one which helps decide on community visions for their future economy. So it's not just the state deciding what your local economy looks like, but that they have a voice in that as well, so great question.

COMMISSIONER MCALLISTER: Can I follow up on that actually, Sarah? Just and I was thinking along those lines and you articulated the question much better than I had in my head, thank you, Commissioner Shiroma. But yesterday we heard over and over again that -- and I think we really tease that out in the discussion as well -- that the state agencies are kind of uniquely not good at getting into local communities in ways that are really relevant to those communities; particularly where you have historically disadvantaged and a huge diversity. And you just have to have a situational awareness on the ground that a state agency is just kind of not set up to have.

And so obviously, some do it more than others. But in the energy agencies we tend to be relatively centralized. And so there were a few ideas that came out of that discussion. But basically the gist of it as resources to really treat CBOs as infrastructure. So that we can't -- real resources, real monetary and other resources to really empower them to get that decision-making process happening at the ground that reflects the communities' priorities. And then figuring out, you know,

together with the state agencies and local governments etcetera, all the players you've mentioned, to kind of tease out the priorities for that locale. And really prep for whatever the implementation is going to have to look like.

So is there some discussion of how the CBO network can actually be resourced?

MS. WHITE: Absolutely and it's such a great -- and it's such a perfect moment for this conversation. I'm so delighted that it's coming up in this way here. Let me say that so there's two things. One is we are coming to similar conclusions about what's the highest best use of the state in this, right?

And so one of the things we've come to, especially thinking about this community economic resilience, is that the state -- we have many roles. We're not a regulatory agency, so we have a slightly different role. But we do say is that, wherever we are giving out funds to support people, we can we can do two things. We're not going to tell people what to do with the money. But we're going to say who has to be at the table. We're going to put some strings on the money that says you have to have communities at the table. And not just because you got a letter from the CBO, but there's an actual participatory voice there as well as for labor and workers.

So we can say who's at the table to make sure we're setting a full table.

And then we can also make sure that the investments, whatever they are, follow a set of high-road values, right? So we're not going to say you have to build this industry, but we're going to say when you do you have to pay attention to, for example, job quality and accessibility. So the state can put those kinds of directors on the money, if you will.

But a really specific example that we've written into the Community Economic Resilience Fund, and which is also funded independently in the budget this year depending on the final negotiations ,of course, is something that came out of the Legislature known as 1072. It's called Regional Climate Collaboratives. It's not a good name, because it's not regional. It's not collaboratives. But what it is, is it's run out of the Strategic Growth Council. And it is direct investment. We have $20 million invested this year to work with community-based organizations in local places to participate in these state and local processes.

So I mean what you often find is that folks don't even have the -- they don't know where the meetings are happening. They don't have child care. You have to pay for them to take time off with work. They need

transportation to a meeting. They need to understand how to organize and participate, right? And there's also a lot of local wisdom, so it's also sort of not just building capacity but harnessing that capacity.

So there is, as I know right now there's $20 million in the budget directed specifically to helping community organizations expand and participate in those kinds of decision making processes. And there needs to be more right now, because there are also very many of those. And it's not enough to cover everything, but that's one place that we're seeing this move ahead.

And I also like that model, because it helps instead of each agency, energy agency or labor agency and CARB all setting up their own community processes, you get together partnerships with folks where they can all join together in in modeling those conversations. So that's a great question.

COMMISSIONER MCALLISTER: Beautiful, thank you very much.

Any other questions from the dais before we move to the next panel?

COMMISSIONER GUNDA: Commission McAllister, I think this could be a very long question. So just if we can follow up around this. Thank you for your work and I just want to recognize Shrayas's work too. He's been

incredibly helpful for us in advising on the SB 100 process.

So I think just at a very high level, when we framed at the top yesterday, the equity question right, as we transition. You know, there was a solid recognition and the commitment across the leadership to ensure that we really prioritize those that have been left behind for a very long time right. So that's something we will do.

But there is also this active recognition of not creating new groups that will be disadvantaged in this transition. And I think this goes to your comments early on, on how complex it is to think about the job transition. You know, like it's not one to one. So as with any good policy right, I mean it's like if your data driven with a number of scenarios to really help frame this, would you be able to at a very high level just provide some level of confidence that there are pathways? To ensure all Californians will move forward in this transition, no matter how difficult they are.

And just kind of at a very high level that there are pathways, it's going to be challenging, but we can do this, would be a really good thing to hear from you.

MS. WHITE: So I want to be careful about committing the state to saying that we're going to care for every California and guarantee their jobs. We're not

making jobs guarantees, but I think there are definitely pathways.

One thing we find in the Just Transition work is there is no one place in this country or other countries where anybody has done this, all together, in a really perfect successful way. But there are examples in each case of things that really do work. And what we're trying to do is lift up each case and apply those lessons here.

So there are ways that we can effectively support people in transitioning careers. There are ways that we can effectively support people if they are going to move into early retirement. There's ways that we can effectively support people moving from low-skilled jobs to high-skilled jobs. There are ways that we can make bad jobs better. We can create good jobs. Yes, we can do all of that. It's not seamless, right? And there's not a silver bullet. And there's, not a single Just Transition policy that will do that. But I think we can do all of those things.

But it's a big lift and it requires a lot of coordination, another thing that we're not always the best at. So I'm looking forward to working with all of you to sort of bring that together.

So I say yes, I do see it as a source of hope. I also think the clean energy transition is one of our

leading sources of hope, because this is a place where you can create lots of good jobs now, right? And we can move into that, so I think that this is -- working in this sector is a place that gives me a lot of hope that we can do this transition right.

COMMISSIONER GUNDA: That's good. That is beautifully put. Thank you. And I think it seems such a big lift and then just kind of having one of the key elements that we took away from SB 100 was it's technically feasible. Just having that kind of sets the regulatory certainty in kind of moving the ball forward. And just kind of having that high level, yes it's achievable, in making sure most of us are carried forward. That it's the training or whatever it might be, is a good kind of hope to carry together as we move the transition forward. Thank you.

MS. WHITE: Agreed, thank you so much for that comment.

COMMISSIONER MCALLISTER: Sarah, thank you so much for being with us. I just want to do a last call, we're a little bit over time, a last call for questions from the dais? I know we know where you are, and you know where we are, so we can keep getting in touch.

I did --

COMMISSIONER MONAHAN: Yeah, and I've got to say

I don't have a question but, Sarah, I'm really hoping we can follow up separately. Because I have some really specific, targeted questions for you on zero emission vehicle infrastructure. So it would be great to pick your brain.

MS. WHITE: For sure. I'm available, so thanks everyone.

COMMISSIONER MCALLISTER: Great. And we did have a couple of questions come in from the Q&A, just asking for the link to the community resilience efforts that you refer to. So if you do have a link we can post it in the chat or we can follow up later.

MS. WHITE: Let's follow up later. I can give you the best folks to talk to you about that.

COMMISSIONER MCALLISTER: Okay, great. Perfect. Thanks very much all right. Well, thank you so much, Sarah. We really appreciate all you're doing, and the whole team at OPR, and appreciate your being here today.

So with that let's move on to the next panel. Heather, do you want to introduce Shrayas and our panel?

MS. RAITT: Sure. We have Shrayas Jatkar and he is a Policy Specialist on equity, climate, and jobs at the California Workforce Development Board. Shrayas works to address good jobs, environmental protection, and access to quality training and employment in a holistic way.

We are very pleased to have you here, go ahead.

MR. JATKAR: Yes, thank you and I'm so grateful to be part of the workshop today and that this workshop is even happening. You know, two sessions on workforce is pretty impressive.

And so yeah just very quickly again I'll say again, my name is Shrayas Jatkar here at the California Workforce Development Board. For those who don't know our agency, we are one of seven departments within the State's Labor and Workforce Development Agency and I'll both be moderating our final panel of the day and speaking as well.

So very quickly I just want to mention who our two other panelists are that'll go after me. Julia Hatton is the President and Chief Executive Officer for the Rising Sun Center for Opportunity. And Randy Young, is the Codes and Standards Representative at Sheet Metal Workers Local 104.

And for the CEC folks, it may be interesting to point out that both Julia and Randy have a connection to the Energy Commission's Prop 39 program. Rising Sun was one of our grantees under the Prop 39 K through 12 program where we were investing in multi-craft pre-apprenticeship, which is great to hear has come up quite a bit so far this morning. And for those who may not know, Randy was appointed to the Prop 39 Citizens Oversight Board earlier

this year.

And very quickly I'll say that we were hoping that we would have a couple other panelists. One person had a family emergency unfortunately and couldn't join us this morning. He would have talked mainly about the community colleges, which again has come up quite a bit. So unfortunately we don't have James with us today, but I just wanted you to know that we had tried to organize that.

And we had also had requested somebody from Southern California with a community organization that's been involved with the utility pre-craft trainee program. A very exciting long-standing program that's been developed between the LA Department of Water and Power, community-based organizations like SCOPE and the Los Angeles Alliance for a New Economy, and IBEW the Electrical Workers Union in the L.A. area.

But unfortunately it's just the three of us, but I think you'll get a good show here from us to hopefully hit on some of the things that have come up before in the morning session, that we can go into a little bit more depth about.

And before going into it, I just want to really acknowledge and appreciate the conversation today. I've been with the State Workforce Board for a little over three years. I came from the public interest advocacy realm

before that, where the conversations with agencies like the CEC were actually very much about like, why should the CEC care about jobs and workforce? So for today, the conversation to be focused on how and what the role is of the CEC and even the Public Utilities Commission, and how we're addressing workforce and all the talk around equity and inclusion and job quality and access, it feels night and day.

So it's a really great testament as I think Sarah mentioned to the work of advocates for many years, the work within agencies for many years. And I think this is this is going to be a great session.

So to just distinguish our panel from the previous one a bit I think we're really trying to get into the "how." How do we get there? How do we support the building decarbonization measures that are needed? And how do we support California's transition to carbon neutrality? So I think with our panelists you'll hear maybe a little bit more of the sort of operations. And a little bit more of the ecosystem, not just on the training side but also about jobs and employment, which I know others spoke about earlier.

So I think you know first to say when we think about like well how do we get here or to get there, what's that endpoint? And so, in my mind, what I was thinking and

what I've heard so far today, is that we really have sort of four key objectives.

The first one is you know sort of the most basic, do we have enough workers in California to get the job done to actually decarbonize and electrify our buildings?

That we actually achieve the energy and emission targets that we set out by making sure we have quality work being performed that actually hits our targets.

And importantly, I think, where we're trying to go, is making sure that the work, the investments to decarbonize our building, support quality jobs and support greater access to those jobs for target populations.

So I think all of those things kind of you know -- to set that framework I think is important, and I think as has been noted I think this is the high-road framework. And I don't have a very clever joke, but I just want to say that I think today's workshop sets the record for the use of the term high-road in a state agency workshop, which is tremendous.

So let me just say a bit about the high road and what it means in terms of sort of operationalizing. I think Sarah said a lot of this already, so some of it is repetition, which might be helpful but hopefully I'll add a bit more.

So, when we think about a high-road approach to

economic and workforce development, as has been said, we start with the jobs and not with the training to really understand what's the real demand for labor and workers. The modeling provides again that sort of big picture of what's possible.

And it's then turning to creating an establishing industry-based training partnerships, as was mentioned, where we actually understand who's hiring for what, when; the real sort of actionable pieces of information to develop workforce training and understand how we link the supply side of the labor market and the demand side of the labor market. How we connect training and jobs to one another.

I think one thing that's important to say here that hasn't been mentioned enough, is that this focus on building industry-based partnerships -- and "industry" is a broad term. We don't mean that as a business focus, but as an industry sector if you will, that this is also about meeting employer and business needs and interests. That, in fact, an equity agenda is only an equity agenda insofar as it connects people to industry demand for skills and the knowledge that's needed. And so as much as the high road is, is absolutely about addressing inequality and ensuring workers have access to good jobs.

It's also ensuring that employers have access to

good workers, skilled and trained workers. And that they are remaining competitive as we move towards carbon neutrality.

Many folks have said this already, but it really bears repeating, which is that to get to equity we need to have quality jobs. They go hand in hand.

I'll leave that for the moment, and just hit on this last point, which I think has also been sort of addressed a bit. And I'll say more about this, is to really address equity, to create the pathways for new workers into the occupations and the industries that are going to be relevant in building decarbonization, we have to think about different treatments for different types of workers. And when we think about new entry level workers, it's really important to think about comprehensive foundational training and supportive services that I think a few folks have mentioned.

And that really is what we at the Workforce Board have piloted for the last several years with Prop 39 money that was invested in our High Road Construction Careers Program, so I'll say a bit about that in a few minutes. But I wanted to start with the jobs as we often promote here.

And so again I think a lot of this has been said, which is tremendous. So bear with me here. I think one

point, and I think it was Neha who made this most clearly, is that we need to understand as a starting point, that the "clean energy work" is embedded in the existing industries. And we need to understand the dynamics and the structure of those existing industries. So that we are again paying attention to the kinds of interventions needed to ensure job quality, job access, and quality work, right?

So mainly in this sector we're talking about, you know, the construction industry when it comes to both building retrofits and installing more renewable energy to meet a higher electrical demand. This is, you know utility work. And there's some jobs in manufacturing. And we need to understand, again as I think Neha pointed out, that each of these industries has high- and low-road employers. And so our job, I think, is to make sure that we are paving the high road and closing off the low road.

Just as we don't just magically have greenhouse gas emission reductions, but we have deliberate policies that mandate that. The same way, we need deliberate policies and interventions that mandate good jobs and better access to them.

And so I think I'll just very quickly say this is where the Energy Commission and the Public Utilities Commission actually have a unique role to play. I think this is a role that only actually agencies like the CEC and

the CPUC can play, which is setting the terms and conditions on grants, on contracts, on any investment to ensure good labor market outcomes. Again, we already do this with our energy policy to ensure good environmental outcomes. You don't get a rebate for buying any water heater. You've got to buy one that meets, that's above and beyond industry standard, right? And so it is the same, I think sort of theory of change if you will, that we need to set a high bar. And pave the high road with clear terms and conditions on our investments.

And this is where we have leverage as the state to make sure that, as we are investing public dollars, we are creating those public benefits. Others have kind of outlined some examples of what these kinds of job quality and job access measures could look like in our funding mechanisms. You know, wage standards and responsible contractor standards, particularly in the residential or where our clean energy work is in the residential sector. Ideas like aggregating projects to create bigger scale, you know bundling of projects which could then be complemented by project labor or even better yet, community workforce agreements.

On the job access side, setting targeted hiring requirements. You know, we know that contractors -- or it is likely that they will be hiring some new workers to meet

the demand as this work grows. They could be held to targets like of "X percent of new hires," so X percent should come from specified priority populations. Those kinds of targeted hiring mechanisms are very important.

And at the same time, they should be complemented to the extent possible by probably more on sort of within our wheelhouse. But just to say that mentorship and ongoing support for new recruits is hugely important if we want them to stay in the industry. It's one thing to create the pathway and create the sort of demand or requirement for hiring folks who are underrepresented in an industry. If there's no support for them once on a job site though, they may not last very long.

And then lastly one other idea that I'm not sure if folks have mentioned too much, but to some extent we can make better choices, or different choices I should say really, in terms of where we're -- how we're designing our programs and where we're investing our money. You know, a term that folks may have heard of, "the MUSH sector": municipalities, universities, schools and hospitals. Public sector buildings is where there's already a fairly high bar in terms of job quality. And so when we invest in building decarbonization in those public buildings, we better guarantee the sort of labor market outcomes that we seek.

Not to say we should ignore the residential sector, but just again to point out these important differences.

And let me wrap up this section by saying, and I think Sarah alluded to it, that this is the job that I do day to day. I've started what I call the High Road Climate Agency Partnership Initiative here at the Workforce Board where my day job is basically working with the CEC, the PUC, CARB, and anybody else to help basically provide our advice and guidance and direct assistance to address and integrate these kinds of jobs quality and job access measures in funding programs.

And Commissioner Shiroma, I think, was just referencing the Energy Savings Assistance Program where you know, for instance, we had provided some thoughts about how to address wage standards. Which I'm glad to see that the final decision on that program at least leaves the door open to considering that in the future.

But please come to us. This is, again the work that we do is here to support our sister agencies, particularly those involved in energy and transportation, to again make sure that our public investments are setting clear terms and conditions on the labor market outcomes that we seek and we're here to help with that.

I'm getting the time signal, and I know we

already started a little bit late, so unfortunately I'm going to just say a couple of quick words on the training side. But I'm happy to answer questions about our multi-craft pre-apprenticeship program. Again, this is a program that we sort of seeded with Prop 39 money over the last several years. And based on the success of that, we've received money from the gas tax, from Senate Bill 1, that we've started to put out into the field. We also have greenhouse gas reduction fund money that we're using to invest in again, multi-craft pre-apprenticeship.

The training -- I think you'll hear more about it from Julia in a moment -- and again happy to answer any questions about sort of the process and the overall sort of framework of this program.

The only thing I'll leave you with here is, is that we're trying to design -- we are running this in sort of a systematic fashion. This is a program that's trying to connect folks to apprenticeship and other quality construction careers. And it's for construction work writ large. (phonetic) It's not a program for building decarbonization or for renewable energy, it's the construction industry by nature goes from project to project. So to have a solid career in the construction trades this program provides the foundational training that helps people get on to that next step in their career

pathway whether that's apprenticeship or other placement opportunities.

And so we think that this is really again a systematic approach to addressing our workforce needs, whether it's building offshore wind, constructing EV charging infrastructure, or decarbonizing our buildings. It's not sort of task and project or program oriented, it's really industry based.

So I would love to share more about that. I'll provide on the record, after the workshop I'll submit a couple of documents that I think summarize this work and the benefits that we've seen, the impact that this program has had. I'll submit both our workforce guidelines that we created under SB 1. And don't worry about the title, this is again basically 10 standards for multi-craft pre-apprenticeship in California and I'll also provide a link to our final report on the Prop 39 program, because I think both of those documents really lay out again how we did what we did, and why we did it this way. Again trying to make sure that we're addressing long-term career opportunities for disadvantaged workers that supports carbon neutrality. And works within the industry structure that we have.

So I'll wrap it up there. And again based on time I'll just very quickly turn it over to Julia Hatton

with Rising Sun Center for Opportunity.

MS. HATTON: Great. Thank you so much. And a big double click on everything that you just shared, Shrayas.

I'm going to spend most of my time, I think, talking about what Rising Sun does and sort of offering that as a model or models for workforce development in this space. And talking about the best practices and policies that can support these types of models. I'm the CEO at Rising Sun. I have been with the organization for the past nine years and I love what I do. I'm lucky enough to get to say that, so I'm excited to share with you today.

A little background on Rising Sun. We're a nonprofit community-based organization. We've built career pathways for economic equity and climate resilience since 1994. And workforce development is the primary mechanism by which we deliver on our mission. So we have job training and employment programs for both youth and adults in the Bay Area and in San Joaquin County that support individual and community resiliency that combat climate change, and that build economic equity.,

So I'm biased right, but I think there's several things that make Rising Sun special and that kind of make us stand out in the space. One is this triple focus mission at the intersection of workforce, climate, and

equity, right? Everything we're talking about today.

Next is our communities, so we prioritize opportunity youth, for youth who are disconnected from work or school, women, people with insufficient income, and people in reentry or who've been impacted by the criminal justice system. And with that we take a whole person strengths-based approach to working with our participants. So our programs are designed with direct input from those participants, as well as the larger community partners and crucially, employers. If I have slides, we can go to slide 3? Oh, wonderful. Thank you.

So the final thing is that we focus on high-road careers and pathways that offer family-sustaining wages and benefits. And we have specific expertise in the energy efficiency industry, and with the building and construction trades, and emerging expertise in residential building decarbonization and electrification. Next slide.

We run two main workforce development programs: Climate Careers and Opportunity Build. And each uses a different model and serves a different age group.

So, Opportunity Build is a training and placement pre-apprenticeship for adults with barriers to employment, ages 18 and up. And we prepare people for careers in union construction and help them get and then keep those jobs. So this model is about removing barriers, getting people

into jobs that they can live on, and building long-term careers and wealth.

Climate Careers, on the other hand, uses a direct employment model. So it's a social enterprise. We hire and train youth from low-income households, ages 15 to 24. They come on to our payroll. They are our employees and they work as energy specialists in their own local communities.

And this approach is about preparing youth for the world of work through direct paid experience and providing specific industry exposure. It's about building for the future with a first green job. And I'll go into a little bit more detail in the next slide about both programs.

So Climate Careers is our direct employment program for youth. We've been running this for over 20 years, so since 2000. Climate Careers has trained and employed local youth to provide residents with free energy efficiency and water conservation services each year. And we call these green house calls.

So, through this social enterprise model, youth are gaining real-world work experience as energy specialists. They participate in professional development, workshops, and coaching. They fight climate change and then they help impacted residents of their communities save

energy and money.

Our youth are ages 15 to 24. They're all from low-income households. And over these past 20 years about 2,000 of them have made over 50,000 local homes more energy efficient, supporting their own futures and that of our planet. So for many it's their first green job or their first job period. And we're now also starting to offer externships for additional career exposure and experience.

Operationally, we hire about 150 young people across the 10-county region each year. We offer wages of $16 to $18 an hour and our youth can come back each year in positions of greater responsibility. Some become summer managers and actually a fair number actually become Rising Sun permanent staff.

So, again operationally this is expensive and complex. We go from a staff of 25 to a staff of nearly 200 in the summer months. And all things held static, program costs are always rising due to increases in living wage. But from an access and an equity perspective, we think it's important to offer youth a real good-paying job. And studies show that these types of paid positive work experiences early on, or these earn and learn opportunities, build resilience and increase the likelihood of future career success.

I wanted to spend a little time on Climate

Careers, because it has received partial funding from California utility ratepayers, from PG&E through 2006 to 2020. And through BayREN from 2019 to present. Also just to note that we are often asked why we don't become an ESA contractor. Why we haven't become an ESA contractor. And truthfully it's because we can't pay people good wages on that program model. So we've been able to sort of adapt ratepayer dollars through this different model to support good jobs. Next slide.

Opportunity Build, so Opportunity Build is our pre-apprenticeship. We've heard a fair amount about that today. We do use the Multi-Craft Core Curriculum. We've been around offering Opportunity Build since 2009. And since then we've offered a pathway out of poverty for nearly 1,000 people through training for these high-road careers. And Opportunity Build takes a whole person trauma-informed approach to job readiness. And combines 11 weeks of skill development and hands-on training with a year of case management, job placement, and retention support, as well as wrap-around and other supportive services, right.

So, each year adult job seekers, more than half of them women and nearly half in reentry, enroll in our certified Apprenticeship Readiness Program to break these barriers that they faced to employment. They receive a

small stipend during training and then they graduate with their union-approved Multi-Craft Core Curriculum Certification, as well as their First Aid and OSHA 10 certificates, ready to start a career in the building trades construction. Either industries at the forefront of this transition to a clean economy.

I'll mention that we proudly have one of the only all-women MC3 programs in the country, Women Building the Bay, which we run once per year. Next slide.

So Opportunity Build in particular, is an example of how workforce development is about so much more than just the training. I mentioned that it's an 11-week program, so that means that our training lasts for 11 weeks, but during that 11 weeks and for a whole year afterwards, there's case management support barrier removal, job placement, retention support, mental health and substance use disorder counseling, just being there with and alongside our graduates.

It costs $12,000 per person per year to provide this type of comprehensive workforce development programming, and so it is an investment, right? Workforce development is an investment.

And the last thing I'll say is that it's not always that difficult for someone to get a job, it's keeping the job that can be really challenging. And so

that's why things like barrier removal, mental health and this trauma-informed whole person approach is so important. You know, it's about supporting people with the things in their lives that make keeping a job hard, whether it's not having a driver's license or it's not having a place to live right. So that kind of retention support has to be built into workforce development programs. Next slide, please. Thank you.

So some additional best practices and workforce development beyond this whole person comprehensive approach, I'll just sort of list through these. First things first, equity in, equity out, right? Equity has to be the foundation and the center of this work or you're just not going to get equitable outcomes. Part of getting there is by incorporating workers and job seekers into the program design. So to build a strong program you need to build it for what your participants want, not what you think they need. Excuse the garbage truck that's choosing to go by my house at this exact moment.

Employer relationships are also a key part of participatory design. Both Sarah and Shrayas spoke to this, the jobs have to be there. Don't train for training's sake. The training commitment also needs to be commensurate with the career opportunity, and it has to be career advancing. So it does it make sense to have a 100-

hour paid internship? Does it make sense to require five additional days of training for a 100-hour paid internship? Will that extra certificate actually gives someone a better chance of getting a job.

And then there's trust and incentives. I'm short on time so I'm going to cut this a little bit close. Shrayas talked about some of the incentives and then of course metrics. And I will say -- I'm trying to decide what I want to focus on here. Let me speak to a new project that's exciting; if you can go to slide 10, please.

Rising Sun is really excited to be convening a new High Road Training Partnership or HRTP around residential building decarbonization ,alongside union community-based organizations, city government, local agency, research and equity partners.

And our vision is a residential building decarbonization industry that supports quality jobs, engages a qualified workforce, and provides stable career pathways for disadvantaged workers, while simultaneously reducing greenhouse gas emissions and building more resilient communities. So the shorthand is that for us success means that residential decarb jobs will be high road. So our intent with this project, which is just launching this summer, is to address a lot of the questions and issues that you've heard about today. So no pressure

there, we're going to get this all figured out in 22 months.

I will stop there, but I'm excited to dive deeper into any of the things I've touched on in the Q and A.

MR. JATKAR: Thank you so much, Julia. And so yeah, we'll turn it over to Randy Young with the Sheet Metal Workers Union Local 104. Thanks, Randy.

MR. YOUNG: Thank you, and you know my presentation was put together well long before today's event took place. And had I had it to do all over again I probably would have changed some things. Like I probably could have addressed a lot of the questions that were asked earlier in the presentation. But that being said, and for sake of time I'm just going to kind of skim through mine, because I did write down some talking points that I'd like to talk about later if that's okay, if time's permitting. Next slide.

First of all I'm ready Randy Young with the Sheet Metal Workers Union Local 104. I've been in the sheet metal industry for about 32 years. I'm probably the only one on this call that's actually served a state-approved apprenticeship program. And I may be one of the only individuals on the call that actually came from what they would consider a disadvantaged community back in the '80s.

So a lot of this is really important to me, and I

really want to help drive the needle to make the change to help bring in disadvantaged communities and disadvantaged workers. And one of the key focuses that's been brought up today as a residential market, and later on in my slides I got some information that pertains to the cost of low-wage earning jobs. And the study was primarily done in the residential market, so it ties directly to what we're talking about. Next slide, please.

So California's Energy Commission mandate is driven by legislation that's passed on to the Energy Commission. And Senate Bill 1389 requires the Energy Commission to conduct assessments and forecasts of all aspects of energy industry, supply production, transportation, delivery and distribution demand, and prices. The Energy Commission shall use the assessments and forecasts to develop energy policies that conserve resources, protect the environment, ensure energy reliability, enhance the state's economy and protect public health and safety.

California has also enacted a suite of policies building towards achieving an electricity system that has 100 percent zero carbon by 2045, leaving us about 24 years to get that done. Next slide, please.

Workforce training and development is going to require to make significant shifts. Building

decarbonization will involve the shift from fossil fuel technologies to efficient electric solutions. And shift in the workforce that installs and maintains those technologies. The shift will require the existing workforce to learn new technologies and continually adapt their training as the technology continues to advance. The workforce needed to support this must be well versed in new electric technologies, and adapting systems, and technological advancements that will continue to engross the market in the years to come.

Requirements for all-electric new construction will also create immediate significant job losses for construction workers who currently make a living installing gas piping and appliances in buildings. Actions with such significant job loss impacts must be coordinated with concurrent steps to ensure these job losses will be minimized or mitigated.

And I really want to thank the State of California for taking that into consideration, because I think too many times we make changes, create policies, we don't really think about the lost jobs. And now more than ever, social equity has become an important issue. And that's something that everybody should always pay attention to, but I'm really happy to see the Energy Commission is conducting this workshop. And this is a high focus.

Decarbonization efforts must be paired with concurrent step to create high quality energy and water efficiency work to replace lost jobs for existing workers and create new, high quality jobs and career paths. Just Transition requires providing a glide path for workers directly affected by these changes. Creating new low-wage jobs for new workers does not mitigate the loss of a good job paying career for established workers.

Sorry, I lost my place for a minute. The elimination of building gas piping work should be addressed through the concurrent creation of replacement work for those construction workers most directly impacted. Example, through the concurrent adoption of indoor water reuse requirements and to address drought impacts from the climate change.

The gas utility workforce requires a clear plan -- - Again, sorry I lost both my spot on my page. The gas utility workforce requires a clear plan and a reasonable timeline to allow for retention, retirement, and retraining. If we have about 23 years to get this done, we're going to see a lot of the workforce retire out and new guys come in. And we've got challenges on how we're going to get these new guys in and get them trained to the proper levels we need.

The energy savings lost due to the use of

untrained workers is a significant barrier to achieving greenhouse gas reduction goals. A study by the University of California, Berkeley found that the lack of standardized workforce training requirements resulted in poor quality construction and substandard energy efficiency performance. Utility energy efficiency studies have found that less than half of the construction workers installing residential HVAC equipment have been trained in industry standards, leading to "high failure rates for job performance and routine tasks."

The use of an undertrained workforce is also a safety issue. Poor quality construction can result in fire, electrocution, gas leaks, water leaks, mold, sewage leaks and other health and sanitation concerns. I forgot to tell you to advance the slide I'm sorry.

One more as well, so now we kind of take a look at the current workforce as per the 2020 Bureau of Labor Statistics Study. And you can see that we have a similarly aged workforce across most sectors, with the exception of hospitality and leisure. I didn't include those demographics, because I don't really think that they're going to really play into the decarbonization workforce. But I did include coal mining, as well as oil and gas extraction as these industries will be directly affected by the decarbonization of California. And this is an area of

industry that we can look to retrain some of the workers for the new work coming along. I've also included manufacturing and construction. That's two industries that the highest populated workforce.

All industry shown on this chart will be affected by the decarbonization shift. And as you look at that chart, you can see that construction and manufacturing have the highest number of young people coming into the trade or into the industry. But they also have one of the largest populations of individuals working past the age of 64. And that's primarily because a lot of the construction industry is driven by a cost basis and it's low bid on bid day typically gets the award. Next slide, please, when you get there.

We find that almost -- so tying into that we find that almost half of families in construction in California are enrolled in a safety net program at an annual cost of over $3 billion per year, by the residents of the State of California. By comparison, just over a third of all California workforce has a family member enrolled in one or more of the safety net programs. Next slide, please.

Here you can see the breakdown, the number of construction working families enrolled, and adult Medicaid. And again this is just in California from 2015 to 2019. Over 200,000 in Children's Medicaid; 140,000 EITC; TANF

20,000, and SNAP 120,000 with a total of any program enrolled or any participation in these programs, at 330,000 or 48 percent of the construction workforce enrolled in these programs. Next slide, please.

And this slide just shows the cost breakdown of where that money goes and how you come up with a $3.35 billion that the California taxpayers pay for low-wage earning, low-skilled residential workers. And this came from the UC Berkeley Labor studies paper. I wish I would have written down where it came from. Next slide.

So some of our concerns as organized labor, and I think everybody in the industry, we look about the availability or worry about the availability of a qualified workforce. A qualified workforce will need to be available in urban areas and in rural communities, and especially in disadvantaged, hard to reach, and otherwise underserved parts of California.

We have concerns about retraining members from displaced and disrupted workforces. As you can see earlier, the median age of the California construction workers is nearly 43 years old. Other industries likely to be impacted by decarbonization have a similarly aged workforce. And Just Transition must happen concurrently not years after workers lose their job. We are concerned about attracting a younger workforce. And next slide,

please.

And my team has put together some possible policy solutions to alleviate these concerns. Our responsible contractors standards are key to achieving workforce training and development goals. Workforce training and development cannot be achieved when the market incentives project costs over project quality. Contractors will not invest in training and support for disadvantaged worker outreach programs if it will close the barrier to winning bids.

Develop a program level standard that prequalifies installers, especially during early adoption periods to establish a quality standard that consumers can expect. And to incentivize workforce development by manufacturers, installation companies, and partners.

As technologies continue to evolve rapidly manufacturers must be able to feed the latest installation information into established training programs. And we need to establish targets or goals to ensure employment of low-income or difficult-to-employ workers in well-paid living wage or other threshold positions; to establish concurrent equitable Just Transition plans; to address job losses for existing workers.

And some additional concerns, our workforce training and development goals can be effectively achieved

through the support of apprenticeship programs. Apprenticeship programs ensure workers hired by contractors have the skills necessary to construct buildings correctly and safely. Apprenticeship program training curriculum includes specific training on safety and on energy and water efficiency measures. And this training is independent were reviewed and approved by the California Division of Apprenticeship Standards.

And it looks like my time is up, so I will leave it there. But the slides are available for everybody if they would like to review them and thank you very much.

MR. JATKAR: Thanks Randy and Julia again.

So I think, why don't we go to the Commission first. And I can also step in with some questions, but I think it'd be great to hear from the Commissioners first. You may have some questions or comments. I think you're on mute, Commissioner McAllister.

COMMISSIONER MCALLISTER: Sorry, I'm double muted once again. To Shrayas, and Julia, and Randy, thanks so much for your presentation. It's really tremendous work you're all doing, and you know we've intersected reasonably often over the course of all the various work we're doing, and across our building sector. And I just -- you always really stand out -- you and your immediate colleagues really always stand out as leading the way towards where we

need to be in California. And so thanks for the example you set, and the specific work that you do.

I wanted to actually encourage you Shrayas, to sort of have a dialogue, because I feel like there's so many things we could talk about. And I guess I wanted to sort of make sure we cover the most important things that need to happen and what we as the state can do to encourage these kinds of standards. I think you know, the responsible contractor policy is one thing that came up. And you know really focusing on pre-apprenticeship and apprenticeships is another thing. You know, what levers we have to pull, certainly we have contracting at the state. And we have program requirements, I think Shrayas, you brought that up. Are there any other kind of key elements that we should be focusing on there really are not getting the attention or haven't kind of been surfaced sufficiently?

MR. JATKAR: I mean, I'll just start and maybe I'll cue you up, Randy, on this one. And then Julia, you should chime in as well. Which is I think you've hit kind of the big ones like contractor standards and pre-apprenticeship. And I think a few people have spoken to this. From the industry, from you know state agencies, from the utilities, as the workforce system learns about new technology and new skill needs, being able to share

that information with us. And whether or not it makes sense to develop new certifications or other types of credentials, is another way to help support this industry. And I just share that as an example of sort of a different flow of information.

So you know I think, Randy, if you want to jump in with any examples. Or I know some of the -- I think it was maybe Philip who spoke about in the previous session, some specific examples. But that's also a really important kind of partnership opportunity, as folks who are out there in the field doing this work or responsible for getting the work done, as you hear about sort of needs to the workforce system might be able to address, sharing that information would be really helpful.

MR. YOUNG: Well, I'll take a stab at it and I did have something that that Philip mentioned that I wanted to comment on, so it kind of ties into it, the reactive versus proactive.

In the unionized sector, he's right it used to be that way 50 years ago we were reactive. We weren't proactive. We didn't look for the new emerging technology that's coming down the pipe, and train to it, because there was a problem. You train to the technology that you hear is coming, and then it never comes. So then you train all these individuals for this technology that never hits.

That never hit or to fruition, but we've learned from our mistakes and we look at these new trends of new technologies coming down the pipe to train to. In the event they do come, we want to be ready, because we've been caught flat-footed before. And it's cost not only membership, but it's cost the industry advancements moving forward.

So looking at new emerging technologies and new processes that come down the pipe, the sheet metal workers for one are at the forefront of looking at what's coming in and trying to adjust to it, adapt and create the training to do it.

Another benefit that we have is standardized training, so our international overseas putting the curriculum together for the entire United States. And it's not all the same. I mean all the needs aren't the same throughout the United States, but the curriculum available is consistent. So for example, it used to be nuclear energy. We used to train how to do nuclear decontamination and other processes at nuclear plants. Those got phased out, so we had to train to different processes.

One thing that we are really moving into right now is the indoor air quality. And that's been something that we've learned from the pandemic and we've helped create AB 841. And it's not new to us, but it's new to the

industry -- the testing requirements and the assessments, building assessments, to make sure that these buildings are operating properly. So we got in front of that prior to the pandemic. We were already doing it, so we looked at that as an opportunity to help move the industry forward. And make sure that everybody was trained adequately to that level.

And as far as partnerships, Julia is right on. I believe we partner with Rising Sun down in San Joaquin from our Stockton office, but here in Sacramento and in the Bay Area we cover, 49 counties and each area has a Rising Sun or somebody like Rising Sun that we've partnered with that is deep rooted in these disadvantaged communities. And gives us an opportunity to bring in these people from these disadvantaged areas, because if you look at the labor force -- and it's not just in the unionized sector -- we're stale, pale, and we're male. And we can't relate to the same individuals in these disadvantaged communities all the time, so it's important for us to make those partnerships to link bringing those individuals in.

And another connecting point to it, is you have to have the jobs to put these to. You can't in the unionized sector, you can't bring people in and promise them jobs, because of the high cost of labor and the benefits associated with the unionized sector. So you have

to have jobs to be able to put them on to and that's where we've been successful with like SMUD, the Sacramento Kings Arena, Department of General Services, the City of Sacramento with community workforce training agreements, which ties direct requirements to the disadvantaged workers and the disadvantaged communities. Is you get them into the workforce, and not just provide them a job, but provide them adequate training and a career that's going to sustain them for the next 25-30 years. And in many cases take them off that public assistance that they've been relying on for so many years.

I hope that answers your question in a long way.

MR. JATKAR: Thank you, Julia do you want to -- go ahead.

MS. HATTON: Yeah. I mean, I think the two things that are coming to mind are -- and I'm not sure, I think I'm answering your question, or at least partially. But two things that come to mind are the incentives, which I believe others have spoken to. And just really taking a look and making sure that the incentives we have in place or the program structures we have in place are creating the results that we want.

And I think I saw on a previous agenda, that you already talked about cost effectiveness in energy efficiency programs. And I'm a broken record on that. I

could I could talk about that for a really long time, but that is currently set up to disincentive job quality. So no matter how much policy you put in place around like we want you to hire disadvantaged workers. Or we want to see good jobs come out of this. That can't happen if these cost effectiveness calculations are working the way they are today. It just won't happen.

And the other thing that I think about in terms of where do we need to focus more attention, is the residential sector. I think this is just a huge question mark and for all of the reasons that people have already spoken to. You know, the commercial and industrial public sector have union representation, have union coverage and that's why the jobs are good. But it's really difficult to get that same kind of job quality and coverage in the residential sector. And yet that's where we're putting so much investment and putting so much -- yes, so many of these programs, these decarb electrification programs, are in the residential sector, EV, solar, whatever it is. That's largely not a unionized sector and that's where the job quality tends to be poor. It's also where the margins are really challenging for small businesses. So I think we need to really, really look at the incentives there, so that businesses can be successful. And they can offer the quality jobs and the labor standards that we need.

Right now someone can go to get a job at In-and-Out Burger for 19 or 19.50 an hour are you going to do that or are you going to earn like 17 an hour and have to get down into a crawl space or up on a roof, right? In-and-Out looks pretty good in that scenario.

So the incentives there to me or not are not lining up appropriately.

COMMISSIONER MCALLISTER: Great. Thank you so much, Shrayas for that and Julia and Randy both.

Okay. I wanted to give Commissioner Shiroma the opportunity to ask a question, but first I want to make a point, a comment.

So Philip always, he's been doing this research, for you know 15 years or something and really always is very data rich and has a lot of provocative things to say, very insightful things to say. So I would encourage everyone to look at the report that he mentioned, which was done under the auspices of the Energy Futures Institute and sponsored by NASEO, including the State of California, the National Association of State Energy Officials.

So it really is a national look. Lots of longitudinal data, really good stuff about the evolution of the energy workforce. And it makes a few points. I think Phil would probably acknowledge that it's a little bit difficult to sort of look at the labor and non-labor issue

through the data that they gather, but I think they do have some insight about that.

But they also have some insight about the diversity of the energy workforce broadly defined. I'm not just talking about green energy workforce, but it actually is sort of more diverse than you might think already in terms of race and ethnicity. It certainly is not as balanced as it needs to be in terms of gender. And so I think there's a there's a lot of good data there to pour over and really helpful for California.

Last year the state, the PUC and the Energy Commission co-funded a California-specific deliverable that was sort of a subset within that overall nationwide work. And that was that was very helpful to kind of get a better handle on the workforce here in California, so I'd encourage everybody to look at that.

And it looks like the Department of Energy is going to take that back over and sponsor it directly again. The previous administration sort of disowned it. And so the states had to step in and take that on and fund it, which we all did. But I think better if it's sort of in-house at the Department of Energy and has that long-term institutional commitment. So hopefully that report will continue to do what it does, year after year within the Department of Energy. So just FYI, a great resource for

all of us in this discussion.

With that, Commissioner Shiroma, I wanted to invite you to ask any questions you might have, thanks. Thanks for sticking it out for the day.

COMMISSIONER SHIROMA: Thank you. And I know Heather is cautioning us that we're running short on time.

Okay, so really this is not so much a question but rather an acknowledgement that for the CPUC, we have viewed ourselves as the regulator of safety of rates, you're providing for discount programs and what have you. And our focus hasn't been so much on economic development, although the folks we regulate are very key drivers in the Gross Domestic Product of the economic vitality and these economic engines.

So I appreciate the recommendations of Randy.

Julia, your continuing insight on what happens with those wages, and they are key in attracting people to go into this line of work. I think what it means is that we will need to work with the Labor Workforce Development Agency, my former agency, back when I was at the Ag Labor License Board.

But to work with you in terms of how do we figure this out, when it has not been substantially within our wheelhouse in terms of the wages themselves. And how do we work together with the Department of Industrial Relations,

with the workforce investment boards, and so forth. In not only crafting a policy, but also assuring that we are within our legal frameworks. And I'm sure that we can accomplish that synergy to figure all that out.

In the end the customers indeed, are supporting these efforts. Yes, and supporting them for a long time and I think that there is a economic benefit in the end for the workforce, the investments and so forth. So it's just more of a comment saying more work to follow, and I do thank you all for your very valuable insights.

MR. JATKAR: Thank you, Commissioner. And again this is in some ways our work is most advanced with you all at the PUC, where we have an MOU in place and have been working sort of going program by program. And looking at the program and what the industries and occupations are and what are the sort of interventions that might be needed or useful. So I'm happy to share more with you directly about that work at some point.

EXECUTIVE DIRECTOR CHERNOW: Yeah, now I'll just you know add to that. In addition to the training is the need for the continued support once people enter that field.

So for CAEATFA's Energy Efficiency Program, we have a company on contract that provides continued support for our contractors who are often local and small business.

You know, try to make it a program that is easy for them to access, easy for them to grow into, and easy for them to stay engaged with as part of their overall portfolio as a contractor. So I would love for somebody to come and touch on the need for continued support for people as they enter into these fields.

MR. JATKAR: Well, and actually I think at least on the worker side, maybe not so much on the contractor side -- and I think Julia, you could probably speak to this. Rising Sun and many of our grantees have created an alumni network of folks who have completed pre-apprenticeship, which helps build that kind of at least one level of support for folks. Which I think is you're noting you know is key to retaining, retention.

Julia, do you want to say anything about that?

MS. HATTON: Yeah, so this is about the network of alumni or graduates that we have in our program and how we do that or?

MR. JATKAR: Yeah, I think that would be good.

MS. HATTON: Yeah, I mean to be honest this is the hardest part of the work is keeping in touch with folks after they've left the program. And after they've successfully gotten a job, right? So we do certainly have folks who come back and who will talk to our current cohorts and sort of provide that model, of like this is

what it looks like to be in a career and succeed in the career. And like stay with it, reach out to me if you need me for stuff. We collect wage, placement, and retention data at 3, 6, 9 and 12 months. And offer an incentive to folks to provide pay stubs, but of course that's challenging.

And so I think 1) it's about building a relationship with our program participants while they're with us every day. And having that be an authentic relationship and then also thinking about ways to -- you know, what can we offer that they really need that will keep them engaged? And not just going to stay engage with us for the heck of it right? We need to really be providing something of value. So we actually have a project that's looking at that that very question right now.

And then I guess the other thing we do to engage folks is we have program participants who sit on our Board of Directors. And so we're always constantly getting that type of input into our programs, and work strategy overall.

I'm not sure if that answers your question.

EXECUTIVE DIRECTOR CHERNOW: Yeah. Thank you very much.

MR. JATKAR: Are there other questions from Commissioners? No?

COMMISSIONER MCALLISTER: There's a lot to talk about here, but I just want to acknowledge that we are pretty much at the end of our time. And we wanted to ask Heather and Dorothy if we do have any public comment lined up that will dictate kind of how we move on at the moment. Yeah, go ahead, Heather.

MS. RAITT: So this Heather, so far we don't have any public comment. We do have a couple of Zoom Q&A discussion items that we could quickly do if you'd like.

COMMISSIONER MCALLISTER: Oh yeah let's move through that.

So Shrayas, Julia, and Randy, thanks so much for this panel. You were a few but mighty, so thank you very much for a lot of content. There's so much more we need to talk about going forward and I certainly hope you and the rest our panelists today can keep engaged in the IEPR as we develop the report, and make recommendations. And really try to keep highlighting and surfacing and digging into these really large structural issues about how we organize our policy and our programs. And how we resource them I think critically in practice, on the ground in a targeted way. To really move the needle on improving the options for our workforce and the quality of the jobs that come up as we transition to a zero carbon economy.

So thank you so, so much.

MR. YOUNG: Thank you all.

MS. CHEW: Hi. This is Kristy Chew with the Zoom Q&A questions. There are more comments but I thought maybe the panelists with their expertise might want to provide some thoughts on it. So the first question/comment is from Diane Schrader about apprenticeships.

"They are a critical component to skills training. It would be fantastic to see a program that pays contractors to provide on-the-job apprenticeships."

So I was just wondering if there's anybody on the panel that wants to talk about paid apprenticeships and maybe where people can go for assistance if that's what your program has.

MR. YOUNG: I can speak to that a little bit. We don't pay our contractors for apprenticeship, but they also don't have to pay for training. So the training with the unionized sector is based on cents per hour for every person that works in our industry that's organized. They pay a certain -- in Sacramento it's a buck 15 an hour, so that covers the entire cost of training.

So I'm kind of lost as to why we would want to pay the employer to train his workforce or her workforce to do their work, so that the employer can make a profit. I'm kind of lost on that, but I hope that helps a little bit.

MS. CHEW: I think that does.

MR. JATKAR: Maybe I'll add to that sort of along the same lines that I think the trick here is actually to get the employers to invest in their workforce. And that's really what's so unique about apprenticeship, and not all apprenticeships, but in the construction trades most are joint labor management apprenticeships where the contractors are paying into this, because they get something out of it. Apprentices are not paid at the same rate as journey level workers and so there's actually -- I don't want to misconstrue things here, but there is a benefit to the employer paying an apprentice, right? That you're not paying a journey level worker, so that's the incentive.

And so I think along the same lines as Randy, I think that is what apprenticeship is. And so sort of scratching my head a little bit for anything more there, but if it -- because I didn't get to say it earlier, I would just add that because apprenticeship is a job and not just training, it is earn while you learn, that it is unlike community college.

If we don't create the demand for the use or utilization of apprentices through things like adopting the skilled and trained workforce standard. Or just saying you know our school energy efficiency program is public works and should be utilizing apprentices, then we can't feed the

apprenticeship system, which is best in class. Because the doors will only open when the opportunity expands.

So you know what's really limiting here at the Workforce Board for us is not more money to invest in pre-apprenticeship, but more demand for apprentices that creates the demand for the pre-apprentices. We actually have -- I mean, we won't turn down more funding for our pre-apprenticeship program necessarily. But we've grown quite a bit in the last few years, and what we really need is on the demand side to really have clear signals or real signals that there's a demand for the apprentices.

MS. CHEW: Great. A second comment/question comes from Robert Marciel and it's about the workforce, education and training programs in the California investor-owned utilities programs. So he was recommending that, and encouraging that today's participants engage with the IOU workforce, education and training program leads to discuss opportunities for collaboration.

Maybe that's already going on, and maybe you can touch on that just to educate the participants in the workshop. Or if you see that there's room for more collaboration.

MR. YOUNG: I can, maybe touch on that a little bit, because in one of my many hats that I wear, I'm what they call a PRG Member for the IOUs. So I review their

contracts before they're let. And coming from Labor, one of my biggest sticking points is the workforce, education, and training piece. And even though there's mandates that say that you will implore and use it, there are many different training vehicles available.

But all training is not created equal, so these bidders that bid on this work they look for the training opportunities that are going to cost them the least amount of money, but benefit than the most.

So it's a tough nut. And there always seems to be a little bit of reluctance to really put together a thoughtful fruitful workforce, education, and training program for the different bids that go out. Does that help?

MS. CHEW: Thank you.

MS. HATTON: Yeah, and I'll add also -- Robert does incredible work. But I think that when you compare like the WE&T budget to say the mainstream energy efficiency program portfolio budget, there's just no comparison right. The WE&T is a drop in the bucket.

And I don't know that those two -- I don't know, to the extent to which those two programs or departments or initiatives intersect. So if you're an actual, if you're a CBO or an implementer you kind of either apply and work with WE&T, which is like very specific. Or you try to get

into the contracting process with the energy efficiency portfolio. And the two don't really -- at least from my experience -- don't really line up and talk to each other.

And also the opportunities are not balanced, so that's what my experience has been on that specifically.

MS. CHEW: Thank you both for providing the broader picture. It helped. There's so many facets in this it really helps understand all the pieces, so thank you.

I think that's it for question and answer from Zoom.

MS. RAITT: Great, Commissioner if it's okay, we'll turn to Dorothy Murimi from the Public Advisor's Office to see if anybody from the public would like to make comments.

COMMISSIONER MCALLISTER: Please, thank you very much.

Dorothy?

MS. MURIMI: Thank you, Commissioner McAllister, and thanks Heather. I'll go over instructions before we begin. So one person per organization may comment and comments are limited to three minutes per speaker. If there are several parties interested in commenting we will reduce the time to one-and-a-half minutes per speaker.

If you're using the Zoom online platform, use the

raise hand feature. It looks like a high five. Use that to let us know you'd like to make a comment. We'll call on you and open your line to make comments.

For those of you on the phone, dial *9 to raise your hand and then *6 to unmute on your end. And we'll unmute on our end.

So first I'll call on folks on Zoom. Again, that's if you want to make a comment use the raised hand feature that looks like a high five at the bottom of your screen.

And if you're on the phone line dial *9.

We'll give that a moment.

(No audible response.)

MS. MURIMI: I see no public comments. I'll hand the mic back to you, Commission McAllister.

COMMISSIONER MCALLISTER: Great. Thank you, Dorothy. I really appreciate that.

Well, it seems we are coming to the end of our two days of workshops. Really, I think if you've been listening your head is kind of spinning, because of so much content. And on the one hand it is incredibly exciting, because these are issues that we know are front and center where it's amazing to live in a state where we are being challenged to solve these problems. And encouraged and empowered really to solve these problems, but it's a great

responsibility as well.

All of those, all of our -- and myself certainly and all of my colleagues across the Energy Commission, PUC, the Air Resources Board, the Treasurer's Office, everyone, the housing agencies I think really feel the weight of history on our shoulders here. These are these are problems in large measure that have been with us for a while and now we really just have to solve them. We have to get through these conversations and that's bringing a lot of creativity to the table.

And I think we've heard that today in spades. Yesterday, as well, and really across the board in the IEPR process. So Heather and team, thank you again for doing a great job organizing these workshops. I want to give a big shout out to the Efficiency Division for the decarbonization discussions.

I also want to acknowledge the Assessments Division and our Research and Development Division as well, because they bring so much to the table. We're really not only across the agencies, we're building bridges across the divisions within the Energy Commission to address some of these long-term, long-standing problems. So I won't try to sum up everything we've heard, because there's just so much content.

But just on process we will be taking comments

and there's the slide up there that they are due July 27. The specific docket, the sub-docket there is shown, 21-IEPR-06 for Building Decarbonization.

And the IEPR development will be taking a draft, developing a draft and then putting it out for public comment. So there will be multiple opportunities for public comment on this and all the other themes that we're developing this IEPR cycle.

So, through the summer and into the fall, we'll really be trying to flesh out the building decarbonization track to be as pragmatic and proactive. And I think positive really sort of forward looking as possible in terms of where we need to go as a state and how that can happen for building decarbonization in support of our energy decarbonization, and reliability, and equity goals. You know, really as we've been saying over and over we have to do all three of those things. It's the energy systems have to be reliable. They have to decarbonize and they have to develop in a way that's equitable and inclusive. So we just can't leave any of those behind.

So with that I think I will pass the microphone to I believe my last remaining colleague on the dais, Commissioner -- oh no, Derek, there you are too. Sorry, I keep -- I have multiple screens here, so I miss people. So I'll pass to Commissioner Shiroma and then to Executive

Director Chernow. And we will wrap up after that.

Commissioner Shiroma?

COMMISSIONER SHIROMA: Thank you. Thank you, Commissioner McAllister, for your leadership again on this effort. And simply put, today's discussion was very insightful and thought provoking. We have a lot to do ahead of us. And I look forward to working with all. Thank you very much to all the panelists and to the staff who supported this effort and to the folks who have tuned in on this.

Thank you, back to you, Commissioner.

COMMISSIONER MCALLISTER: And thank you for you and your team as well. And the PUC is a true partner in developing these themes. And there's so much expertise in your shop as well, and the complementary perspectives make all the difference. So really, thank you as well.

EXECUTIVE DIRECTOR CHERNOW: And I'll just --

COMMISSIONER MCALLISTER: Derek, did you want to wrap this up?

EXECUTIVE DIRECTOR CHERNOW: Yeah, thank you. And I'll just echo and thank you Commissioner McAllister. Thank you to the Energy Commission staff.

I think what we've heard over the last couple days is you know, the need for an all-the-above approach. And we heard a great amount of wonderful information on how

to get there from a very wide array of speakers, each presenting a unique way of approaching decarbonization and energy efficiency.

And part of that all-the-above approach is financing whether it's grants, incentives or in CAEATFA's experience, leveraging private sector dollars to make these things happen.

And you know, in accordance with that all-the-above approach I think -- and I hope folks are walking away with this -- that they see state government working together: the PUC, the Energy Commission, the Treasurer's Office, Workforce Development and working with our federal partners as well to get us to those greenhouse reduction goals.

And it's an exciting time for us. It's challenging, but I'm walking away very positive over the last couple days that we've got a lot of good people in the state making it happen. So thank you very much.

COMMISSIONER MCALLISTER: Thank you for your leadership. Really, as you said, really a keystone piece of making projects happen in the actual world we live in, that's (indiscernible).

So I think the talk about metrics is really interesting, because they do help us link up the world we live in. And the world that we want to go, that we want to

try to create that helps us know if we're getting there. So there is a lot of food for thought around how we can track our progress as well over the couple of days. So, and good luck on your initiatives as well, Derek, really good stuff.

So with that, I think I will have the final mic drop over to Heather to help us wrap it up and tell us what's next, just in case I've missed something and then we can adjourn. So, Heather?

MS. RAITT: Oh, well you're doing great as usual, Commissioner McAllister. I don't have anything to add, but comments are due July 27th. Thanks.

COMMISSIONER MCALLISTER: Okay, well great.

Well, thanks everyone for sticking it out to the bitter end here. And with that we'll call it a day and look forward to everyone's comments. Take care.

(The workshop was adjourned at 1:01 p.m.)

CERTIFICATE OF REPORTER

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

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IN WITNESS WHEREOF, I have hereunto set my hand this 1st day of October, 2021.

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October 1, 2021

MARTHA L. NELSON, CERT**367