

**DOCKETED**

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CALIFORNIA ENERGY COMMISSION

PUBLIC WORKSHOP

In the Matter of: ) Docket No. 19-DECARB-01  
 )  
 )  
 Commissioner Workshop on ) REMOTE COMMISSIONER WORKSHOP  
 Building Decarbonization: ) RE: Building Decarbonization  
 Opportunities and Challenges )  
 of Buildings Sectors )  
 \_\_\_\_\_ )

CALIFORNIA ENERGY COMMISSION (CEC)

CALIFORNIA ENERGY COMMISSION

REMOTE

FRIDAY, MAY 22, 2020

9:30 A.M.

Reported by: E. Hicks

**CALIFORNIA REPORTING, LLC**

229 Napa Street, Rodeo, California 94572 (510) 224-4476

## APPEARANCES

COMMISSIONERS PRESENT:

Commissioner David Hochschild, California Energy Commission  
Commissioner Andrew McAllister, California Energy Commission

CEC STAFF PRESENT:

Jennifer Nelson  
Dorothy Murimi, Public Advisor's Office  
Eddie Rosales  
Tiffany Mateo  
Gabriel Taylor

PRESENTERS:

Aimee Gotway Bailey, Silicon Valley Clean Energy  
Julia Hatton, Rising Sun  
Meghan K. Dewey, PG&E  
Panama Bartholomy, Building Decarbonization Coalition  
Sirindhi Sampath Kumar, California Housing Partnership Corporation  
Katie Wu, Gridworks  
Leah Pertl, Sacramento Municipal Utility District (SMUD)  
Cathy Higgins, New Buildings Institute  
Chris Malotte Southern California Edison  
Ryan Mazelli, Ygrene

PUBLIC COMMENT:

John Norwood, California Pool & Spa  
Lauren Cullum  
George Nesbitt  
Jan Dietrick  
Pierre Delforge  
Charles Cormany  
Tom Conlon  
Becky Melton

## INDEX

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	Page
1. Call to Order	4
2. Single-Family Buildings Sector Panel	20
3. Multifamily Buildings Sector Panel	84
4. Public Comments	127
4. Commercial Buildings Sector Panel	133
5. Public Comments	176
6. Adjournment	197

Reporter's Certificate

Transcriber's Certificate

1

## P R O C E E D I N G S

1  
2 MAY 22, 2020

9:33 A.M.

3 MS. NELSON: Good morning and welcome. I am Jennifer  
4 Nelson, a manager in the California Energy Commission  
5 Efficiency Division.

6 Today, the California Energy Commission is holding a  
7 Commissioner Workshop on Opportunities and Challenges to  
8 Decarbonizing Residential, Multifamily, and Commercial  
9 Buildings. This workshop, including presentations,  
10 discussions, questions, and any comments will inform the  
11 Building Decarbonization Assessment.

12 Before we hear opening remarks from the  
13 commissioners, I want to cover a few housekeeping items.

14 And if you could go to the next slide, please.

15 Today's workshop on Building Decarbonization:  
16 Opportunities and Challenges of Building Sectors is being  
17 held remotely without a physical location for any  
18 participant, consistent with Executive Orders N-25-20 and  
19 N-29-20 and the recommendations from the California  
20 Department of Public Health to encourage social distancing in  
21 order to slow the spread of COVID-19.

22 The public may participate and/or observe the meeting  
23 consistent with the direction in these Executive Orders.  
24 Instructions for remote participation can be found in the  
25 notice for this meeting and as set forth on the schedule

1 posted to the CEC website. Links to both the notice and  
2 schedule have or will be shortly sent to all attendees via  
3 the chat feature.

4 Next slide.

5 We are using WebEx for today's web conferencing.  
6 Instructions for remote participation can be found in the  
7 notice for this meeting. On the screen are some key  
8 functions in WebEx. Please use these as needed. I want to  
9 bring your attention to two buttons. The mute/un-mute button  
10 is on the far left. Note that all attendees are muted by  
11 default. The Chair, Commissioner, and current panel speakers  
12 and moderator may mute and un-mute during the panel. Audio  
13 lines will be open during the public comment period this  
14 afternoon.

15 The chat button, the button that's looks like a  
16 thought bubble, will allow you to send chats to staff with  
17 questions and comments during the public comment period. We  
18 expect everything will run smoothly, but in case WebEx shuts  
19 down video, we will continue the meeting on the phone line.  
20 If you have called into the meeting or had WebEx call you for  
21 audio, you are connected by phone and should have no issues.  
22 If you are listening via your computer's audio, you may be  
23 disconnected. In this case, the phone number listed in the  
24 notice and on this, at the bottom of this slide will allow  
25 you to reconnect to the meeting.

1           PowerPoints have been posted to the docket for this  
2 proceeding to allow people to follow along and take notes.  
3 We will be taking public comments at two points during the  
4 day, at the end of each panel and again this afternoon after  
5 all panels have been heard. Comments pertaining to the panel  
6 discussion and topic may be submitted via the WebEx chat  
7 feature by emailing Dorothy Murimi from our Public Advisor's  
8 Office and/or emailing Heriberto Rosales, or by calling our  
9 Public Advisor's Office directly. They will relay the  
10 message to Dorothy for her to read aloud.

11           If we do not get to your questions or comments  
12 following the panel, we will save it for the public calling  
13 period. Later this afternoon, we have dedicated time for  
14 public comment. Comments may again be submitted via chat, e-  
15 mail, or calling the Public Advisor's Office for staff to  
16 read aloud. If you want to provide an oral comment, please  
17 use the raise hand function or send a chat or e-mail.  
18 Dorothy will identify your name or the last three digits of  
19 your phone number, and then mute your line. We ask speakers  
20 to limit their comments to three minutes or less, and one per  
21 organization. Comments may also be submitted in writing by  
22 June 8<sup>th</sup>, as described in the notice.

23           Please note we have a court reporter with us today to  
24 make an official record of this workshop. We are also  
25 recording this workshop and will post a file in the next week

1 or so. All presentations, questions, and comments will be a  
2 part of the public record and will be searchable.

3 Next slide.

4 Today's webinar will include panelist presentations  
5 and discussions on the challenges and opportunities to  
6 decarbonizing single-family and multifamily residential  
7 buildings and commercial buildings. The public comment  
8 period is tentatively scheduled to start around 2:30 p.m.  
9 this afternoon. We aim to meet the proposed schedule, but  
10 will also provide flexibility for panel discussion,  
11 questions, and comments.

12 With that, we are ready to move into opening comments  
13 from our Commissioner.

14 Commission McAllister or Chair Hochschild?

15 COMMISSIONER MCALLISTER: I'm not sure. Is Chair  
16 Hochschild on? If not, I'll go ahead. This is Commissioner  
17 McAllister.

18 UNKNOWN SPEAKER: Chair Hochschild should be on.

19 COMMISSIONER MCALLISTER: Oh, I see David. I see  
20 Chair Hochschild on. Maybe I'll just go ahead. Okay, I'll  
21 just kick it off and then the Chair can chime in.

22 So this is Andrew McAllister, Lead Commissioner on  
23 efficiency issues, including AB 3232. Very excited to have  
24 this be kicked off. I want to first of all thank the staff.  
25 Let me ask, actually -- folks who are not speaking to mute

1 their phones so we don't get some feedback and background  
2 noise, which can be kind of distracting. So I really  
3 appreciate you all doing that.

4 I want to thank staff really, Jen and Eddie and all  
5 the folks who are participating today in helping shepherd  
6 this work. This work is critical, really. I want to just  
7 make some opening comments. Usually I say brief opening  
8 comments, and hopefully they'll be relatively brief. But I  
9 think there are a number of important points to make here,  
10 given the importance of this topic. You know, we're now  
11 working in earnest. Staff has really been rolling up their  
12 sleeves and working hard to assemble and deepen the  
13 conversation on this topic and prepare drafts and really vet  
14 their report fully so that we can get it out by the end of  
15 the year, as the deadline and statute asked us to do.

16 This is a bi-divisional effort. You know, the  
17 Efficiency Division and the Energy Assessments Division are  
18 working hand in glove on this topic, and that's notable, I  
19 think, and it's really illustrative or emblematic of the  
20 approach we're taking. You know, buildings are not only --  
21 for many of the reasons we'll talk about today, buildings are  
22 incredibly important for California, for Californians, for  
23 our residents and citizens, for our economy, jobs landscape,  
24 many, many things that we'll touch on today. But they're  
25 also supremely important and increasingly important for our

1 energy systems as a whole -- for reliability on the grid, for  
2 services that they can provide, for flexibility that they can  
3 provide.

4           And that bleeds over into many different areas,  
5 including the forecast and much of the analytical work that  
6 we're doing around the energy system more broadly. And so it  
7 makes all the sense in the world for both of our key  
8 divisions in these respects to be collaborating on this.  
9 Some of you've seen that in the modeling tool that we're  
10 working on, fuel substitution, along those lines as well, to  
11 understand the impact across the energy sector, you know, at  
12 an increasingly, well, at a localized level, at a temporal  
13 level, and then also at different levels of aggregation with  
14 the system. So that's really important.

15           You know, I also want to present a little bit of  
16 context and think about this in a broader way. And AB 3232,  
17 I think, presents us with a great opportunity to link up  
18 multiple themes, some of which I just mentioned, but there  
19 are specific efforts that I'll just list. And you know, just  
20 at the Energy Commission, there are at least seven efforts  
21 that are interrelated and we all, we need to be making sure  
22 to keep those linkages active and live. So obviously, this  
23 Assembly Bill 3232 Building Decarbonization work.

24           We also have Senate Bill 49, which is new authority  
25 for the Energy Commission to incorporate load flexibility

1 into our appliances work. So that's actually really  
2 important. It actually -- and obviously dovetails well, or  
3 should dovetail well with the building decarbonization work,  
4 if we can incorporate demand responsiveness, load flexibility  
5 and bidirectional communication into many of the devices that  
6 go into our building.

7 We have SB 1477, which is looking at promoting  
8 decarbonized heating, largely, heat pumps in both new  
9 construction and the marketplace more broadly.

10 The Title 24 2022 Buildings Standards update. That's  
11 a place where all of these things are also incredibly  
12 relevant. And so again, we need to make sure that those  
13 linkages are being maintained and emphasized and  
14 strengthened.

15 I mentioned the forecasting work. There's a lot of  
16 analytical work that's seeking to characterize how loads  
17 behave going forward, and they're going to behave in new and  
18 interesting ways and they're going to be technology enabled  
19 to do that and so that policy can encourage that. So as we  
20 seek keeping with electrification and different  
21 decarbonization approaches, we're going to need to quantify  
22 that. So the forecasting and all the analytical work in  
23 Energy Assessments Division is really key. So that's five.

24 And then we have load management standards that we're  
25 working hard on at the Commission to encourage, you know,

1 kind of all of the above, in terms of load flexibility in  
2 different ways. That is based on authority that we have at  
3 the Energy Commission. And so that's a, I think, a  
4 foundational effort as well, together with the CPUC, to try  
5 to produce the system benefits from our buildings.

6           And then finally, you know, R&D. We've done a lot of  
7 R&D in these areas and will continue to so do, do more of it  
8 increasingly, from microgrids to different targeted  
9 technologies and decarbonization. There's a lot of  
10 excitement there now and I think that'll also ramp up.  
11 Decarbonization, you know, is a focus of -- and load  
12 flexibility, specifically, will be a continued focus and  
13 enhanced focuses of the R&D effort at the Commission.

14           So that's seven, just right off the top of my head.  
15 That's seven initiatives that are all interrelated and it's  
16 important that they try to rely on similar conversations,  
17 similar narratives, similar standards where applicable and  
18 key coordinated.

19           So that's, if you think of those as trains moving  
20 down kind of roughly parallel tracks, that switchyard could  
21 get kind of crowded. And so it really needs good management  
22 and traffic control to make sure that everything's  
23 coordinated and, you know, and is boxed up, and so that we  
24 have a smooth operation going forward for the next couple or  
25 few years, if we developed all of these initiatives in

1 parallel.

2           So, you know, I think, and then if we layer on the  
3 new relatively related conversations that are coming in maybe  
4 from slightly further fields, like indoor air quality and the  
5 job and recovery of COVID, all of these things, you know, I  
6 think are related in a way that we need to keep in mind. And  
7 you know, the lesson being that close communication across  
8 all of these forms is critical.

9           So, you know, I think, high level we just, we need to  
10 think of buildings as a platform. I've said this before, but  
11 I think it's really, it remains relevant as sort of an  
12 organizing principle. They're a plat -- buildings are a  
13 platform for decarbonization. Most of the technologies that  
14 we're talking about are located in buildings, and that's  
15 where most of us spend most of our time. Certainly, these  
16 days we're all spending a lot of time at home, and so our --  
17 I think we can appreciate in a more visceral way how  
18 buildings really do nurture our quality of life.

19           And even the last couple of days, the Energy  
20 Commission, Commissioner Monahan, posted a series a webinars  
21 on transportation issues. And, you know, even the EV, the  
22 chargers and many of them are located at buildings and need  
23 to be planned alongside upgrades to buildings. And while  
24 that's not strictly part of this work, AB 3232, again,  
25 buildings are our focus and platform for many of the

1 decisions, the investment decisions, that need to be made for  
2 decarbonization. The locational and temporal and all these  
3 types of considerations are intertwined.

4           So, you know, I think to wrap up, I wanted to remind  
5 people actually to have a look, but really to note that  
6 there's quite a bit of continuity here over time and we  
7 really are headed in a forthright way down this  
8 decarbonization road.

9           Remember, the California Energy Efficiency Action  
10 Plan, you know, the update that we approved last year. Seems  
11 like a long time ago since a lot has happened with COVID and  
12 kind of our economy, the shock to our economy and our kind of  
13 normal daily routines. But that was, you know, the last  
14 update of the action plan was reorganized to focus on three  
15 topics, three large broad topics. Doubling of energy  
16 efficiency, which still applies -- I could have added that  
17 maybe as number eight, that's a, you know, big effort under  
18 SB 350.

19           Low income -- you know, equity has to be a focus of  
20 this effort in an integral way, so focusing on low income and  
21 our disadvantaged communities across the state really needs  
22 to be the primary focus of much of our public investment. If  
23 we don't bring along the 35 percent of our population that  
24 just can't do much of what we're asking, or what's needed in  
25 our existing buildings, then we're not going to succeed. And

1 so that has to be a central focus.

2           And then the third focus of the action plan is  
3 building decarbonization, and obviously that's why we're here  
4 today. So I think, you know, keeping this long-term momentum  
5 accelerating and really going is what we can do here today.  
6 All of you who are in the room, it's great to see so much  
7 participation on this webinar. I really want to thank the  
8 panelists and the staff, and the panelists for really giving  
9 us their time and best energy and best effort. And all the  
10 participants and stakeholders and folks who I know are going  
11 to comment and really provide the best ideas to how we can  
12 get there with our, with our implementation of not just this  
13 report, but really making sure that our, that our efforts are  
14 well coordinated and as effective as they possibly can be  
15 across the whole state.

16           So thank you very much. I'm going to leave it there.  
17 I see that Chair Hochschild is now on and invite -- pass the  
18 virtual mic to him for some opening comments as well. So  
19 thanks a lot everybody, and really looking forward to a  
20 productive day.

21           CHAIR HOCHSCHILD: Great. Thank you, Commissioner  
22 McAllister, not just for leading this conversation, but for  
23 your entire career being a champion on this issue.

24           You know, the -- add to what you laid out is where  
25 we're out right now in California is where are emissions

1 coming from our building sector, and come from our entire  
2 fleet of gas power plants in the state, and that imbalance is  
3 going to grow over time as we've been cleaning up the grid.

4           Recently, I announced we'd hit -- this new milestone  
5 is 63 percent carbon-free electricity on the grid today in  
6 California, which is a remarkable feat, we're almost two-  
7 thirds of our retail sales. We're clean and that's, you  
8 know, very good news as the reach of the electric grid  
9 expands further into buildings because water heaters and  
10 (indiscernible).

11           But I remember a few years ago when SB 350 was  
12 adopted in the legislature, and the debate, you know, when  
13 they rolled that out, it was 50 percent clean energy by 2030,  
14 50 percent reduction in petroleum use, and 50 percent  
15 increase in energy efficiency. And, you know, there was, you  
16 know, some believe were contests going at the Energy  
17 Commission level, which of those challenges would be hardest.  
18 And I think the buildings sector actually is the hardest of  
19 those to achieve, but it's absolutely possible, certainly  
20 helped by a lot of the innovation we're seeing in recent  
21 years of these technologies getting cheaper and more  
22 accessible than ever.

23           But I just wanted to highlight what Commissioner  
24 McAllister laid out about the goal of the building sector  
25 being able to support the electric grid. Really, things --

1 so I recently, you know, swapped out my gas water heater and  
2 put in an electric heat pump two years ago. It's working  
3 great. Those kind of devices where you have some flexibility  
4 in the demand grid, that is very valuable to the grid and  
5 gives us more levers, ultimately, to get the intelligent  
6 protocols in place to help support grid reliability.

7 All of us need to be good citizens of the grid  
8 because this is really the sort of spine of our clean energy  
9 structure in California. Our climate solutions really are  
10 flowing largely through the grid, not entirely, but largely.  
11 And of the, you know, California, we get 53 percent of the  
12 venture capital that's deployed in the United States comes to  
13 our state, and most of that is going into the clean -- clean  
14 tech venture capital, most of that's going into -- into  
15 connected to electric grid in one fashion or another. So  
16 this is a really important element of the building  
17 decarbonization strategy, and I think it can have a lot of  
18 benefits for grid reliability, as well as job creation.

19 As Commissioner McAllister noted, our buildings are  
20 more important than ever. Our homes are more important  
21 because we're all working from home. And with the way this  
22 virus has rolled out, there's, you know, you can see  
23 scenarios well maybe it will loosen up as a state and then it  
24 might, you know, get worse and we're suddenly back to work at  
25 home. So it's not at all clear how this will unfold, but I

1 think the prospect of much more work from home is very  
2 likely. Frankly, even when we get to other side of this  
3 virus, you know, I think they'll be some permanent changes in  
4 terms of work from home, making decarbonizing homes more  
5 important now.

6 So my thanks as well to the staff and all the  
7 stakeholders and I look forward to the discussion.

8 MS. NELSON: Great. Thank you, Chair. Thank you,  
9 Commissioner McAllister.

10 So Eddie, if you can go to the next slide.

11 So before we move to our first panel, I want to  
12 briefly offer some context as to why we are here today and  
13 the status of Building Decarbonization Assessment as required  
14 by Assembly Bill 3232 of 2018.

15 As we all know, California has long-term climate  
16 goals to reduce GHG emissions 40 percent below 1990's level  
17 by 2030 and to be carbon neutral by 2045. There is no single  
18 solution to achieve our long-term climate goals. It will  
19 take a coordinated portfolio of activities. This includes  
20 working to double energy efficiency in existing buildings by  
21 2030, providing 100 percent renewable and clean energy by  
22 2045, getting 5 million ZEVs on California highways by 2030,  
23 managing our natural lands to increase carbon storage,  
24 reducing short-lived climate pollutants, and adapting our  
25 state's infrastructure and industry's climate change. The

1 state is also committed to identifying opportunities for our  
2 most vulnerable communities to have increased benefits and  
3 access to clean energy resources.

4 Building decarbonization is a combination of energy  
5 efficiency, demand flexibility, strategies to reduce carbon  
6 intensity of end use equipment and appliances, and deployment  
7 of behind the need or clean energy resources is a key  
8 strategy to reducing GHG emissions and achieving our clean  
9 energy goals. Electrification of end uses in buildings is  
10 one part of this equation.

11 In 2018, the legislature passed and Governor Brown  
12 signed Assembly Bill 3232. This bill directed the CEC to  
13 assess the potential to reduce GHG emissions in residential  
14 and commercial buildings 40 percent by 2030. Technical  
15 feasibility, scenarios, potential strategies, challenges and  
16 opportunities, and costs will be included in this assessment.

17 Since our February 27<sup>th</sup> workshop on the Field  
18 Substitution Scenario Analysis Tool, staff has been gathering  
19 information in data studies and evaluations, evaluating  
20 scenarios and sensitivities, developing fuel substitution  
21 strategies, coordinating with our sister agencies, and  
22 aligning with our other decarbonization efforts. This  
23 includes SB 100, the Load Management Rulemaking, SB 49, SB  
24 1477, the Integrated Energy Policy Reports, and ongoing CEC  
25 research and demonstration efforts.

1 I want to extend my appreciation to the staff of the  
2 Public Utilities Commission, the Air Resources Board, and the  
3 Independent System Operator for working with us as we develop  
4 this assessment. The dialog, coordination, and relationship  
5 is a key factor in offering a quality document.

6 To show where we are going over the next year, the  
7 project timeline is on the screen. We plan to hold two  
8 workshops in June to share results from the Field  
9 Substitution Scenario Analysis. The June 9<sup>th</sup> workshop will  
10 focus on aggregate results. The June 26<sup>th</sup> workshop will focus  
11 on cost effectiveness and technology specific results.

12 We also plan to post a draft report this summer,  
13 which will be followed with a workshop, as well as bring the  
14 proposed assessment to the CEC for reviewing vote in  
15 December. We will continue our work and provide an update on  
16 the assessment in the 2021 IEPR.

17 Public comment periods will be associated with every  
18 workshop and with the draft release. If you have comments  
19 not in line with the specific workshop topic, I encourage you  
20 to still submit your comments.

21 With that, I will move on to the next panel, unless  
22 the commissioners have any additional comments.

23 Hearing none, I will pass it over to Heriberto  
24 Rosales.

25 MR. SAMUELSON: As a reminder, the panelists need to

1 unmute themselves.

2 MR. ROSALES: Good morning. Brian, can you hear me?  
3 Just doing a quick mic check.

4 MR. SAMUELSON: I can hear you now. I just unmuted  
5 you. So I wanted to make sure that they mute or unmute when  
6 they're ready.

7 MR. ROSALES: Good morning everyone. My name is  
8 Eddie Rosales. I'm a staff energy specialist here at the  
9 Energy Commission and I work with Jennifer in the Existing  
10 Buildings Office.

11 And today, for part of the workshop, this is the  
12 first panel, first expert panel of three that we're going to  
13 have today. And we're going to get started with the Single-  
14 Family Building Sector Panel.

15 We have four specialists -- field experts and  
16 specialist here that are going to describe their experience  
17 and work under building decarbonization and/or clean energy.  
18 Let me introduce them by name and title first, and then I --  
19 when they get started with their presentation, I'll offer  
20 more background on their work and some of the work that  
21 they're doing related to building decarbonization.

22 Again, its building decarbonization specific to the  
23 single-family building sector. So this is our first panel.

24 The four panelists we have today on the line are  
25 Aimee Gotway Bailey, director of Decarbonization and Grid

1 Innovation with Silicon Valley Clean Energy, aka, SVCE.

2 Second panelist will be Julie Hatton. She's CEO and  
3 president of Rising Sun.

4 Third panelist is Meghan K. Dewey, manager of Income-  
5 Qualified Programs with PG&E.

6 And our final panelist for -- this panel will be  
7 Panama Bartholomy. He's the director for Building Director  
8 Coalition.

9 Aimee, good morning. Can you hear me?

10 MS. BAILEY: Yes. Can you hear me okay?

11 MR. ROSALES: Yeah. Let me pull up your slides. One  
12 second. Can you see your slides, Aimee?

13 MS. BAILEY: Yes, thank you.

14 MR. ROSALES: Great.

15 MS. BAILEY: All right. Shall I go ahead?

16 MR. ROSALES: One second.

17 MS. BAILEY: Okay.

18 MR. ROSALES: Actually, let me give you the proper  
19 intro to start. Just --

20 MS. BAILEY: Okay, sorry.

21 MR. ROSALES: So I'm going to be the slides for Aimee  
22 today, but Aimee will be presenting on her information. So  
23 let me give a more formal introduction for Aimee.

24 So Aimee Gotway Bailey -- thank you for joining us  
25 today, Aimee -- is the director for Decarbonization and Grid

1 Innovation at Silicon Valley Clean Energy, SVCE. Her work  
2 centers around identifying and managing technical, economic,  
3 and regulatory barriers, and opportunities to achieve deep  
4 decarbonization.

5 Aimee has led the development, adoption, and now the  
6 implementation of SVCE's Decarbonization Strategy and  
7 Programs Roadmap that sets community-side emissions reduction  
8 targets and the strategies and programs for achieving them.  
9 In specific, SVCE's key building decarbonization initiatives  
10 from 2019 including, includes supporting SVCE's 13-member  
11 agencies in adopting all-electric reach codes, providing  
12 small branch to showcase all-electric properties across SVCE  
13 communities through the All-Electric Showcase Awards Program,  
14 and launching a pilot co-funded by the Bay Area Air Quality  
15 Management District, provide rebates for switching from  
16 natural gas to heat pump water heaters.

17 Currently, Aimee is aiding the development of a  
18 building decarbonization joint action plan between SVCE and  
19 our member -- and their member agencies to help set  
20 priorities for 2020 and onward.

21 Thank you, Aimee. With that, you may get started.

22 MS. BAILEY: Great. Thank you very much for the  
23 opportunity to be here and to speak on SVCE's activities in  
24 the building decarb space.

25 But first, I wanted to give a very brief introduction

1 for those of you who aren't familiar with SVCE. We are a  
2 community energy agency, formed and governed by these 13  
3 cities in the Bay Area. So we serve the heart of Silicon  
4 Valley. And our cities formed us to take bold action on  
5 climate change, and that's baked right into our mission  
6 statement, which is to reduce dependence on fossil fuels by  
7 providing carbon-free affordable and reliable electricity and  
8 innovative programs for our community.

9 SVCE started serving customers in 2017, and at the  
10 end of 2018, as Eddie had mentioned, our board adopted the  
11 Decarb Strategy and Programs Roadmap, which really set our  
12 communitywide emissions reductions targets and our priorities  
13 and outlines and approach in strategies for how we're going  
14 to achieve those emissions reductions.

15 So the activities that I'll be speaking about today  
16 are really guided by that policy document. The overarching  
17 approach, in a nutshell, extremely simplified, is to procure  
18 clean electricity, electrify buildings and cars to then use  
19 that clean electricity and promote energy efficiency and  
20 successful grid integration.

21 Next slide, please.

22 So to provide some context on the built environment  
23 at least an SVCE service territory, here is a so-called  
24 Sankey diagram of emissions in buildings. So on the left, it  
25 shows the emissions by fuel source, and this is as measured

1 at the meter. Then it's filtered by sector in the middle,  
2 and then down to end use on the right. So as you can see on  
3 the left, natural gas is responsible for the majority of  
4 emissions in our buildings. The commercial and residential  
5 building sectors are nearly equally responsible. But single-  
6 family homes in specific are really the largest single  
7 sector. And the emissions are primarily going towards space  
8 and water heating, as you can see on the very right. So  
9 hopefully this is a helpful of high level snapshot.

10 Next slide, please.

11 Following our decarbonization approach -- and since  
12 this panel's focused on single-family homes, we did want to  
13 share the way in which we depict a home that's ready for the  
14 future, and we call it the so-called FutureFit Home. So this  
15 graphic illustrates the various components. First, it's all-  
16 electric, then there are a variety of different appliances  
17 called out in the graphic, such as induction cooking, heat  
18 pump heating and cooling, electric dryer, heat pump water  
19 heater, and EV charging, not to mention solar and battery  
20 storage. And all of it's tied together through intelligent  
21 controls.

22 So we found that consumers often think of the '70s  
23 when they think of electric appliances, the coil stove,  
24 electric resistance furnace or water heater, et cetera. So  
25 in the education and marketing outreach materials that we've

1 developed, we really try to combat that preconception by  
2 depicting what it is, which is a modern home, an all-electric  
3 modern home, and distinguishing between these old-timey  
4 appliance types and the modern technologies that we're  
5 talking about.

6           Next slide, please.

7           So that's the kind of vision that we're working  
8 toward on the single-family front. I'll cover briefly those  
9 three building decarb programs that we've been working on  
10 since last year to provide some context, but then the last  
11 slide is really focused on the lessons learned from deploying  
12 these programs.

13           So in 2019, our primary focus has been on new  
14 construction as the most cost-effective and really sensible  
15 time to choose to electrify. So we sponsored the development  
16 of model building codes, or reach codes, to move towards all-  
17 electric buildings, and also more EV charging infrastructure.  
18 So in our service territory, 9 of the 13 member cities have  
19 adopted reach codes, and actually three more are in the  
20 process still of consideration.

21           There is some variation in specific reach codes that  
22 have been adopted. Some ban natural gas, for instance, in  
23 certain buildings types. Others limit it by end use, and  
24 some focuses more -- some focus on encouragement of limiting  
25 natural gas use. But they're all moving in the same

1 direction towards all-electric new construction.

2 And so in this graphic, in this map, the cities with  
3 the asterisks are the ones that have already approved reach  
4 codes. So some of the big ones, for instance, are Cupertino,  
5 Mountain View, Milpitas.

6 Next slide, please.

7 So although our primary focus has been on new  
8 construction as we've started spinning up our program's  
9 portfolio, we also started to pilot programs to help  
10 decarbonize existing buildings. In SVCE service territory,  
11 we are very built out. There isn't a lot of greenfield  
12 development happening, so we have to address existing  
13 buildings to meet our climate targets.

14 To start out, we launched a pilot to provide rebates  
15 to replace natural gas water heaters with heat pump water  
16 heaters and this was a pilot co-funded by the Air District,  
17 and I just wanted to highlight a few features of that  
18 program. In addition to the equipment rebate for the  
19 appliance, we also added an additional incentive to cover  
20 part of an electric service panel upgrade, in recognition  
21 that this was a significant barrier for existing buildings in  
22 switching to electric.

23 And although I forgot to mention that on the slide, I  
24 apologize, we also had a carve out of this program  
25 specifically 10 percent of the systems are reserved for low-

1 income customers. And there is also an additional rebate  
2 amount specifically for heat pump water heaters that  
3 incorporate smart technology, such that we can aggregate them  
4 into a virtual power plant to help with grid integration  
5 purposes. So we're currently extending this program through  
6 the end of the year.

7 Next slide, please.

8 And I realize this is a very brief presentation, but  
9 the last program that we wanted to highlight is specifically  
10 what we're doing in response to COVID. So in response to  
11 COVID, SVCE's board approved 10 million dollars in Customer  
12 Relief and Community Resilience Programs. Part of that is  
13 specifically funding this program, a virtual workforce  
14 development program. So we're working with partners to  
15 develop approximately six hours of web-based training and  
16 content for contractors. And when that's complete, when a  
17 contractor completes the training, then they're eligible for  
18 \$500 in compensation.

19 We're also, on top of that, offering up to 3,000 in  
20 rebate funds if a contractor installs one of the approved  
21 decarbonization technologies at their own home or in the  
22 workplace. And I would just, you know, say one thing. There  
23 are a lot of technical trainings out there, amazing technical  
24 trainings out there from the manufacturers, organized labor,  
25 community colleges, other organizations. However, what we

1 had found is that although they do an amazing job at  
2 addressing the how, like, how do you install these systems,  
3 they don't necessarily address the why. So the focus of this  
4 content is a lot more on that why, like, what are the  
5 underlying drivers for why the market is heading in this  
6 direction? What are the health and safety and economic  
7 benefits? Why are customers asking them for these  
8 technologies? And so that's the key focus here. And then  
9 there's the practical opportunity to get hands-on training.

10           Next slide, please.

11           So to finish up, we've included here a consolidated  
12 list of lessons learned, and it's by no means exhaustive.  
13 And for many of the folks attending this workshop, there's  
14 probably nothing on here that's surprising or new. I'll just  
15 walk through a few of them, though.

16           One of the primary barriers that we've experienced  
17 very much on the single-family side, but also spanning other  
18 sectors is that contractor and consumer education and  
19 awareness of all-electric buildings and heat pump  
20 technologies and building decarbonization pathways, that's a  
21 big barrier. There is this very persistent belief that gas  
22 appliances are the most efficient and even the most  
23 environmentally beneficial, and that is a closed case. So  
24 combating those outdated beliefs has been a struggle.

25           We also have a lot of existing buildings in our

1 service territory that will need panel upgrades and result in  
2 upgrades to their distribution system service. So those are  
3 significant barriers that need to be addressed as well.  
4 Although we have this heat pump water heater pilot that  
5 offers the panel upgrade incentive, we are not in a position  
6 to do that for every single customer that's going to need  
7 one. So there have to be smarter and more efficient  
8 approaches and policies to help tackle that issue.

9 Resilience has also come up as a concern very  
10 regularly during public meetings evaluating reach codes. And  
11 many of those council meetings, at least for our member  
12 agencies, happened to be happening last fall during the  
13 public safety power shutoff events. And there are some, you  
14 know, misconceptions out there about all-electric being less  
15 resilient, that navigating that nuanced conversation and the  
16 emotional response has been challenging.

17 And I would say, just generally speaking, there's a  
18 growing sense from a policy design perspective that we can't  
19 really compartmentalize climate change mitigation measures,  
20 such as electrification from climate change adaptation  
21 measures that will support resilience. So kind of the  
22 current thinking is that concerns about resilience have to be  
23 addressed and communicated from the design stage in order to  
24 continue to make progress on the decarbonization front.

25 And nearly all of these things have a direct

1 relationship to cost, specifically increasing it, which is a  
2 big barrier for -- especially for retro fits in our service  
3 territory. So for instance, for the customers that have  
4 reserved a heat pump water heater program rebate and later  
5 did not complete a project, the number one reason was because  
6 of cost.

7           Although there are significant barriers, there are  
8 certainly opportunities. As has already been mentioned by  
9 the Commissioners, health and safety benefits of all-electric  
10 buildings, they resonate with folks, especially now as we're  
11 spending more time in our homes, and as the virus is a  
12 respiratory-related disease.

13           We've also seen through the reach code effort that  
14 there is an opportunity to create the demand signal that's  
15 needed to give contractors in the private sector greater  
16 certainty, that there's a market for decarbonized buildings,  
17 and that pursuing all-electric will make good business sense  
18 for them.

19           So maybe I'll stop there. I think I'm already past  
20 time. But thank you very much for the opportunity to speak,  
21 and happy to answer any questions.

22           MR. ROSALES: Thank you, Aimee. That was a good  
23 presentation.

24           Julia, can you hear me? Can you give me a thumbs up?  
25 Yay. I learned that trick from my kids' elementary school

1 teacher.

2 Aimee, we will come back to you with questions.

3 We'll get through, and just a reminder to all the  
4 participants on the line, we're going to do is we're going to  
5 go through the presentations with all our panelists, and then  
6 we'll pause for Q&A session. And so there will be  
7 opportunity for everyone to submit and field questions to  
8 both panelists and also the CEC staff.

9 Our next presenter is Julia Hatton. Julia Hatton is  
10 a chief executive office at Rising Sun Center for  
11 Opportunity, a greater Bay Area nonprofit working at the  
12 intersection of the economy, environment, and equity, with a  
13 focus on job training and workforce development.

14 Julia joined Rising Sun in 2012 and directed Rising  
15 Sun programs for over five years before taking on the  
16 organization's policy and strategy work around equity,  
17 climate, and workforce in 2018. Julia acted as one of the  
18 Rising Sun's interim co-executives for six months before  
19 assuming the role of CEO. Congratulations.

20 Over the past 15 years, Julia has worked across the  
21 public, private, and nonprofit sectors focusing on workforce  
22 and economic development and environmental justice.  
23 Immediately prior to Rising Sun, she designed and implemented  
24 a Connecticut Efficiency Healthy Homes Initiative, which  
25 provided energy, health, and safety upgrades to low-income

1 families statewide, while creating green jobs.

2 Julia grew up in Chicago, is an alumni of Coro  
3 Fellowship in Public Affairs. Today, Julia lives with her  
4 family in the East Bay.

5 Welcome Julia, good morning.

6 MS. HATTON: Morning. It's great to see so many  
7 folks participating and I'm really excited to be here. Are  
8 people able to see my screen?

9 MR. ROSALES: We can see it Julia, yeah.

10 MS. HATTON: Okay, great. And so I'm going to start  
11 by saying that I'm not specifically an electrification or  
12 building electrification expert. But what Rising Sun does do  
13 is focus on job training and workforce development, and  
14 community engagement in people. And I would encourage  
15 everyone, if they haven't already, to read through the report  
16 that Greenlining and Energy Efficiency ofr All (EEFA) put out  
17 last year on equitable building electrification and the  
18 framework there.

19 And something that really stood out for me from that  
20 particular report is that to really, you know, build equity  
21 into this conversation from the beginning, the goal that we  
22 should all hold is to focus on building the health and  
23 resilience of people and communities, rather than the goal of  
24 decarbonizing our building stocks. So that's not to say  
25 that, you know, obviously this conversation's about

1 decarbonizing the building stock, but starting with people  
2 first and their needs will lead to more equitable outcomes.

3           So I'm going to share a little bit about Rising Sun  
4 and what we do. I'll move my slides forward. Rising sun has  
5 a mission, we're nonprofit, to empower individuals to achieve  
6 economic and environmental sustainability for themselves and  
7 their communities.

8           I mentioned a little bit about our expertise earlier.  
9 We focus on equity and the idea that economic, environmental,  
10 and social opportunities should be accessible to everyone.  
11 We -- what we do on a day-to-day basis is workforce  
12 development, specifically for low-income adults and youth,  
13 and focusing on preparing them for careers in the clean  
14 economy and construction, the building trades, energy  
15 efficiency, and really making sure that those are high road  
16 opportunities that can lift people out of poverty. We do a  
17 lot of community outreach and engagement, focusing on hard to  
18 reach and hard to serve communities, and disadvantaged  
19 communities as well.

20           We have two primary programs that we run on a daily  
21 basis. Opportunity Build is a workforce development program  
22 that we've been operating since 2009. Opportunity Build is a  
23 pre-apprenticeship, so it prepares individuals for union  
24 apprenticeships and careers in the building trade  
25 specifically. Rising Sun's emphasis is to not just provide

1 that hands-on construction training in math and those harder,  
2 more technical skills, but really to provide a whole person  
3 approach that includes supportive services, case management,  
4 mental health support, substance abuse counseling, so that  
5 we're really offering a pathway out of poverty and working on  
6 barrier removal and things like that.

7 We offer one of the only all-women pre-apprenticeship  
8 training programs in the country. So we serve both men and  
9 women, but about 55 percent of our participants are women,  
10 and we have one cohort that's just for women, and we work a  
11 lot with the reentry population as well. Folks are coming  
12 home from having been incarcerated.

13 Our other program that's been running since 2000 is a  
14 social enterprise where we employ local youth to provide  
15 residential energy efficiency services to local communities.  
16 We do that in ten different counties throughout the Bay Area  
17 and Central Valley, and our objective there is give 150 young  
18 people their first green job or just their first job period  
19 every year. And then also simultaneously help over 3,000  
20 residents save energy. All of the youth in our program come  
21 from low-income families, and the services we offer are free  
22 and are focused on underserved low-income and disadvantaged  
23 communities.

24 This is a picture of our women building the Bay  
25 cohort from last year. A lot of these women are now in the

1 sheet metal workers, carpenters union, and things like that.

2 And this is a picture of one of our youth summer programs.

3 Rising Sun also engages in some policy work. Focus  
4 areas are job quality and job access for disadvantaged  
5 workers, equitable energy and climate program access in  
6 making sure that the benefits are distributed equitably, and  
7 ensuring that environment and social justice communities are  
8 prioritized in climate investments.

9 So for the purposes of this specific conversation,  
10 I'm going to talk about two things, job quality and taking  
11 that into consideration when thinking about decarbonization.  
12 And the second thing I'm going to talk about is community  
13 outreach and engagement.

14 There's a lot here and I'm happy to answer more  
15 questions about it, but these are the types of things on this  
16 slide that Rising Sun talks about when we get asked, what is  
17 a good job, right, and how do you ensure that jobs are  
18 quality jobs. We do focus a lot on the building trades and  
19 unions because all of these things are already built in, but  
20 there are also other high road employers and industries  
21 offering quality employment opportunities for disadvantaged  
22 workers and entry-level folks.

23 So the first thing here always is to start with  
24 equity -- equity in, equity out. We talk about family  
25 sustaining wages. We talk about employer provided benefits,

1 career pathways and advancement opportunities, workplace  
2 safety, worker voice. All of those things are the things we  
3 look for first when we're placing someone into a job after a  
4 training. The idea is to break the cycle of poverty, not put  
5 someone in a job that is just going to keep them in poverty.  
6 Historically, I think there's been some disconnect or some  
7 challenges with making sure that green jobs are quality jobs.  
8 And no one, you know, should have to choose between a good  
9 job and a clean job. So we're really interested in making  
10 sure that these opportunities are high road.

11           There are things that you can do to build in this  
12 kind of job quality. So setting hiring targets, so hiring a  
13 certain number of folks from low-income households,  
14 disadvantaged communities, focusing on workers who have  
15 barriers to employment. Funding, training, and supportive  
16 services, and case management is essential to making sure  
17 that these opportunities are accessible. Project Labor  
18 Agreements are another thing we talk a lot about, Community  
19 Benefit Agreements, Community Workforce Agreements, things  
20 that have labor standards and targeted and local hire  
21 language built in. And then you need accountability, right.  
22 So metrics in tracking are essential in these types of  
23 program design as well.

24           And I just have a bullet here, too, about a just  
25 transition rate. We need to make sure that we respect and,

1 you know, take care of existing fossil fuel workers and  
2 recognize that the wages offered in that industry have been  
3 historically much higher than those offered in the green --  
4 green economy. So we need to make that competitive and we  
5 need to provide training and transition support. And we also  
6 have to support folks who have been historically excluded  
7 from those opportunities and help them get into these new  
8 clean economy jobs.

9           And then the next piece is community engagement. And  
10 I think, you know, the San Joaquin Valley pilots our good  
11 example of how this really works on the ground. But from  
12 Rising Sun's experience reaching out to residents for energy  
13 efficiency services, these are the types of things that we've  
14 tried to incorporate into our work to make sure that our  
15 programs are reaching the people that we want to, who need  
16 the services most, who are hit first and worst by climate  
17 change, and who bear a higher energy burden. Again, start  
18 with equity.

19           Participatory design and community-led decision  
20 making is essential. And I think particularly when you're  
21 talking about building decarbonization and electrification,  
22 it's important to consider community and individuals' rights  
23 to self-determination.

24           Trust is essential, so community-based organizations  
25 can provide that trust and partnership. ESJ is Environmental

1 and Social Justice Communities, so prioritizing those  
2 communities and targeting your outreach to those communities  
3 is crucial. In-language outreach and services is another  
4 way. And then it's really important to make it easy to  
5 participate, right. It's really, you know, we go into  
6 thousands of homes every year -- not this year, obviously --  
7 and it's really remarkable how difficult it is to offer even  
8 a free service, right. So you have to make it as easy as  
9 possible for people to participate.

10           Offering programs and services that are no- and low-  
11 cost, minimizing the paperwork and documentation that's  
12 required, and then coordinating and leveraging other  
13 programs. There's a lot of confusion in the market about all  
14 these different programs and they don't always fit together  
15 nicely.

16           This is where you can find Rising Sun, our  
17 headquarters. We have a building in Oakland and an office in  
18 Stockton. We operate primarily in the nine Bay Area counties  
19 and San Joaquin County. And if anyone has any follow-up  
20 questions, this is where you can find us.

21           MR. ROSALES: Thank you, Julia. Is that the end of  
22 your presentation?

23           MS. HATTON: Yes.

24           MR. ROSALES: Great. Thank you. Thank you. And we  
25 really appreciate your points. I think they go to

1 Commissioner McAllister's remarks about the challenge in  
2 front of us for decarbonizing California's buildings across  
3 the state. Obviously, it's a large state. We got millions  
4 and millions of residential buildings to consider. Both  
5 existing, and new, and obviously a big portion of the state  
6 throughout the entire state -- throughout all of the counties  
7 are low-income -- there's going to be low-income barriers in  
8 every county.

9           So thank you for -- for sort of giving us insight in  
10 how difficult and some of the considerations we need to take  
11 when you're considering working with those communities.

12           We're going to go -- we're going to proceed with our  
13 third panelist.

14           Meghan, are you on the line? Can you hear me? I  
15 think you're muted. Can you unmute yourself? You're -- I  
16 don't think your audio is on yet. There you go. Now you  
17 need to get --

18           MS. DEWEY: Can you hear me?

19           MR. ROSALES: I can hear you. Yeah, you came on.  
20 Thank you.

21           MS. DEWEY: Okay. I called in from my phone because  
22 when I originally called in from my computer, I think there  
23 was an echo.

24           MR. ROSALES: Okay.

25           MS. DEWEY: Is there an echo now?

1 MR. ROSALES: A little bit, but it's okay.

2 MS. DEWEY: Oh, okay. I'm sorry, guys.

3 MR. ROSALES: It's okay.

4 MS. DEWEY: When I switched to my phone, I don't  
5 think it translated to my name. So I figured I would have  
6 technical difficulties.

7 So Eddie, I'm going to let you run my slides, so I  
8 don't mess that up.

9 MR. ROSALES: One second. Sure.

10 MS. DEWEY: If you don't mind.

11 MR. ROSALES: I don't mind.

12 MS. DEWEY: Thank you.

13 MR. ROSALES: Pulling them up. So let me -- let me  
14 introduce Meghan for the audience here.

15 So Meghan Dewey works at PG&E, has held numerous  
16 leadership positions focused on improving customer experience  
17 and meeting the demands of our -- of customers fast evolving  
18 energy.

19 Currently Meghan oversees PG&E's San Joaquin Valley  
20 disadvantaged community electrification pilots. In addition  
21 to leading the company's strategy and policy efforts for the  
22 Energy Savings and Assistance Program, ESAP, prior to this  
23 role, Meghan led PG&E's Energy Efficiency Program Portfolio  
24 and it is -- its EE Policy and Strategy -- and its EE Policy  
25 and Strategy and Issues. Excuse me.

1 Well good morning, Meghan. I will start slides. Let  
2 me --

3 MS. DEWEY: Thank you. While Eddie's getting those  
4 slides up, thanks again for having me. I'm really excited to  
5 be part of this esteemed panel. It will be a really  
6 interesting conversation.

7 And today I'm here to talk a little bit about both  
8 our -- I'll call our early adopters and market rate  
9 customers, as well as our -- some of the equity and low-  
10 income projects that we have going on. Really, and how our  
11 position has been formed over the last ten years by the  
12 research and studies and projects that we've supported to  
13 help us better understand the benefits of all-electric homes  
14 for all of our customers, as well as for our company.

15 MR. ROSALES: Hey, Meghan. This is Eddie. Can you  
16 see your slides?

17 MS. DEWEY: I cannot. Can anyone else?

18 MR. BARTHOLOMY: I'm not seeing the slides yet. Are  
19 you sharing your screen?

20 MS. DEWEY: Oh, I think it's starting. There we go.  
21 Okay. So you can move on to the next slide already.

22 So real quickly, as you all know, in July 2019,  
23 Berkeley became the first city in the nation to require that  
24 new buildings be built all-electric. And at that meeting,  
25 PG&E became the first dual-fuel utility in the nation to

1 support a local government's push towards all-electric new  
2 construction. So we're really proud of ourselves in that  
3 perspective.

4 Next slide.

5 So really since mid-2019, PG&E has stepped up our  
6 support for local jurisdictions pursuing Reach Codes and  
7 helping our customers and the state of California realize our  
8 climate and clean energy goals. And generally speaking, we  
9 certainly support our -- the decarbonization objectives, as  
10 we're talking about today.

11 And so while we continue to support, this move  
12 towards electrification, one of the things that we also are  
13 very conscious of is trying to avoid any new investments in  
14 our gas assets that might later be proved underutilized. And  
15 then we certainly want to ensure that we're mitigating  
16 cautious to those gas customers that remain.

17 But while our position on electrification may have  
18 seemed surprising or sudden to some, it really was a result  
19 of years, decades of experiences in demonstrating the  
20 feasibility and the cost effectiveness of all-electric new  
21 homes, and really those benefits to our customers.

22 Next slide.

23 So again, we've spent over a decade really studying  
24 this -- the opportunity that mostly electric and all-electric  
25 can offer our customers. And through these projects we've

1 really learned that all-electric homes can offer lower bills,  
2 certainly more -- better indoor air comfort, and better air  
3 quality for our customers and our communities.

4           And in particular, the DeYoung Property ZNE  
5 demonstration projects, this story is particularly  
6 compelling. This production builder embraced the idea of --  
7 of mostly electric via ZNE early on. And they were really  
8 instrumental in showcasing that mostly all-electric was cost  
9 effective and feasible.

10           The focus now for us is to continue our support and  
11 research -- and research on what -- how do we really move to  
12 a truly all-electric home? And so part of this, we're  
13 testing and evaluating evolving high performance heat-pump  
14 technologies through a couple different venues, including our  
15 Central Valley Research Homes. Also at our Applied  
16 Technology Services, ATS, lab in San Ramon, among others.  
17 And so we think that these projects should really help us get  
18 to that next generation of all-electric homes.

19           Also, and this will be a feature of the conversation  
20 later today, multifamily buildings are really the next  
21 frontier for us. We see as large heat pump water heating  
22 systems emerge to support all-electric designs, we want to  
23 invest in performance testing at our lab that I mentioned and  
24 through other demonstrations including one at Davis actually,  
25 that focuses on load shifting.

1           Next slide.

2           So now we're pretty confident that builders are ready  
3 and willing to build all-electric. In fact, findings from my  
4 colleague's organization, the Building Decarbonation  
5 Coalition Stakeholder Assessment of All-electric Residential  
6 New Construction supports this. I believe that they found  
7 that 88 percent of builders are actually interested in  
8 building all-electric homes.

9           But much like my other colleague Aimee suggested,  
10 we're not fully there with customers yet. We funded, in  
11 2018, an internal research project to explore our customer's  
12 perceptions with their electric and gas usage. And what we  
13 found were that -- was that generally our residential  
14 customers believed that electricity is safer and healthier,  
15 and it gives them actually more control over their energy use  
16 than gas. However, they're still really wedded to gas  
17 cooking and gas fireplaces. I don't think that's any  
18 surprise to any of us. You know, as sexy as induction  
19 cooking can, we sometimes think it is, most of them are not  
20 lured by that yet.

21           However, we did find that customers were less -- less  
22 resistant to how their water is heated and how their space is  
23 conditioned. And so I think that's promising, in particular,  
24 for some of that heat pump technology.

25           And so for us at PG&E, since we don't want to build

1 out mostly-electric homes if we're trying to avoid that new  
2 gas infrastructure, it's really in our best interest to  
3 figure out how to move our customers towards these all-  
4 electric choices for new construction. And I know SMUD, and  
5 SVCE (Silicon Valley Clean Energy), they've done some really  
6 great work in educating our customers on all-electric  
7 choices, in particular for induction cooking. And we of  
8 course have our ZNE demonstration home at the Stockton  
9 Training Center to help showcase all-electric opportunities  
10 for both our customers and builders.

11 I think we have more work to do. And my challenge  
12 for my behavioral scientist colleagues, I believe that  
13 Charlie Buck from Opower might be on the line. And if he is,  
14 he will remember my favorite thing to do is give people  
15 homework after workshops like this. And so my homework to  
16 you behavioral scientists and others out there is how do we  
17 get our customers to move towards these all-electric choices?

18 You know, if I reflect on the great work that Opower  
19 did from a behavioral perspective in energy efficiency with  
20 their home energy report, that almost revolutionized a lot of  
21 the things that we were doing in energy efficiency. And so  
22 again, my challenge is to you is how do you make that happen  
23 for our work here in decarbonization?

24 Next slide.

25 So now I'm going to transition to talking about two

1 real life examples that are helping us learn about the  
2 opportunities and challenges for electrification for our  
3 residential customers. So the first I'll focus on is our  
4 Advanced Energy Rebuild. And that is a new construction  
5 program that's focused on what I'll -- what I'll call our  
6 market rate customers. And then the second one is the San  
7 Juaquin Disadvantaged Communities Electrification Pilots.  
8 And that's a retrofit pilot or program that's focused on our  
9 low-income customers.

10           So first, Advanced Energy Rebuild. This was a  
11 program that we collaborated with Sonoma Clean Power and the  
12 Bay Area Air Quality Management District to create this  
13 program. And it was designed to help homeowners after the  
14 devastating 2017 wildfires rebuild new, more efficient homes  
15 focused on reducing their GHG emissions.

16           The program officially launched in 2018 and it  
17 layered funding from those three organizations. And it  
18 provided incentives for both dual fuel and all-electric. And  
19 so the customers that chose the all-electric path were  
20 offered an incentive of 12,500. And then those who chose the  
21 dual-fuel option were offered 750 -- I'm sorry, 7,500.

22           The great news is that those customers who were  
23 presented with a choice, as of April 2020, 30 percent chose  
24 the all-electric path in a community coffee park that was  
25 formerly dual fuel or is dual fuel.

1 I would say the more challenging news is that only 30  
2 percent of those customers chose that all-electric path. And  
3 for us, why we think Advance Energy Rebuild really represents  
4 that great opportunity to test electrification, because we  
5 consider these more of early adopters, and we want to get  
6 these numbers up. We believe these are the customers that  
7 are going to be able to help us really understand how to  
8 overcome those incremental costs that are likely required  
9 with these types of upgrades.

10 You know, because some of these technologies are  
11 newer technologies, they may be more finicky and prone to  
12 needed repairs. And these early adopters are likely going to  
13 be able to afford the cost of any required repairs.

14 So again, my shout out to my colleagues, Charlie if  
15 you're listening, how do we get these customers more excited  
16 about that all-electric path? This program does run until  
17 the end of 2020 and, unfortunately because of COVID, we  
18 likely have some delays, but we do have a couple of months  
19 left, so let's -- let's get on it.

20 All right. Next slides.

21 So transitioning to the San Joaquin Valley  
22 Disadvantaged Community's Pilot. So this pilot was designed  
23 to test the economic feasibility of replacing alternative  
24 fuels, propane and wood, appliances with all-electric  
25 appliances. And so I'm going to focus on the pilots in

1 PG&E's territory. PG&E, there's eight communities that we're  
2 going to serve. PG&E is the administrator for three, and  
3 then RHA is our administrator for the other five.

4 And so, as of today, the pilot seeks to retrofit just  
5 1,260 homes. So not that many, but a really good sample size  
6 for us to test how we will -- how we can move forward from an  
7 equity perspective, this idea of decarb and electrification  
8 for -- for lower income customers.

9 So like many of our programs, there's been slight  
10 delays because of COVID. The outreach for this program in  
11 customer acquisition was supposed to start in April so of  
12 course with face-to-face communications, but we've had to  
13 pivot a little bit and so our Community Energy Navigator, as  
14 we call them, our CVO, is now pivoting to virtual outreach.  
15 And so they started that in May. So we do actually have a  
16 couple of applications in the pipeline. So that's exciting  
17 for us to be able to start. Once the shelter-in-places are  
18 lifted, we'll be able to start the home assessments and get  
19 these installations happening.

20 So while we don't have a lot of lessons learned yet  
21 from the pilot, we do have three preinstall learnings that I  
22 think are really important for this conversation. And so as  
23 Julia mentioned, for these kinds of communities, in  
24 particular communities that have been disenfranchised for  
25 many, many years, that idea of trust is critical. And so we

1 believe that bringing in a CVO or a group of CVOs who had  
2 these relationships with the customers were really the right  
3 tool to help us best engage these customers and ensure robust  
4 participation.

5           Secondly, service planning upgrades. As  
6 electrification adds loads, we are going to likely have to  
7 manage our infrastructure upgrades. And in some cases, this  
8 really could add additional cost to whole building  
9 electrification. Particularly costs associated with to the  
10 meter and behind-the-meter, and who pays for what. These are  
11 some of the challenges that we'll have to figure out as we  
12 move forward and scale these types of opportunities.

13           Household remediation could be a really big barrier  
14 to installations. And I recall, I believe Aimee was talking  
15 about in one of their incentive programs, they've added  
16 additional funds for the electrical panel upgrades. So  
17 that's also included in San Joaquin. The great news is that  
18 for us, that's actually included in the implementation  
19 budget. We do have a separate budget for remediation, but  
20 it's pretty limited to -- it is \$5,000 per home. And it's  
21 limited to primarily what's needed for safety perspective and  
22 to be able to operate the appliances. But our hypothesis is  
23 that we likely are going to need, or the customers are going  
24 to need more remediation to really effectively operate these  
25 appliances. And today we don't have the funds to cover

1 those. And so that's the question of where do we get these  
2 additional funds to ensure that that customer has a really  
3 good experience with the all-electric choices they're making.

4           And then last but not least, you know, I think the  
5 question for these -- this, the low-income sector is, while  
6 we don't want to leave them behind, there still I think are  
7 questions around the costs of these technologies if they  
8 should break. And will these customers be able to cover any  
9 costs associated with needed repairs, you know, five years  
10 down the road when we're gone.

11           So those are the things that we're really interested  
12 in learning more about. And this is why this pilot, on so  
13 many levels, is very exciting for all of us as we continue to  
14 learn and understand, how do we electrify our disadvantaged  
15 communities and our low-income customers and communities?

16           Next slide. Doesn't really matter, it's just the  
17 ending slide.

18           I really appreciate being part of this conversation.  
19 We are thrilled to be part of the solution and we're really  
20 looking forward to all the learnings we learn through our  
21 pilots and our -- their demonstration projects and continuing  
22 this conversation with all of our colleagues.

23           So thank you very much.

24           MR. ROSALES: Thank you, Meghan. That was a really  
25 good presentation.

1 I think you were hitting on some really important  
2 points and we might come back to those in the Q&A session.  
3 In terms of just implementation, especially direct  
4 implementation with a community that have had long standing  
5 barriers, especially economic barriers. So thank you for  
6 sharing those insights with us.

7 I'm going to transition now, if that's okay, to  
8 Panama. Can you hear me?

9 MR. BARTHOLOMY: I can.

10 MR. ROSALES: Can you give me a thumbs up?

11 MR. BARTHOLOMY: Yep.

12 MR. ROSALES: There it is. All right.

13 Okay. Panama Bartholomy is our fourth panelist  
14 presenter. Panama is the Director of the Building  
15 Decarbonization Coalition, in multisector forum advocating  
16 for and creating solutions for our pollution intensive  
17 building stock. Very true.

18 Previously Panama was a European director of the  
19 Investor Confidence Project where he worked to unlock capital  
20 markets for energy efficiency project development. Panama  
21 was the advisor on Energy and Natural Resources to California  
22 Assembly Speaker John A. Perez. He has served as deputy  
23 director for the CEC Efficiency and Renewables Division, and  
24 advisor -- an advisor for Chairwoman Douglas. And, you're  
25 going to have to help me with that last name, Pfannenstiel?

1 MR. BARTHOLOMY: Pfannenstiel. Yep. That's love.

2 MR. ROSALES: He has -- he has worked for the  
3 California Conservation Corps on vocational  
4 environment -- environmental education and ran the  
5 sustainable schools program for the Division of the State  
6 Architects.

7 Panama served on the City of Sacramento Planning  
8 Commission, and the County of Sacramento Environmental  
9 Commission, and is a former board member on the U.S. Green  
10 Building Council, USGBC, and past president of the Northern  
11 California Chapter of the USGBC. He has worked on climate  
12 solutions in over 30 countries. Presented at, and  
13 collaborated on products from the United States, from the  
14 United Nations, the International Energy Agency, and the  
15 European Commission.

16 Wow. Thank you, Panama. Thank you for joining us  
17 today.

18 With that, I will turn over the dais to you, if you  
19 want to start your slides. There you are.

20 MR. BARTHOLOMY: Wonderful. Thank you. Am I  
21 required to say, can you hear me?

22 It is great to be back at the Energy Commission.  
23 Thank you so much for having us on this panel and for putting  
24 on this workshop. I'm very excited. Great panelists led up  
25 to this, and I'm really excited for the rest of the day as

1 well.

2           You know, the pandemic and our remote presentations  
3 now, I think there's a lot of downsize from the loss  
4 connection of in-person presentations and dialog, but I will  
5 say, it's allowing me to fulfill a lot of my dreams of, you  
6 know, finally being able to give presentations in jorts. So  
7 I'm real excited to be here and thank you for having the  
8 Coalition.

9           The Coalition, just briefly, is a cross sector  
10 collaborative of energy providers, utilities and CCAs,  
11 manufacturers of heating equipment, the design and  
12 construction community, local governments and nonprofits.  
13 And we are all working together in order to be able to  
14 eliminate emissions from the built environment by 2045, or  
15 sooner, through policy and market mechanisms.

16           We released a roadmap for California's buildings in  
17 January of 2019 that laid out in only 16 pages how we thought  
18 California should move forward in a way that could lead  
19 towards the total decarbonization on this building stock.  
20 And in there we put a series of numerical targets that we  
21 think California's going to need to meet in order to be able  
22 to achieve this. And this -- by eliminating emissions by  
23 2045, it is right in line with the same path that we get out  
24 of AB 3232 of 40 percent below 1990 levels by 2030. And so  
25 you can see that we also took AB 3232 targets and put it into

1 our numerical targets there under the retrofits.

2           So we called for new buildings to meet a  
3 zero-emissions building code for residential buildings by  
4 2025, if not sooner. And commercial by 2028. And then the  
5 implementation of policies that lead toward the overall  
6 reduction of greenhouse gas emissions from the built  
7 environment, so that we're stepping down. And then by 2045  
8 or sooner, we're at zero emissions.

9           Complicit in that is going to be the success of sales  
10 of the critical technologies behind electrification, in  
11 particular, heat pumps. And so we called for a specific  
12 market share. Market share targets for heat pump water  
13 heaters and heat pumps for space conditioning as well, in  
14 order to be able to allow us to meet these numerical targets  
15 above it.

16           Underneath those numerical targets, we also  
17 identified five major principles that are going to have to be  
18 realized if we're going to have a chance of meeting those  
19 targets and decarbonizing our building stock. And as we are  
20 looking at policies, and the policy mix to be including in  
21 the AB 3232, and as we look at policy implementation at the  
22 Energy Commission and other Commissions, we feel like these  
23 five need to be underpinning our policy development. Because  
24 if we don't have any one of these, our policies will not be  
25 successful. It is only through the incorporation of all of

1 these that we're actually going to be able to one,  
2 decarbonize. Or two, come anywhere close to doing it at the  
3 speed at which we're trying to do it.

4 And so just briefly, the first goal is on awareness.  
5 You've heard a lot from the panelists before me about the  
6 need to raise awareness from both customers and installers,  
7 but also policymakers about the benefits of building  
8 electrification. The many benefits.

9 Customers need to receive a good value from adopting  
10 building decarbonization measures. If they're paying more on  
11 a monthly basis than they were when they were when they had  
12 the high carbon household or building, this is just not going  
13 to work. It will collapse under its own weight. And so  
14 through a combination of incentives, electrification rate  
15 reform, and financing programs, we need to make sure we're  
16 providing a good value for customers.

17 Third, the building decarbonization needs to provide  
18 the better value proposition to contractors and builders.  
19 Contractors and builders can't make less money building  
20 all-electric than they do building with gas. And so we need  
21 to be going through code based incentives, streamlining, and  
22 financial incentives to make sure that we are transitioning  
23 in a way we're allowing people to actually run viable  
24 businesses, and building up the types of markets that we want  
25 in California to allow them to make more money doing the

1 things that we want them to be doing instead of less.

2           And Goal Number 4 is making sure the supply chain is  
3 robust and we've gotten barriers out of the way. And so a  
4 big part of this is -- falls on policymakers of California to  
5 send a really clear message to the manufacturing community of  
6 this is where California is going, unequivocally, and here is  
7 the schedule and what it looks like, so then our supply  
8 chains can start to get ramped up and ready for it. And then  
9 we need get the barriers out of the way of the supply chains,  
10 like electrical panels.

11           And then lastly, we need to align our policies.  
12 We're not going to meet our climate goals or our clean energy  
13 goals if we're continuing to lay new fossil fuel  
14 infrastructure and relying upon it. And so we need to make  
15 sure that our -- our housing goals, our school construction  
16 goals are aligned with our climate goals and our clean air  
17 goals. And we're not using any of our policies out of  
18 alignment with the other ones. So those five major  
19 principles we'll need underpin any policy approaches.

20           So just quickly, going through new builds and  
21 retrofits. A new build, you know the issue here isn't so  
22 much one of cost. The California Building Industry  
23 Association, with Navigant, put out a report in 2018 looking  
24 at the impacts of residential appliance electrification. And  
25 just a couple, I think pertinent quotes coming from that

1 study up there on the screen is that electric appliances have  
2 a similar or lower cost than natural gas appliances for new  
3 construction. You know, usually the big discrepancy is  
4 Heat pump water heaters compared to a gas storage water  
5 heater, but for much of new build in California for single-  
6 family, we're using on demand. So it's a higher cost. It's  
7 the same or even higher than a heat pump water heater.

8           And then second, the total installed cost increase  
9 for electric appliances for a new single-family home, this  
10 report says that it'll add about 185 to 418 dollars for a new  
11 single-family home. And that this report did not include all  
12 of the savings from not putting in the gas infrastructure to  
13 the building, in the building, in the venting to get the  
14 pollutants out of the building.

15           And so a clear message from California's Building  
16 Industry Association that building all-electric many times  
17 can be cheaper once you're bringing in all those -- all those  
18 cost savings and the appliances are basically same. So the  
19 cost isn't so much the issue, although I don't want to  
20 minimize the fact that builders that are making the  
21 transition from historically building with gas, will have  
22 this transition period of needing to figure out how we're  
23 going to go -- be going all-electric into the future. And we  
24 need to be working with the building industry to really  
25 understand their concerns and to be able to help them

1 overcome it. So programs like Build are going to be critical  
2 in these early years to help do that.

3 And so one of the efforts along those lines that we  
4 did is we interviewed a series of home -- home builders  
5 across California in a all-electric residential new  
6 construction needs assessment. And we interviewed just under  
7 30 builders and energy consultants. Building a market rate  
8 affordable multifamily, single, custom production, and all  
9 over California we interviewed some of these folks. And so  
10 definitely not a representative sample, but I think the  
11 answers we got were very representative.

12 You know, two-thirds of the builders that we  
13 interviewed had never built an electric home. And largely  
14 what they said is what you heard some of the other panelists  
15 say was, you know, cooking was the biggest problem, and this  
16 perception of how bad electric cooking is, and what are we  
17 going to do about it. And then a lack of familiarity with  
18 heat pump technology.

19 And what -- as Meghan mentioned, what came out of  
20 this was that upwards of 90 percent of builders we  
21 interviewed are very interested in building all-electric.  
22 But what they said is, you know, a lot of the barriers that  
23 we see to electric are perception issues. And we builders  
24 can't be responsible for changing the perception of people  
25 about what an all-electric cooking, in particular, looks

1 like. And so the main recommendation coming out of this  
2 report from builders was a large-scale consumer education  
3 program, really touting the benefits of building  
4 electrification.

5           On existing buildings, really our opportunity is here  
6 at stock turnover. In between now and 2045 when we're trying  
7 to reach carbon neutrality, and we are all, each of us going  
8 to replace our water heater, you know, two to three times.  
9 And our -- whatever we use for space heating will probably  
10 replace it at least once, if not twice.

11           And so this is a critical moment we have where an  
12 investment is already going to be made by a landlord or by a  
13 homeowner and we need to be able to put in place the programs  
14 and create the environment so that they're making the kind of  
15 choices we want them to make rather than staying with fossil  
16 fuels.

17           And this is the biggest issue in this space is that  
18 you never think about your water heater or your furnace until  
19 it's broken, or until it's not working. And this emergency  
20 nature of these replacements creates a real problem for this  
21 transition over to renewable energy in using clean  
22 electricity.

23           And this is -- this played out in our needs  
24 assessment of installers and contractors across California  
25 where we interviewed HVAC installers and water heating

1 installers. And -- and it very much came up of, you know,  
2 why would a plumber want to learn something about building  
3 electrification and installing heat pump water heater when he  
4 can put in his normal water heater he's always put in and get  
5 several done in the day if he wanted to.

6           And so this issue of a value proposition for an  
7 installer is critical. We need to make sure that we're  
8 implementing policies and programs in such a way that the  
9 installer is making more money off of installing the heat  
10 pump water heater, or the heat pump, than they are off of the  
11 gas unit. Particularly in these early years in the ramp up  
12 of our policies.

13           The other big part in the emergency problem  
14 for -- for existing buildings is as was mentioned by Meghan,  
15 panel upgrades and wiring. Panel upgrades are anywhere from  
16 2500 to 4,000 dollars to do a panel upgrade, and then you  
17 need to run wiring in order to get to the heat pump  
18 technology. And depending on the size of the house and  
19 location, that can be anywhere from 3000 -- 300 to 1,000  
20 dollars.

21           And this is the picture of my old electrical panel.  
22 It took me five weeks in order to be able to coordinate with  
23 the utility, with the city and the electrification, and the  
24 electrical worker to be able to get this upgraded. And when  
25 your hot water heater is broken and you want water -- hot

1 water back that night, five weeks just won't cut it in order  
2 to be able to get a heat pump water heater in. And so we're  
3 going to need to find ways to be replacing this  
4 infrastructure in homes so that they're electrification ready  
5 by the time that a heat-pump water heater is going to be  
6 installed.

7           So I'll just finish up with some recommendations.  
8 For new construction, along the lines of aligning policy, we  
9 need to stop state funding for gas infrastructure expansion.  
10 It doesn't make any sense for us to be fighting to meet  
11 climate goals, and then funding the development of housing  
12 and state buildings that are now laying in gas infrastructure  
13 that will last for 60 to 80 years and make it harder for us  
14 to meet our goals.

15           We need to be putting in code compliance incentives  
16 to be able to help builders along this path and help them in  
17 their first couple developments to be able to learn how to do  
18 this and get an advantage from doing this. And providing  
19 technical support to them. As the builders ask, a  
20 large-scale consumer campaign. And then moving towards an  
21 emissions-based code that gives us the type of buildings  
22 we're going to need in order to be able to meet our goals.

23           On existing buildings, we fundamentally need to  
24 change the value proposition for electrification  
25 technologies. And we think this needs to be done through a

1 Clean Heat Initiative that is providing a long-term incentive  
2 for heat pump technology that is able to provide a lower cost  
3 at the point of sale at a retailer or at a distributor for an  
4 installer or a homeowner to be able to make that immediate  
5 choice of the electrification technology is cheaper than what  
6 I'm seeing with the gas technology right next to it. And  
7 then something similar for clean cooking as well. And then  
8 induction technology.

9           We're going to need to make a major investment in  
10 building electric infrastructure modernization. Southern  
11 California Edison has done some behind-the-meter investments  
12 in electric vehicle charging infrastructure and it could be a  
13 model for us looking forward. But we're going to have to  
14 deal with the issue of electrical panels for existing  
15 buildings. And then a large-scale consumer campaign.

16           And then just some cross-cutting issues. You know,  
17 the biggest danger of our successes is that everybody that  
18 can afford to electrify begins to electrify, and we leave  
19 behind those communities that don't have the capital  
20 resources to electrify. And they're the ones paying the  
21 increased gas bill from having to maintain the system. And  
22 so instead what we should be doing is really working with our  
23 low-income weatherization programs to turn them into  
24 low-income electrification programs and have these  
25 communities at the front end of our policies and transitions,

1 rather than the back end.

2 We have the most successful building decarbonization  
3 program in the country in California. The Low-Income  
4 Weatherization Program, or LIWP, and we struggle every year  
5 to fund it. And we need to be able to make, not only fund  
6 it, but fund it at a much higher degree than we ever have.  
7 The rate reform and financing are going to be critical. And  
8 then making sure we're getting the technology in and starting  
9 a long-term proceeding to get off of gas.

10 So I'll end here with these last three slides. This  
11 is also out of our roadmap and it shows the market share of  
12 sales for water heating technology. Natural gas in blue and  
13 the high efficiency heat pumps in gray. And it shows that,  
14 you know, with a 15-year -- 12- to 15-year lifespan for an  
15 average water heater. And we're trying to get to carbon  
16 neutrality by 2045. We need to basically be phasing out, as  
17 for the sale of natural gas water heaters by around 2030.  
18 That's a steep decline between now and 2030, ten years  
19 dramatic change within the marketplace.

20 But California has a history of doing this. You  
21 know, we have taken challenges like this and we apply  
22 ourselves, we've been able to make it happen. And the  
23 California Solar Initiative is a perfect example of that. We  
24 looked at a technology and we said we want to be able to have  
25 this just as standard within our homes across California. We

1 need to make the investments, not only the financial  
2 investments but also the regulatory investments to be able to  
3 streamline this to make it possible. And through the  
4 California Solar Initiative, we completely, with the Germans  
5 and the Japanese, completely transformed the solar industry,  
6 and were able to bring down costs to the point where last  
7 year the Energy Commission was able to make this a standard  
8 requirement of homes in California. We need a program of  
9 this scale and of this vision for electrification technology  
10 as well.

11           And then lastly, what my members who are  
12 manufacturers tell me constantly is, we need a clear message  
13 from California. You know, you guys are doing great work.  
14 California's going to be rolling out \$450 million of  
15 electrification incentives over the next nine months, from  
16 utilities and CCAs. And so we're starting to show that we're  
17 serious about this. But the manufacturers, if they're going  
18 to be making the investment in the manufacturing  
19 infrastructure in order to be able to provide the supply  
20 chains we need, they tell us we need some certainty from  
21 California. And it's going to be outreach like this from  
22 Commissioner Randolph that talks about the long-term gas  
23 proceeding that she's leading. And articulating it in a very  
24 clear way that this is California preparing to shift away  
25 from natural gas. And we need you to start the conversations

1 and the proceedings that you're going to outline how we're  
2 going to do this in the most equitable and quick way as  
3 possible.

4 So thank you for having me. We look forward to  
5 participating the rest of the day and participating as you  
6 develop the report further.

7 MR. ROSALES: Thank you, Panama. That was a great  
8 presentation. So I want to thank you Panama for that  
9 presentation.

10 Meghan, Julia, Aimee, thank you all for your  
11 presentations.

12 We will now transition into the question and answer  
13 session. Let me pull up, before we do that, I need to pull  
14 up. Great.

15 So, Commissioner McAllister, if you can hear me, I'm  
16 going to give you and --

17 COMMISSIONER MCALISTER: I can. Can you guys hear me  
18 and without static?

19 MR. ROSALES: I can hear you. You want to give me  
20 the Zoom thumbs up, even though we're on WebEx?

21 COMMISSIONER MCALLISTER: Yeah. I mean, you should  
22 be able to see me and hear me.

23 MR. ROSALES: We got you. We can hear you. So I  
24 think the Chair -- I think the Chair has signed off, but I'm  
25 turning over the first opportunity for questions to the

1 Commissioner and the Chair, if he's still on the line, for  
2 our panelists.

3 COMMISSIONER MCALLISTER: I appreciate that, Eddie.  
4 Thanks a lot. And thanks for moderating.

5 Thanks to all the panelists. This was really content  
6 heavy, and I don't want to monopolize the questions so I'm  
7 going to do my best not to do that.

8 So I guess I have a question for Julia, and then a  
9 question for Meghan, and then maybe a question for everyone  
10 to comment a little more broadly. So, you know, I want  
11 to -- I always try to keep it real, right. I mean, we've all  
12 given some examples of activities out there that you're doing  
13 that really are interfacing with customers, users, different  
14 places and economic situations. You know, and I want to  
15 invite everyone, everyone listening, but certainly you on the  
16 panel who are really in this day to day, you know, help us  
17 understand what scale looks like in your reality.

18 I want to start with Julia. You know, you talked  
19 about the community engagement piece of it, which I  
20 completely agree with you. It's critical. You know, people  
21 have to have trust. They have to have a familiar face.  
22 There needs -- there's a certain amount of, you know, it can  
23 be relatively high touch. But it takes this community  
24 building, really, to build a foundation.

25 I was a Peace Corp volunteer, you know, back in the

1 day. A long time ago. And it really strikes me as a similar  
2 activity. You've really got to like start with the community  
3 and listen. What do they need? How can it be really  
4 completely focused on -- on them?

5           So that -- that's a great principle that I think we  
6 should keep central. That also costs resources, you know.  
7 That takes resources. Somebody has to be able to walk the  
8 neighborhood and talk to people and have coffee and, you  
9 know, all that sort of stuff to gain the kind of forward  
10 momentum to start an initiative like this.

11           So -- and so I guess, you know, if we sort of try to  
12 back up and look at it in a little more detached way. You  
13 know, each family, each house, each community, if you do the  
14 numbers and the math, and you're talking about upgrading  
15 existing homes, that's a lot of resources. It's a lot of  
16 money and it's got to come from somewhere. And so I'm going  
17 to invite you first, and then perhaps Meghan, you know,  
18 around the Silicon Valley Project to give us a, kind of a  
19 ballpark, or help us imagine what scale, you know, in  
20 millions of relatively low-income, disadvantaged communities,  
21 and residents. What it will take over the next 10, 15, 20  
22 years to get us there?

23           MS. HATTON: Thank you for that question. And yeah,  
24 thank you for recognizing that the community outreach does  
25 require resources. I think one pitfall, or one shortcoming,

1 is sort of assuming that community-based organizations are  
2 already out in the community, and already talking to people  
3 and don't need to be funded to do that work. And that has  
4 led to underinvestment in things like marketing, education,  
5 outreach.

6           You know, when we do our outreach for our Residential  
7 Energy Efficiency Program, we're talking attendance at  
8 hundreds of events. We start in February for programs that  
9 we run in June. We typically will -- we'll typically have to  
10 touch about three times as many people that we're aiming to  
11 actually provide services to, to get to that number. So  
12 there's about a 30 -- there's about a 30 percent drop-off  
13 rate from developing these wait lists and things like that.

14           So it does cost money. Sometimes people ask us, you  
15 know, what's our secret sauce for reaching so many people?  
16 And the answer is that we put -- we put the time and the  
17 resources into people -- having people on the ground. You  
18 know, that being said, when Rising Sun provides say energy  
19 efficiency services in one community. Let's say we hire 20  
20 people. Let's say we serve about 250 to 300 homes. You  
21 know, that's about \$160,000 investment for providing  
22 residential energy efficiency services, and outreach, and  
23 things like that.

24           So, you know, you could scale that out and do some  
25 quick back of the envelope math on that. I can certainly get

1 you more details if that would be helpful.

2 COMMISSIONER MCALLISTER: Great. Well thanks a lot  
3 for that. And maybe, Meghan, if you could give us some  
4 perspective on the Silicon Valley stuff. I was really  
5 excited that, you know, you said that 1,200 homes or so isn't  
6 that much, and it's not in the grand scheme of things. But  
7 it's still I think more than previous efforts and enough to  
8 really teach us quite a bit.

9 And, you know, I -- I actually built myself an all-  
10 electric, net positive actually still house. And we've been  
11 living in it for about a year. And, you know, I can vouch  
12 for the quality just of the indoor air and just health  
13 impacts, just the quiet. All the, you know, many, many co-  
14 benefits that don't even have anything to do with energy  
15 necessarily. You never have to dust, you know, things like  
16 that. Just the air is clean.

17 MS. DEWEY: That's great.

18 COMMISSIONER MCALLISTER: And so, you know, that  
19 helped me learn a lot about what it would take to do this  
20 from scale. And there is an incremental cost. But I think,  
21 you know, working with the builders. And I think Panama  
22 talked about some of those issues that we can, and need to  
23 get down, and go to scale. On the low-income and the  
24 existing buildings really is where I'm most concerned.

25 MS. DEWEY: Yeah.

1           COMMISSIONER MCALLISTER: And so I'm super interested  
2 in that -- in that how -- that Silicon Valley pilot in  
3 particular, but the other efforts as well.

4           You know, we want to -- well maybe I'll just let you  
5 comment on that and just sort of, you know. Have you  
6 extrapolated the cost? Like, if you really wanted to target  
7 all of your customers that, you know, could help make the  
8 transition, you know. What does that add up to? And have  
9 you thought about -- I have a follow up question, but maybe  
10 I'll just let you get that one.

11           MS. DEWEY: Sure. Well just one note. It's the San  
12 Joaquin Valley, not Silicon Valley.

13           COMMISSIONER MCALLISTER: Oh, I'm sorry. I'm sorry.  
14 San Joaquin Valley. I'm sorry.

15           MS. DEWEY: That's okay.

16           COMMISSIONER MCALLISTER: That would -- yeah.

17           MS. DEWEY: So I'm sure that we have, before my time  
18 on this -- on this project, and I'll ask phone a friend in a  
19 minute. But just to set some context. So in (indiscernible)  
20 these territories, I mentioned, there's eight communities,  
21 with two administrators totaling 1260 homes. The budget for  
22 that, in total, is around \$35 million. So that's our all-in  
23 budget. And so frankly, that's not a lot, right, for that  
24 many homes. So this will be an expensive endeavor to scale.

25           And I -- one of the goals as part of the San Joaquin

1 Pilot is for our CVOs and our Community Energy Navigators to  
2 help us identify other funding sources. Because they're  
3 also -- not only are they great at building that trust, they  
4 also have inroads into so many different organizations and  
5 opportunities. And they're -- and because of that trust  
6 they, I think -- I mean, my hypothesis again is that they  
7 will able -- be able to help us expand the reach of our  
8 dollars and get more dollars collaboratively to build out  
9 these low-income electrification types of programs.

10 COMMISSIONER MCALLISTER: And then in terms of, sort  
11 of the extrapolation, I mean there's, you know, Panama  
12 mentioned the OAR over the PUC that's going to look at the  
13 future of natural gas. And you know, you highlighted your  
14 efforts at PG&E to support local governments, you know, to  
15 move in this direction. So certainly applaud those efforts.

16 You know, if you do extrapolate what, you know,  
17 unwinding the -- the -- picking apart the natural gas sort of  
18 investment profile going forward across your territory and  
19 looking at the families that you'd have to assist. You know,  
20 it would be good, not necessarily right now at the top of  
21 your head but it'd be good to understand how, you know, what  
22 that capital requirement is going to be.

23 MS. DEWEY: Yeah.

24 COMMISSIONER MCALLISTER: And we've got to unpack  
25 that in terms of the business model, you know, really because

1 as we all agree, I think, we can't expect every customer, you  
2 know, certainly the ones that can't afford it, which are  
3 multiple, which are many. You know what, so learning from  
4 San Joaquin Valley and understanding the profile of what that  
5 has to look like locally is super important. But we have to  
6 extrapolate that across your service territory and for  
7 their -- for their field.

8 MS. DEWEY: Yeah. And, you know, I will add what I  
9 think will be interesting -- I mean, the San Joaquin, it's  
10 going to provide us so many insights, and I think lots of us  
11 are very excited about this because as we built these pilots,  
12 and budgets, and so forth, there were a lot of unknowns.

13 And one of the things I mentioned were the  
14 infrastructure costs that while we estimated them, we don't  
15 really know what they're going to be. And that'll be  
16 interesting across California to really understand to the  
17 meter and behind-the-meter, those kinds of infrastructure  
18 costs. Not just the panel upgrades, but what are all those,  
19 you know, wire upgrade costs going to be. And is there  
20 anything we can do proactively to get ready for that?

21 COMMISSIONER MCALLISTER: Okay, great.

22 MS. HATTON: Yeah, and if I might add, you know, I  
23 think -- I think leverage is essential. I think that, you  
24 know, economies of scale happen when you start building out  
25 from pilots. But I think it's also important to consider

1 what is the cost of not doing this work? And not just  
2 financially, right, but from a health perspective, from a  
3 social perspective. Those are things that I think really  
4 need to be quantified as well.

5 COMMISSIONER MCALLISTER: Yeah, there's some great  
6 work happening on the health quantification. I think we  
7 could actually engage on our RND front to help figure out how  
8 we would look at a sample, work with a healthcare provider,  
9 you know, a large HMO or something to really gather some data  
10 and figure that out. Because I think we would see --  
11 maybe --there's a way to, you know, use the sample from the  
12 San Joaquin Project to see what the health income, what the  
13 access to healthcare, you know, the provision of healthcare,  
14 the demand for healthcare services. Maybe looks like if  
15 that's a big enough number.

16 MS. HATTON: That's interesting.

17 COMMISSIONER MCALLISTER: Just an idea. I was  
18 wondering also on the San Joaquin Valley, is there any load  
19 flexibility component to this that PG&E is looking at  
20 implementing or putting alongside --

21 MS. HATTON: I know --

22 COMMISSIONER MCALLISTER: -- you know, the  
23 Dual electric load could be manipulatable and help with grid  
24 resources and those sorts of things?

25 MS. HATTON: It's very true. I don't believe that we

1 considered that as part of the pilot. But it is an excellent  
2 idea, especially as we thinking -- as we're thinking about  
3 scale.

4 COMMISSIONER MCALLISTER: Okay. So I would encourage  
5 that, and happy to interact further on that.

6 MS. HATTON: Yeah.

7 COMMISSIONER MCALLISTER: And then maybe this is for  
8 everybody, and obviously should, you know, Aimee and Panama  
9 feel free to comment on any of the above. But, you know, the  
10 idea of leverage and sort of combining resources to fund  
11 these retrofit efforts you know, at scale. You've mentioned  
12 bits and pieces of this in different ways. But what are, you  
13 know, so I think it's the low-income, disadvantaged  
14 communities, you know, I think it's difficult to expect lots  
15 of it to be self-funded. You know, not much probably.

16 So where does that capital come from? You know, how  
17 do we engage capital markets? How do we sort of make the --  
18 make a case and create fertile territory so that others come  
19 in and plant the seeds and do the work?

20 MR. BARTHOLOMY: I'll start, Commissioner. Thank you  
21 for those questions.

22 I think my answer is also going to relate to your  
23 previous comments about costs for existing buildings. And  
24 so, you know, I mentioned in my presentation this opportunity  
25 we have at stock turnover, and the regularity of that stock

1 turnover, and the frequency of it. And so I think that, you  
2 know, when your water heater breaks, you're already going to  
3 have to buy a water heater. And you're going to -- you want  
4 that hot water back.

5           And what we need to be thinking about is through a  
6 combination of incentives and regulations, how do we make  
7 sure that the nonpolluting option is the cheaper and better  
8 option? The easier option for people.

9           And so I don't believe that even in low-income  
10 situations that the state has to bear the responsibility of  
11 the whole project costs of electrification technology. But  
12 if we want it at the scale and the speed that we want it at,  
13 we do need to be able to make that easier and cheaper than  
14 the -- than the gas costs. So I think that's going to be the  
15 programmatic approaches.

16           And the critical thing that installers and  
17 manufacturers tell us really is, it's at that point of sale.  
18 And they need to be able to go in and when they're looking at  
19 a water heater next to a heat pump water heater, see that the  
20 heat pump water heater is cheaper. And so that's why  
21 midstream and upstream rebate approaches are going to be  
22 critical for existing buildings.

23           MS. BAILEY: This is Aimee. I might just add a  
24 couple more things. I think one thing that we're very  
25 interested in, and this is from work, actually from Panama

1 and the Building Decarb Coalition is the opportunity for  
2 tariffed on-bill financing. And there are people on this  
3 workshop call that know more about it than I do, but in that  
4 case, the financing would be tied actually to the meter as  
5 opposed to the customer. And so you can overcome a lot of  
6 barriers as it relates to kind of credit worthiness of the  
7 occupant itself.

8           So that's something that we're very interested in and  
9 looking forward to the final report from the Building Decarb  
10 Coalition on their recommendations from that.

11           I think another thing that we've been discussing with  
12 different stakeholders including, you know, in various  
13 conversations with PG&E and others, like is there potentially  
14 some opportunity for the policy to kind of shift as it  
15 relates to how much of the cost PG&E is allowed to rate  
16 based, as opposed to the customer taking on this cost when  
17 there are distribution system upgrades.

18           So that might be another lever that could be used  
19 that could be especially impactful for low-income customers  
20 and multi -- multifamily dwelling properties.

21           COMMISSIONER MCALLISTER: Thanks for those comments.

22           I will cede the dais, and let's see, let Eddie and  
23 Jen take it back and see if there are other questions for our  
24 panelists.

25           MR. ROSALES: Thank you, Commissioner.

1           Thank you, Panelists, for those responses. They're  
2 all very insightful. I think those are all important  
3 components of, you know, really getting the building  
4 decarbonization momentum started in California. Talking  
5 about outreach. Talking about financing options, and talking  
6 about assessing the sector through the different equipment  
7 that's out there and how we can do that. So thanks for  
8 those -- for those responses.

9           So we are slightly a few minutes past time, but we  
10 are going to take some questions that have come over on the  
11 chat box from some of the participants.

12           So Brian, can you -- Brian or Dorothy if you are on  
13 the line, if you can help me read one question at a time,  
14 we'll try to reserve a few minutes for this. And then if  
15 they're directed to a panelist, please let the panelist know.  
16 Or if they're a general question, we'll figure out the best  
17 approach.

18           So Brian, Dorothy, can you help me out with that?

19           MR. SAMUELSON: Yes. This is Brian. I'm going to go  
20 up to the -- the first one. We've got a lot of information  
21 in chat, so I need to scroll up and find the first one.

22           Okay. Thank you for waiting. The first one is for  
23 Aimee Bailey. This comes from Philip Escondido.

24           Is the production of electric energy a barrier? And  
25 he also asks production of electric -- or mentions production

1 of electricity may not be considered clean.

2 MS. BAILEY: Yeah. Thanks very much for the  
3 question.

4 I think it's -- if by that question you're referring  
5 to do we anticipate there will be enough renewable energy to  
6 meet the increase in demand through electrification. The  
7 answer is yes. For SVCE in specific, given we're a fairly  
8 new organization, a new CCA, we've -- we're still in the  
9 process of building up our supply portfolio. We've signed a  
10 half a dozen power purchase agreements for new renewable  
11 projects that are currently being built. And we actually  
12 have an RFO out for more. So shopping for more.

13 And so it certainly takes time to build those  
14 projects and for them to come online. But the entire state  
15 is -- is definitely moving in the direction of an extremely  
16 clean grid. And, at least from the statewide studies that  
17 I've seen from like through the Pathways Project and other  
18 entities, there isn't necessarily concern about there being  
19 electricity supply constraints for high electrification  
20 scenarios.

21 I hope that answered the question.

22 MR. BARTHOLOMOY: And I would -- I would just add  
23 that just about two weeks ago, the Sierra Club released a  
24 national study looking at the benefits of electrification.  
25 And what they found is, they looked at different grid mixes

1 across the entire United States. And what they found is  
2 because of the inherent high efficiency of heat pump  
3 technology, sometimes three to four hundred times more  
4 efficient than the best natural gas alternative, is that even  
5 in those grid mixes, that a high fossil fuel mix, it was  
6 still better from a greenhouse gas perspective to go all-  
7 electric than to rely on gas.

8 Even those areas like West Virginia that still have a  
9 high coal mix, because heat pumps are just so efficient, it  
10 still made more sense to go with the heat pump rather than go  
11 with the gas alternative. I'll post a link to that study in  
12 the chat.

13 MR. ROSALES: And I got to say, this is Eddie again.

14 There's been -- there was questions about the  
15 docketing of Panama's presentation. That presentation will  
16 be docketed either today or early next week. So I just want  
17 to make sure folks know that. Some folks were asking about  
18 that. But all other presentations have been docketed onto  
19 the proceeding webpage.

20 Brian, do you got a second question?

21 MR. SAMUELSON: Well, yes. There's a lot of  
22 questions. I'll move onto the second one. All right. This  
23 one is  
24 by -- from Eric Law.

25 So he says: Instead of upgrading panels to 200 amps,

1 could there be an option to add a battery with a home solar  
2 system to handle these peak energy needs?

3 Then he follows up by saying: If we start upgrading  
4 large numbers of old homes to the 200 amp service, it will  
5 require utilities to upgrade their infrastructure to support  
6 these larger services.

7 MR. ROSALES: That's a good question. Maybe Meghan  
8 and Panama, do you want to provide some insight to responses  
9 to that one, it deals with some of the infrastructure and the  
10 panels on the buildings?

11 MS. DEWEY: Well, I can agree with the former, or the  
12 latter part of his comment that yes, that's one of the things  
13 that we hope to learn from the San Joaquin pilots is what are  
14 these infrastructure costs going to be? Both for the utility  
15 as well as potentially for the customer.

16 Now in San Joaquin we're covering the cost of the  
17 customers, but as we scale, you know, that may have to change  
18 just because of the kinds of costs we may incur. I'm not  
19 technical enough to speak on the battery topic, but  
20 potentially one of my colleagues is.

21 MR. ROSALES: Thank you. Panama, do you want to  
22 speak to the panels on the building?

23 MR. BARTHOLOMY: Sure. Yeah. It's a perfect  
24 opportunity. In particular because if you take the federal  
25 tax credit for solar, you're able to get the -- you're able

1 to include the costs of the panel in the tax credit. So you  
2 get a, you know, near 30 percent buy down on the cost, as  
3 well as access to a whole bunch of different financing  
4 streams through solar companies.

5 And so the combination of even a little bit of solar  
6 and electrification from a cost perspective for consumers in  
7 California is just a no-brainer. So it's a perfect -- a  
8 perfect way to deal with an electrical panel problem in a  
9 really creative and beneficial way.

10 MR. ROSALES: Thank you. Maybe we'll take one more,  
11 a third and final question.

12 Brian, do you got one last question?

13 MR. SAMUELSON: Yes. This one is from Felicia Smith.  
14 This is a question for Aimee.

15 How many people have participated in the Workforce  
16 Development Program thus far, and what was the feedback from  
17 the participants?

18 MS. BAILEY: Yeah. Thank you very much for the  
19 question.

20 So for that particular program, it's currently being  
21 launched. And so it's in response to COVID. We had board  
22 approval at their April board meeting for the \$10 million in  
23 funding, but we had just brought back details of this program  
24 to our board in the May board meeting. And so they just  
25 approved it like last week.

1           But we've been concurrently already working on  
2 launching it. The plan is to launch it in very early June.  
3 The level of participation that we're kind of budgeting for  
4 is around a couple thousand and we also have some contingency  
5 funds. And so I'll be able to give more information about  
6 how that program is received within a couple months.

7           But right now we've been working with labor,  
8 community colleges, a variety of different building decarb  
9 experts on the development of the curriculum and, you know,  
10 teeing up communication on enrollment for that. So we have -  
11 - we're pretty optimistic about how that will go.

12           Thanks.

13           MR. ROSALES: Thank you, Aimee.

14           Well I'm going to wrap up there. I want to remind  
15 everyone that's on the --

16           COMMISSIONER MCALLISTER: Eddie, can I -- this is  
17 Andrew McAllister. I just want to jump in.

18           I guess, is there any plan for dealing with questions  
19 that we were not able to get to that people have sent in? In  
20 terms of, you know, getting them into the docket maybe, or  
21 getting some responses or facilitating some responses to  
22 that?

23           MR. ROSALES: Yes. All of the above, Commissioner.  
24 So we -- one, the WebEx is being recorded. Second, the WebEx  
25 is being transcribed. Third, we have a public comments and

1 question session that's a little bit longer at the end of the  
2 Webinar today. So, obviously we're not going to be able to  
3 field all the questions during the panels, especially  
4 depending on the volume of questions and the time we got.  
5 But we will get to all the questions, much more of the  
6 questions and hopefully all of them by the end of the Webinar  
7 today.

8           COMMISSIONER MCALLISTER: Great. Hopefully all of  
9 them and if we don't get to all of them, I'd like at least  
10 register them for the record that people who are  
11 participating and sending in questions. And that way it'll  
12 start the threads at that point.

13           MR. ROSALES: Duly noted.

14           COMMISSIONER MCALLISTER: Thanks a lot.

15           MR. ROSALES: So I got to remind everyone of that  
16 again that we do have a reserved public comment and that's  
17 also not only for comments, but also for questions at 2:30  
18 and we have 45 minutes reserved there. So we will go back to  
19 questions that we weren't able to field during the panels or  
20 questions that you have at the end of the day. We will try  
21 to address them.

22           Some of our panelists might not be around for the  
23 full day. Keep that in mind if there are questions that are  
24 for a specific panelist. So we will -- we will do our best  
25 to try to facilitate getting those questions and answers.

1 Those questions over to the panelists and getting answers and  
2 responses back to everyone.

3           So with that, I'm going to start closing this panel.  
4 Again Aimee, Julia, Meghan, Panama, thank you for your time.  
5 Thank you for sharing your expertise and your program  
6 experience with everyone here today. Your comments and your  
7 insights are now part of the Building Decarbonization record  
8 and it's going to be very helpful to this assessment. So  
9 again, I really appreciate that.

10           Jennifer, if you are on the line, you -- we can pick  
11 up from here and then transition to the next panel.

12           Jennifer, you might be on mute. So I want to just  
13 queue up Jennifer and Tiffany, and the panelists for the  
14 Multifamily Building Sector Panel.

15           MS. NELSON: Great. Thank you. Thank you, Eddie.

16           I want to reiterate what Heriberto said. We did have  
17 a number of chat comments. We are unable to get to them  
18 right now, but we do have a public comment period later this  
19 afternoon. I encourage people who were not able to have  
20 their question asked to re-ask it at that time.

21           And with that, I will pass it over to Tiffany Mateo  
22 who will be moderating the next panel on Multifamily  
23 Buildings.

24           MS. MATEO: Hi. Good morning. I want to do a sound  
25 check. Can you all hear me?

1 MS. NELSON: Yes.

2 MS. MATEO: Okay. Hi. My name is Tiffany Mateo and  
3 I am part of the Benchmark and Equity Unit in the Efficiency  
4 Division at the California Energy Commission. I work with  
5 Eddie and Jen.

6 Today I'm pleased to be moderating the Multifamily  
7 Building Sector Panel. We have three panelists joining us  
8 today with experience in building decarbonization programs in  
9 the Multifamily Building Sector.

10 Srinidhi Sampath Kumar from the California Housing  
11 Partnership. Katie Wu from Gridworks. And Leah Pertl from  
12 the Sacramento Municipal Utility District, or SMUD.

13 So we'll hear presentations that were prepared by the  
14 panelists. I'll do a quick introduction on each of them  
15 before they do their presentation.

16 Srinidhi Sampath Kumar is a sustainable housing  
17 policy and program manager at the California Housing  
18 Partnership. She joined the California Housing Partnership  
19 in 2018. As a sustainable housing policy and program  
20 manager, she leads policy initiatives and helps design and  
21 implement clean energy programs that impact low-income  
22 Californians by engaging with affordable housing property  
23 owners and community-based organizations.

24 Along with Coalition partners, she advocates for  
25 equitable energy efficiency and building decarbonization

1 policies that will decrease the (indiscernible) incentive and  
2 improve resident health and comfort. She leads the  
3 partnership Green Rental Homes Energy Efficiency Network, or  
4 GREEN, comprising of affordable housing developers across  
5 California.

6 Prior to joining the partnership, Srinidhi worked  
7 with Marin Clean Energy in San Rafael, where she spearheaded  
8 the design, launch, and implementation of the Low-income  
9 Families and Tenants, or LIFT, pilot program. Srinidhi  
10 received her masters of City Planning from the University of  
11 California, Berkeley.

12 So now I'll pull up the slides for the presentation.

13 MS. KUMAR: Hi everyone. Thanks for the  
14 introduction, Tiffany.

15 I want to thank CEC for the opportunity to share some  
16 of our findings on this topic. I also wanted to thank this  
17 morning's panel, which was really exceptional, and I'll be  
18 acquiring some of those recommendations that were shared  
19 before.

20 Before I start, I want to quickly introduce the  
21 California Housing Partnership. We are a nonprofit with our  
22 mission to create and preserve affordable and sustainable  
23 homes for Californians with low incomes by providing  
24 financial and policy solutions to nonprofit and public  
25 partners. We also help implement the solar and multifamily

1 affordable housing, and Multifamily Low-income Weatherization  
2 Program, and are part of the California Energy Efficiency for  
3 All Coalition.

4 Next slide.

5 I want to start by providing a really high-level  
6 landscape of the district of Multifamily Affordable Housing  
7 in California. We do a lot of data research in our  
8 organization. And most of what I'm presenting today are from  
9 those data.

10 On the new construction side we need about 1.3  
11 million affordable rental homes to meet pre-COVID-19 demand.  
12 And those figures we think will be increasing over the year.

13 Here in this slide we have data from our Affordable  
14 Housing Preservation database. Over 30,000 affordable rental  
15 homes are at risk of converting to market trade in the next  
16 ten years. Of these, about 9,000 homes, almost 28 percent  
17 are at risk of converting to market trade in the next year.  
18 And on the left we can see the historic loss of affordable  
19 rental homes by ownership type between '97 and 2019.

20 And in the graph, you can see that there is HUD and  
21 LIHTC. HUD is Housing and Urban Development, and LIHTC is  
22 the Low-Income Housing Tax Credit. And that's one of the  
23 significant source of funding for California rental homes.

24 We also did an analysis of the pandemic triggered  
25 reduction in tenant rent payments. And affects companies for

1 months without any address by the federal or state  
2 government. It will likely push around 3,500 developments  
3 into insolvency.

4 Next slide.

5 State tax credits go really quickly. Only about 40  
6 properties get constructed every year, so production's  
7 already really low. And in this graph, we did an analysis  
8 and we saw that the Low-Income Housing Tax Credit production  
9 and preservation in California has declined by about 13  
10 percent overall from 2016. And this is largely due to  
11 federal tax reforms.

12 The reason why this is really important is because  
13 these properties are subject to the highest form of  
14 regulation with severe protection on rent, rent increases and  
15 evictions. And so whenever we're planning for programs, it's  
16 easier to implement several of these in the address for  
17 affordable housing and seeing how that goes without severe  
18 rent restrictions.

19 On the preservation side alone, if done right,  
20 building decarbonization presents an exceptional opportunity  
21 to preserve this vast talk of affordable housing, lower  
22 operating expenses and also providing healthier and more  
23 sustainable housing for residents.

24 Next slide.

25 I wanted to share this quote which is actually from

1 an architect. So it was shared to the architect from a  
2 developer. And it says, I literally have no additional funds  
3 to improve energy efficiency or even to buy the solar  
4 equipment we show now. So if this results in any additional  
5 cost at all, it's not achievable. I'm sorry, but the focus  
6 of this project is 100 percent on first cost. And I really  
7 do not have the time or the bandwidth to try to change the  
8 funder's focus on first cost to savings over time.

9           This is on new construction, but this largely sums up  
10 most of the challenges that we've heard from developers and  
11 the other stakeholders. I will go into some of them a little  
12 more detail and offer some recommendations that could help  
13 potentially overcome them.

14           Next slide.

15           So the first challenge we're seeing is just around  
16 the developer's size and experience. Developer size  
17 influences their staff capacity, their experience navigating  
18 programs. Large developers usually have a more dedicated  
19 staff working on sustainability programs. So they have the  
20 staff who can navigate all these different programs.  
21 Coordinate with the timing and really just property manage  
22 the whole thing.

23           And they also have portfolio wide sustainability  
24 initiative. So around like zero net energy, zero net carbon  
25 goals come usually from those initiatives.

1           Next, it is easier to have a ZNE goal that is  
2 feasible for a low-rise property, than from a developer high-  
3 rise building. And this is something we've seen through data  
4 analysis. Like a lot of reports have shown this.

5           The next one is also largely true for new  
6 construction. Where developers with property more than one  
7 jurisdiction need to get -- navigate all these different  
8 requirements. There are so many new reach codes. That's  
9 really great, but these developers will have city -- projects  
10 in different cities need to navigate each of those reach  
11 codes, which are really different now. And they really do  
12 not have the assistance to help them navigate this.

13           Maintenance staff are also very new to this  
14 technology and have little to no experience managing these  
15 equipment. Often these decisions about going zero net energy  
16 or zero net carbon are made by the development team. It is  
17 almost twice removed from the actual property management  
18 staff who are maintaining these equipment and when something  
19 goes wrong or when a resident complains, they are the ones  
20 who actually need to troubleshoot the issue on the ground.

21           So often small developers hire third-party companies  
22 to manage their properties. So again, these staff -- these  
23 staff are also not really trained in maintaining these  
24 equipment. So when they're thinking about building  
25 decarbonization, just transition and work with staff

1 development, this is often a sector that's overlooked. And  
2 so there needs to be some priority in training these staff.

3           Again, this was highlighted before, but there are not  
4 many contractors who are familiar with this technology. From  
5 the housing side, some programs also have really strict  
6 bidding requirements so they may have to go after multiple  
7 bidding requirements. And sometimes they're just not able to  
8 produce that many bids.

9           The decision to decarbonize need to -- needs to be  
10 made very early and often designers and engineers are  
11 unwilling to move forward with this and are simply  
12 (indiscernible). Some engineers are also worried about the  
13 impact of tax credit timelines. And this is something that's  
14 come up before where the developers want to go ahead and do  
15 zero net energy work in the property but really are finding  
16 it hard pressed to convince their engineers. So developers  
17 sometimes need to pay a premium to hire third-party  
18 consultants who could then help the rest of the team to  
19 pursue this goal, which again, pushes up their project cost.

20           This was mentioned before, and I wonder  
21 (indiscernible) is just early adopters pay a premium and  
22 they're taking significant risk in terms of getting a team  
23 together and having these new systems involved -- sorry,  
24 installed. Most of these systems have not been on the market  
25 and so they do not really have a history. And all developers

1 are almost on a trial and error phase with this.

2 Next slide.

3 MR. ROSALES: Hi, this is Eddie.

4 Srinidhi, I just want to do a slide check. Are we --  
5 can you see the slide? Are we on the right slide? We had  
6 comments that we might be behind on one slide.

7 MS. KUMAR: Yeah. This is the right -- yeah, this is  
8 the right slide.

9 MR. ROSALES: Okay. Thank you.

10 MS. KUMAR: Just continuing on the equipment  
11 challenges. Many developers highlight central domestic hot  
12 water and laundry systems as some of their biggest challenges  
13 when it comes to fuel switching. Although more recently most  
14 issues we are hearing about are associated with central  
15 domestic hot water heaters.

16 Resiliency. I know this came up in the morning  
17 again. And the conversation about storage really spurred  
18 after last year's public safety power shutoff. And it's  
19 really looming large with this fire season, which may  
20 actually coincide with this pandemic. Many affordable homes  
21 houses seniors, so the need for battery storage has been a  
22 huge concern. However, the cost associated with these  
23 systems have also been really significant. These are  
24 critical investments that are largely averted because they  
25 remain cost prohibitive. But also there's lesser technical

1 know-how. But just lack of physical space in terms of  
2 addressing this.

3           There are also issues around system sizing. And one  
4 thing that's often talked about in this context is also the  
5 cost of infrastructure updates and transformer upsizing.  
6 And, yeah, this is something most programs need to address as  
7 well. And one thing that hasn't really come up is that  
8 affordable housing developers who are trying to fuel switch  
9 existing properties still (indiscernible) and backup gas  
10 equipment. And that's mainly because of cost of having a  
11 backup electric equipment. And that's something most funding  
12 programs need to address as well. So what happens to backup  
13 equipment, and what -- how do we really think about that when  
14 we're talking about fuel switching existing buildings.

15           Next slide.

16           So on the recommendation side, I know this has come  
17 up several times, and this has been raised by many, and we  
18 really appreciate the CEC working on the issue of updating  
19 their modeling software. But I do want to provide more  
20 context as to why this is really relevant. Several housing  
21 programs like the Tax Credit Allocation Committee and the  
22 California Debt Limit Allocation Committee reward going a  
23 certain percent above Title 24, as a means to make their  
24 applications more competitive. So we've been hearing from a  
25 few developers who are trying to comply with this but are

1 finding it to be a real challenge. Many developers are also  
2 needing to pay a consultant to help them find workarounds and  
3 that, again, adds to their project cost.

4           This leads me to my next point on having CEC and many  
5 of these housing agencies coordinate so that these challenges  
6 could be addressed at a higher level, therefore not really  
7 impacting the developers who are actually trying to fuel  
8 switch. We are planning an Affordable Housing  
9 Decarbonization convening this fall, and one of our goals is  
10 to bring these agencies together through that convening.  
11 Since we're also seeing a stronger relationship between  
12 building decarbonization and positive health outcomes, there  
13 is -- there is a need to be really creative about this and  
14 tap into the sources of health agencies.

15           And I want to highlight MCA's LIFT pilot here because  
16 we were previously offering some health initiatives through  
17 the Green and Healthy Homes Initiative that addressed issues  
18 like mold in the property. And I know currently they're  
19 working with the County of Contra Costa Health Department to  
20 see how they can target a small prevention, and really target  
21 those households to prioritize energy efficiency investments.

22           On the funding side, there definitely needs to be  
23 more reliable and stable funding for programs that actually  
24 has a (indiscernible) for reducing GHG emissions. The  
25 existing Multifamily Loan Carbonization Program has provided

1 over 12,000 loans to renter households with comprehensive  
2 energy upgrades and has reduced bills by 30 percent on  
3 average. 68 percent of live or multifamily participants also  
4 received heat pumps. But the program currently has a wait  
5 list of 18,000 households and all of them are in  
6 disadvantaged communities.

7           Some existing and new programs that are being  
8 designed or developed should also have explicit  
9 (indiscernible) for affordable housing developments. We're  
10 already hearing from developers about how they have not been  
11 able to tap into the dollars provided by the (indiscernible)  
12 incentive program and will be talking that closely to see how  
13 that's been missed out.

14           I also wanted to highlight what Julia had mentioned  
15 this morning on community engagement and successful program  
16 implementation. It's really important to offer streamlined  
17 programs that are easy to access and to be able to  
18 participate in. We've highlighted upfront payments as a  
19 strategy that could spur these projects, even before the  
20 pandemic. And be happy to see CCAs likes some of our clean  
21 power, early integrate this into their program design  
22 framework.

23           The last two, I want to find out -- I understand  
24 there are several cost analyses studies that have already  
25 been conducted. But we'd specifically like pilot and

1 decarbonization for the sector in both new and existing  
2 buildings to really analyze what the real cost caps are.  
3 Because right now we are seeing multiple data points, both  
4 from the developer sites, and it's few and far between. Not  
5 many developers are actually doing -- have the data to show  
6 any lifecycle cost. But a lot of developers are interested  
7 in seeing that data for themselves to make those decisions.  
8 So there needs to be a mechanism for also cost information to  
9 be shared between developers.

10           And the last one. This was specifically proposed as  
11 part of the L.A. City decarbonization ordinance where  
12 affordable housing -- where they realized that affordable  
13 housing financing situation is really unique. So studying  
14 lifecycle costs associated with the sector will really help  
15 understand the feasibility.

16           Next slide.

17           Panama spoke in length about the need for consumer  
18 education and creating value proposition, and I really cannot  
19 stress the need for it enough. I want to focus on two of  
20 these.

21           One is the technical assistance to affordable housing  
22 providers to be decarb ready. This is something that the  
23 East Bay Clean Energy is offering along with the Association  
24 of Energy Affordability, and that's a really good model that  
25 we can all expand upon.

1           The other one is lender training. Lenders are really  
2 crucial to any affordable housing development and have a  
3 significant role to play in project development. Most  
4 lenders are either unaware or new to the technology so  
5 helping lenders really understand cost to savings over time  
6 is a very crucial part of this training and moving into  
7 building decarbonization strategies.

8           So I want to close up by saying just this pandemic  
9 has really exposed a lot of inequities. There is a lot of  
10 pressure on affordable housing developers to match cost. And  
11 there is definitely a stronger need to protect resident from  
12 unintended cost burdens. Building decarbonization policies  
13 must really empower affordable housing residents and  
14 providers. There's a need for more funding, flexibility, and  
15 a phased approach without compromising the end goal of  
16 decarbonizing affordable homes.

17           I want to quote Chair Hochschild and Julia Hatton put  
18 it this morning. It's important to ensure that low-income  
19 homes are healthy and comfortable now more than ever. And we  
20 need to start that work by putting people first through this  
21 process.

22           Thank you.

23           MS. MATEO: Okay. Thank you.

24           Next up we have Katie Wu who's the director of  
25 Gridworks.

1           Katie's experience of building decarbonization is  
2 rooted in a past life as an energy efficiency analyst and  
3 supervisor at the CPUC where she oversaw the development of  
4 energy efficiency savings value. Since joining Gridworks in  
5 2018, Katie has collaborated with stakeholders to better  
6 understand the policy, technical, and market context for  
7 building decarbonization.

8           She worked at the Building Decarbonization Coalition.  
9 The research agenda to help guide - oh, I'm sorry. Katie  
10 facilitated the development of a roadmap to decarbonize  
11 California buildings. Her research agenda to help guide  
12 building decarbonization RND, and the Decoding Grid  
13 Integrated Buildings Report which helped to frame the  
14 potential impact of building decarbonization on local  
15 infrastructure.

16           Thank you, Katie.

17           MS. WU: Thanks very much for the introduction,  
18 Tiffany. I do just want to check that everyone can hear me  
19 okay.

20           MS. MATEO: Yes.

21           MS. WU: Okay. Great.

22           Thank you to the CEC and to all the panelists today  
23 for having me here. It's my pleasure to be presenting on  
24 technical challenges of decarbonization retrofits in  
25 multifamily buildings.

1           A little bit about Gridworks. Our mission is to  
2 convene, educate, and empower stakeholders working to  
3 decarbonize electricity grids. And we do that in four ways.  
4 First, by identifying high-value challenges to  
5 decarbonization. Second, by convening stakeholders in a  
6 neutral space and facilitating conversations to identify  
7 solutions. We then publish those solutions, and in some case  
8 support the implementation. And following those publications  
9 and successful solutions, we adapt those solutions to new  
10 markets.

11           And we're doing a lot of work in California. There  
12 are a few snapshots of some publications that we've done in  
13 partnerships with the Building Decarbonization Coalition, as  
14 well as Silicon Valley Clean Energy. We're also working in  
15 Oregon, Hawaii, and Colorado on these pressing issues.

16           Just a quick overview of who we are. Some of these  
17 faces may look familiar to everyone. We're led by Matthew  
18 Tisdale is our executive director, supported by senior  
19 fellows Mike Florio and Eric Martinot. Randy Sandoval is our  
20 new fellow out in Colorado. And Deborah Shields, our  
21 director of Operations and Communications. We have great  
22 project managers in Mac Roche and Rehana Aziz. And we're  
23 supported by Hector Tavera as a distribution grid analyst.

24           So the challenges for decarbonizing multifamily  
25 buildings have been touched on by a lot of the presenters

1 today so I'll try not to be too repetitive here. But I think  
2 given the number of stakeholders in multifamily buildings,  
3 there is greater complexity.

4 Srinidhi touched on some of the challenges for  
5 tenants, including lack of control over appliances.  
6 Uncertain bill impacts if you may not be on the most economic  
7 electricity rate. And potential for displacement from a  
8 retrofitted unit. If a property manager or a landlord does  
9 invest in upgrading a multifamily unit, there's potential  
10 that the rent will then increase and tenants may be displaced  
11 as a result.

12 For property managers, though, there is a lack of  
13 monetary benefit to decarbonize if they're not the ones  
14 paying the electric bills. So that balance of how to  
15 encourage decarbonization but also make it worthwhile for  
16 those property managers is a challenge for all of us to be  
17 considerate of.

18 As Srinidhi mentioned, there's a lack of high-demand,  
19 high-capacity dryers for shared laundry rooms. And  
20 decarbonization retrofits are complex projects. They require  
21 contractors to be in common spaces and in units. They can  
22 take a while to implement and become disruptive for both the  
23 property managers and the tenants. And as Srinidhi touched  
24 on, property managers have a wide variety of responsibilities  
25 so it can be really challenging to take on a complex project

1 in that space.

2 For contractors, each project is unique. Each  
3 multifamily building is different and so there's a lack of a  
4 simple, repeatable, retrofit project that contractors can  
5 implement to help support those high road jobs that Julia and  
6 others have talked about.

7 And as Panama talked about, the lack of availability  
8 of appliances in the marketplace can make it challenging as  
9 well. If someone is in an emergency replacement but they  
10 need to wait a couple of weeks in order to get the right  
11 equipment, it may be easier to go with incumbent  
12 technologies. So certainly shoring up the supply chain is  
13 critical to decarbonization.

14 And the last challenge that I'll mention and the one  
15 that my recommendations primarily focus on is this issue of  
16 impacts to electrical infrastructure and the grid, which  
17 several panelists had brought up this morning. The capacity  
18 and energy demand increases that can result if  
19 decarbonization is pursued through electrification can have a  
20 significant impact on, not just electrical panels but also  
21 transformers connecting the building and distribution system  
22 infrastructure in the area.

23 This figure is from a paper that Gridworks published  
24 in partnership with the Building Decarbonization Coalition on  
25 decoding grid integrated buildings. In the literature review

1 in preparing for that paper, I found that there is not a lot  
2 of research on multifamily buildings, and the panel  
3 conditions in those buildings. So we do identify that as a  
4 priority research need.

5 But there are some lessons learned from single-family  
6 buildings that we can apply to multifamily as well.  
7 Primarily that in older buildings that have not been  
8 retrofitted, it's more likely that a panel will need to be  
9 updated to accommodate increases in demand. Even if a panel  
10 has been upgraded, there may not be adequate capacity to  
11 accommodate electrification if that wasn't planned for in the  
12 initial panel upgrade. And even if the panel has adequate  
13 capacity and enough breaker space to accommodate  
14 electrification and solar, wiring within the building may  
15 need to be upgraded as well to serve those end uses. So  
16 there are a number of issues related to panels, and of course  
17 this feeds into impacts to transformers and distribution  
18 system as well.

19 So on to the recommendations. As Commissioner  
20 McAllister mentioned this morning, there are a number of  
21 policy areas and programs that overlap with decarbonization.  
22 And so there's a real opportunity to leverage existing  
23 programs, as well as new funding for pilots and incentives to  
24 make multifamily buildings electric ready. Along the lines  
25 of the Future Fit Program the SPEC is running to provide low

1 emissions and low amperage appliances to multifamily  
2 buildings.

3           Commissioner McAllister touched on these this  
4 morning, but the CEC is overseeing the Build Pilot as part of  
5 SB 1477 implementation. The CPUC's Energy Savings and  
6 Assistance program recognizes health, comfort, and safety  
7 benefits. And that may be able to be leveraged to  
8 incentivize fuel switching in multifamily buildings.

9           And the CPUC's Solar on Multifamily Affordable  
10 Housing Program has an opportunity to ensure that panels are  
11 the right size to accommodate potential future  
12 electrification as they're installing solar on multifamily  
13 buildings.

14           Several panelists have mentioned the need for  
15 customer support. And this recommendation is rooted in  
16 developing a customer centric platform to support building  
17 decarbonization. A one stop shop that customers can come to  
18 identify their project possibilities, better understand costs  
19 of this projects, potentially link them up with contractors  
20 as well.

21           The CEC and CPUC both have responsibilities in this  
22 area where the CEC can, through AB 3232, implementation  
23 develop that customer facing project guidance platform in  
24 consultation with contractors and labor representatives. And  
25 both agencies should be consulting with housing organizations

1 to better understand tenants' needs, and property managers'  
2 capabilities to install building decarbonization end uses.  
3 Srinidhi spoke to this as well, and I can't emphasize enough  
4 how partnerships are really going to be key to reaching our  
5 decarbonization goals.

6           And we talked a little bit about load management as  
7 well. The CEC does have its load management rulemaking,  
8 which may be able to consider use cases for multifamily  
9 buildings in leveraging those with grid integrated resources  
10 and implementing load management strategies to smooth the  
11 demand on the grid.

12           And the CEC and CPUC, in collaboration with  
13 stakeholders, should study and assign quantitative value to  
14 the reliability of virtual power plants to manage load.  
15 Gridworks does have a couple of publications on this in  
16 partnership with Silicon Valley Clean Energy. We developed  
17 an options analysis for virtual power plants which range from  
18 time of use rates to load shift product offerings. The CPUC  
19 has also had a working group on load shift which developed  
20 some options for how load can be managed from grid integrated  
21 buildings and technologies.

22           And recently, Gridworks facilitated a technical  
23 working group on behalf of SMUD to better understand the  
24 value of solar and storage. And within the report for that  
25 working group, there are recommendations on how to approach

1 this valuation exercise. So virtual power plants can be a  
2 real asset to managing load from increased electrification.

3           And this final recommendation is probably the  
4 wonkiest recommendation on updating load calculation  
5 approaches. As I understand the National Electrical Code  
6 drives safety standards for panel sizing. And the  
7 interpretation of the National Electrical Code and its  
8 application to the California Electrical Code is what local  
9 government, permitting offices, and building inspectors use  
10 to determine whether a panel is the correct size for a  
11 building.

12           And generally that's based on an arithmetic approach  
13 of just adding up the demand from each of the appliances  
14 within a building. But given load management technologies,  
15 given load flexibility opportunity, there may be an  
16 opportunity for the CEC to work with the California Building  
17 Standards Commission and local governments to identify other  
18 approaches to load calculation. And how the peak demand is  
19 not necessarily everything running at the same time. At the  
20 same time, the CPUC can work with load serving entities to  
21 clarify and update base load assumptions to ensure that  
22 efficiency standards are accurately considered.

23           And lastly, the CEC and CPUC can consult with the  
24 Governor's Office of Business and Economic Development. They  
25 put together a permitting guidebook for electric vehicles,

1 and a similar one can be developed for building  
2 decarbonization to clarify load calculation approaches that  
3 can be accepted by local government permitting offices, and  
4 provide project examples for developers and customers to  
5 better understand.

6 Thank you all very much for your time and attention  
7 today. Gridworks contact information and my contact  
8 information is included. And there are also a few resources  
9 that I mentioned today and that others have mentioned that  
10 can help us to better understand opportunities and challenges  
11 in multifamily buildings.

12 MS. MATEO: Thank you, Katie.

13 Next, we have Leah Pertl. She's the supervisor of  
14 commercial programs with SMUD. Leah manages, directs, and  
15 provides oversight for portfolios SMUD commercial intensive  
16 programs that supports energy efficiency, including  
17 transportation electrification measures for commercial  
18 customers class market segment.

19 Her team has been instrumental in working with  
20 commercial customers and industry stakeholders to support the  
21 short and long-term goals of those in decarbonization within  
22 the Sacramento region. She was development and  
23 implementation (indiscernible) and transportation  
24 electrification intensive across the portfolios while also  
25 providing utility resources that educate commercial consumer

1 on whole market segment electrification solutions  
2 incorporating grade timing resources that ultimately support  
3 their business goals.

4 And I will pull up the slides.

5 MS. PERTL: Thank you.

6 Quick sound check. Can you hear me?

7 MR. SAMUELSON: Yes, we can hear you.

8 MS. PERTL: Excellent. Okay. Thank you.

9 Let's see here. Yes, so I oversee a suite of energy  
10 efficiency and commercial electrification program that really  
11 go across market segments. Everything from small  
12 (indiscernible) customer segments to large industrial  
13 commercial customers for a variety of technology.

14 So as we move into building electrification and  
15 transportation electrification, we're actually able to embed  
16 those measures into many of our existing programs and launch  
17 new products that are primarily focused on electrification  
18 measures.

19 So today we'll talk a little about those  
20 electrification programs that SMUD is currently offering.  
21 I'm pleased to hear that many other things that we talked  
22 about earlier that were challenges that we had -- SMUD had  
23 looked at and recognized and were issues and needed to be  
24 embedded. We live in the program designed so we're all on  
25 the same path, that's pretty exciting to see.

1           Next slide.

2           Thank you. So a little bit about SMUD, although many  
3 of you know us. We are a not for profit utility. We've been  
4 serving in the Sacramento region since 1946 and we're now the  
5 sixth largest community owned not for profit utility within  
6 the country. So we're owned by our ratepayers so that means  
7 that we have a board. Right? And that means that they are  
8 very active in our community and it's likely as active as  
9 well.

10           So there isn't a day that goes by that we don't get a  
11 request from a customer about how we can help push the  
12 needle. So it's really important for us to continue doing  
13 that, especially as California has an ambitious environmental  
14 goal. And to achieve our electrification goals, we're really  
15 going to need to look at ways that we can electrify water  
16 heating, space heating, and cooking equipment as we expect  
17 that those measures will help us to reduce greenhouse gas  
18 emissions from residences by up to approximately 60 percent,  
19 not only giving our region environmental savings but also  
20 cost savings for our customers.

21           Next slide.

22           There we go. SMUD -- there we go. Thanks. SMUD  
23 does plan to transform the region. We are making bold  
24 investments over a 20-year time span for maximizing our local  
25 renewables as well electrification. But that's not just

1 building electrification but transportation. So we really  
2 have to look at it from a holistic perspective. And with  
3 that, our goal is to be -- net carbon zero by 2040. I mean,  
4 that's a huge goal.

5           To get there, though, we have two different paths.  
6 Right now we're currently offering two programs, our Smart  
7 Home program and our Multifamily program. And our Smart Home  
8 program I'll talk about briefly. It incentivizes builders to  
9 adopt all-electric construction practices. And it ensures  
10 that the home itself once constructed produces less carbon  
11 with time until it becomes a zero emission home by 2040.

12           Next slide.

13           Now what you're looking at here is really a grid that  
14 talks about why it's important to participate in carbon  
15 reduction. Our electric -- excuse me, our electricity supply  
16 emissions that serve our retail footprint is the top  
17 declining line there. Our attributable building  
18 transportation decarbonization reduces all of those emissions  
19 in those different segments down to zero. You can see the  
20 building decarbonization segment, the vehicle attribution as  
21 well, and then what the net is by 2040.

22           So we have a lot of work ahead of us to get there.  
23 We (indiscernible) about a quarter to a third of the total  
24 emission reduction over that 20-year period from all of the  
25 electrification efforts. Now is it all from Smart Home? No,

1 it's not. We really only expect to have a 15 percent market  
2 share over a three-year period where we'll have some impact  
3 but it's driven by a high incentive rate and we expect to  
4 trail our incentive rates down over time because at some  
5 point we expect code to have a requirement. And we know  
6 that's coming soon for new construction to be all-electric.  
7 So we're really trying to drive that needle forward sooner  
8 rather than later.

9           Next slide.

10           Now what you see here, and I know it's a busy slide  
11 so when you have a chance to read through it later, it'll be  
12 to your benefit. We offer two paths within the Smart Home  
13 program for customers. They just kind of -- you've all said  
14 and we all know that there are some significant barriers to  
15 get builders, developers on board. And so with the two  
16 pathways, we've actually found significant interests.

17           All-electric provides obviously the most maximum  
18 incentive. And right now, that current maximum incentive is  
19 up to \$7,000. Now mind you, this program serves single-  
20 family and multifamily new construction. Really important to  
21 know.

22           For multifamily, the incentive is significantly less  
23 with up to \$1750 per unit. And that includes a menu driven  
24 solution, heat pump HVAC, heat pump domestic hot water,  
25 induction cooktop. It also assumes that on the all-electric

1 that it is EV ready. Now on the multifamily side, we don't  
2 have a requirement for EV ready, just have to comply with  
3 code which means that it has to be indicated on the site  
4 plans or the civil plans. It's more they anticipate their EV  
5 to be in the future, if they're not planning to do it  
6 immediately. Although we do have opportunities within this  
7 program to leverage electric vehicle charging installation  
8 and incentive for that as well.

9           So we actually have many opportunities to help them  
10 with EV charging, heat pump (indiscernible), electric dryers,  
11 HVAC, and so on. So there's a lot of opportunity to  
12 customize the program design with each builder and it meets  
13 the needs of their customer base. So people that are buying  
14 their homes. So that's really important to know. As well  
15 within the market segment that they're -- they're trying to  
16 serve within our community.

17           Next slide.

18           Now part of this means education, right? So for our  
19 builder support program, we offer a number of ways to do  
20 that. We can put out front their digital ads or cobranding.  
21 We have model home handouts that are customized and cobranded  
22 for them. Talk about education -- this is really education  
23 that goes toward future buyers that the builder can then  
24 insert into their, you know, packages for their potential  
25 customers. So it educates the clients -- the customers who

1 finance and purchase those homes so later on they have that  
2 information to refer to.

3 We also do it through social media. We have sales  
4 training and event support when they're having open houses  
5 and watch parties for their new products. So it's really  
6 important to know that upfront we really want to make sure  
7 that we engage with the builders, we engage with their sales  
8 staff, and we engage with their customers at the very  
9 beginning when they're out there educating their customer  
10 base.

11 Next slide.

12 Now this is where we're at so far. We're pretty  
13 excited about this. Through 2022, we have 36 of the 56  
14 developments within our territory currently in our pipeline  
15 with over 1800 single-family units that is -- single-family,  
16 I'm sorry, and mixed -- multifamily residential units in here  
17 as well. So as you can see the breakout, through 2022, we  
18 have \$6.2 million reserved.

19 Now even with current COVID restrictions, essential  
20 workers are continuing. We are not seeing a significant  
21 drop-off in construction. So pretty excited about that.  
22 Now, you know, if the economy changes significantly, we may  
23 see some drop-offs, right? But we have smaller boutique  
24 builders, other projects that are coming in and we expect  
25 that those will fill that pipeline.

1           As you can see, though, with the pipeline through  
2 2025, we know what's coming because it has to come through  
3 our new service or replanning planning process. So we can  
4 see up ahead, hey, what kind of projects are coming through?  
5 And as a result of that, one of the things that we did  
6 through this program and through our building electrification  
7 and transportation electrification efforts is to work with  
8 our replanning groups and say okay, what's a new requirement  
9 that we need to have in place so that builders will meet what  
10 our low capacity requirements are. And one of those was to  
11 set up a plan where for every home that's all-electric that  
12 comes through, they must be able to support a transformer for  
13 every ten homes.

14           So now that new requirement is based off of an all-  
15 electric load calculation per site or per subdivision.  
16 Right? And so -- so when they submit that for an all-  
17 electric, as long as they're meeting those requirements, then  
18 we know that whatever measure they choose, they'll be --  
19 they'll -- they'll -- they'll not only be compliant with the  
20 program but they'll be compliant with our new construction  
21 processes. In the past, they would have gone through a mixed  
22 fuel, would have assumed gas and electric.

23           And so with these new preplanning processes that we  
24 can get it into a program design, we've also been able to  
25 take that and say okay, how does that apply towards other

1 programs? And so -- such as a multifamily retrofit program  
2 which I'll talk about briefly in just a moment.

3 And so, you know, we're pretty excited about the  
4 success of this program, we continue to see builders engage  
5 with it every single day. They call us and ask us more and  
6 more about how they can participate, what are the measures  
7 could they benefit from. And some of the things that we look  
8 at is obviously battery storage is one of them.

9 We have to look at community solar. I think we're  
10 still waiting on a few things SMUD was able to get to work  
11 with the CEC with our solar shares program. And so we're  
12 excited to be able to partner with solar in our region to  
13 offer single-family homes and multifamily our neighborhood  
14 solar shares in the coming months and the years with this  
15 program.

16 And next slide.

17 And so now we'll talk about our multifamily program.  
18 What's really interesting, we've offered this program for a  
19 couple of years. And we've had variations in the past like  
20 many utility programs started off with energy efficiency.  
21 And in fact, it was really modeled -- the most recent  
22 (indiscernible) was really modeled off of (indiscernible)  
23 approach. You have total gas and electric site savings and  
24 then you -- we would provide an incentive specific to the  
25 energy efficiency, you know, a (indiscernible) per kilowatt

1 hour. Pretty simple.

2           And then we had bonuses for electrification. We  
3 realized that wasn't really going to help us with our goal.  
4 So we had to change the design of the program. So what's  
5 coming is we're going to be able to offer and we are offering  
6 an electrification incentives first. And we're going to  
7 offer it in this deemed way. So instead of having them go  
8 through the whole modeled approach, we're going to tell them,  
9 hey, up front (indiscernible) what your incentives are going  
10 to look like.

11           Now, who's been interested in it? We've had  
12 apartments, obviously, property managers, owners, and such,  
13 hotels. We've had dorms. There are a lot of different  
14 stakeholders within in a community we're very interested in  
15 doing, (indiscernible) to be easy. They'll make it hard for  
16 us. So the property manager and owner that doesn't have the  
17 resources to go out and pay an energy modeler but knows that  
18 they have to replace all of their hot water heaters because  
19 they are, you know, at the end of their lifecycle and they  
20 want to change their electric to induction cooktop. Keep  
21 that available, right?

22           So want to take a look and see what those options  
23 are. And then they also if they want to understand what the  
24 implications are if they go from gas to electric, we want to  
25 be able to provide them with our research and resources up

1 front. Now it isn't for market rate, we also offer low-  
2 income incentives for those qualifying multifamily sites.

3 So let's go to the next slide.

4 Now the second measure that we're looking at  
5 initially are heat pump HVAC, heat pump domestic hot water,  
6 and induction cooking. Now with multifamily sites we find  
7 many of (indiscernible) unitized specifically the heating and  
8 cooling, the induction cooking, obviously, is always  
9 unitized. But the domestic hot water, you just never know.  
10 It could be a centralized system within each building or it  
11 could for the entire campus, or it could be per unit. We  
12 never know until we get in there and start taking a look at  
13 doing a site walk. It's always interesting.

14 But our air and (indiscernible), our electrification  
15 are specifically for gas electric conversions in this area.  
16 And so we're pretty excited about offering that.

17 Next slide.

18 Now I said this earlier and we continue to see this  
19 is that electric panel upgrades (indiscernible). Many times  
20 the customers, they've had a gas hot water heater and now  
21 they've got to go in and say okay, well, it's -- good luck  
22 with 15-year lifecycle on the existing panel, we're going to  
23 have to upgrade it anyway. So this is an opportunity that we  
24 see that they can take advantage of to convert over, upgrade  
25 their panel to what the new load demand would be and then

1 take a look at the measures and say, okay, what could they  
2 take advantage of?

3 That also means, though, that there may be some  
4 additional engineering that has to be done, as well as some  
5 permitting support. So we're offering bonus incentives in  
6 that area because we know that the local agencies may be  
7 requiring additional -- some additional fees surrounding the  
8 actual electric conversion.

9 Now we're also leveraging our electric vehicle  
10 charging incentives for our multifamily customers. And,  
11 again, just like Smart Homes, we're leveraging our existing  
12 commercial no (indiscernible) charging and multifamily  
13 programs, inserting it right into the program design and then  
14 offering -- now this is the real kicker, this is a -- we can  
15 offer up to 25 percent match from low-income funds to our  
16 qualifying low-income customers.

17 And so we really want to find a way to support those  
18 customers that meet, you know, that had equity and, you know,  
19 some environmental disparity within our community and make  
20 sure that they're being supported as well.

21 Next slide.

22 Now who are these customers? Obviously building  
23 owners, property owners, managers, and tenants. But what's  
24 unique to this program, and I think I heard earlier from  
25 Srinidhi. She was talking about -- I mean, earlier this

1 morning about single-family with -- when we talked about  
2 engagement. This program specifically had a tenant  
3 engagement delivery program. And what that means is when we  
4 provide information to our customers because the tenants are  
5 our customers as well. Whether it is from a master meter  
6 delivering that, where there's a single meter that gets  
7 charged to the property owner, but there's certain education  
8 components that can be provided to the tenants about how to  
9 use the system, right? How do you use the new HVAC  
10 thermostat? Right? Or, you know, what the expectations are  
11 with a new heat pump water heater? Now how do we do this?  
12 We do this through digital delivery. That's basic -- that's  
13 appropriate, I wouldn't do that for our senior population,  
14 but I might do that for a millennial group, right?

15           We could do that through apartment visits that are  
16 partnered through and scheduled with our low income and our  
17 tenant engagement team. And then we can still offer  
18 regionalized local community events, whether it's at the site  
19 or nearby for that tenant population. And again all of these  
20 are personalized and designed specifically for the population  
21 at that property.

22           Next slide.

23           No one for goal, really. Obviously, we  
24 (indiscernible) carbon reduction goal. But really you want  
25 to maximize all of the benefits that go along with it such as

1 indoor air quality, health improvement, tenant comfort.  
2 Those top -- those really are three top areas in which we can  
3 help tenants really buy in to the technology.

4           The energy savings will be an added benefit to it.  
5 Because also the energy and savings will come based on you.  
6 Right? So if you had a (indiscernible) unit that you were  
7 running constantly but it was never cooling and then they  
8 replace it, now it's running and it's working effectively.  
9 Well, if they cut it to their (indiscernible), they  
10 understand how to make sure they optimize their actual rate,  
11 then tenants become more engaged. They begin to learn the  
12 new behaviors that they need to employ to make sure that  
13 their continuing to seek energy efficiently while benefitting  
14 from the new technology. It's absolutely critical that we  
15 have that engagement with the tenants and the property  
16 management team.

17           Next slide.

18           Now with (indiscernible) incentive rates, I spoke  
19 earlier briefly about how it's going to be based on a menu  
20 driven solution. So this is after you would try to have a  
21 retrofit the entire site at 80 percent or more. Now we're  
22 saying look, we want to make sure this is easy for anyone to  
23 use. If they want to (indiscernible) a small number of units  
24 and then, you know, that way if they -- if they need to move  
25 a tenant to another site, you come back to that location once

1 it's retrofitted, then that's fine. They can do that. But  
2 we'll be providing a multiple number of incentives for --  
3 from air source heat pumps ranging from say \$600 per  
4 apartment to \$1500 for a residential storage hot water heater  
5 or even a central plant system serving multiple units.

6 And keep in mind that we really want to make sure  
7 that we're reaching large numbers of customers, so we do have  
8 to have a cap point. We helped cap it at \$150,000 per  
9 project. But that is for energy efficiency, plus we have a  
10 cap of \$150,000 per project for electrification. And then a  
11 \$25,000 cap for low-income incentives.

12 So technically, they could receive up to \$325,000 per  
13 site if they were to take advantage of all the opportunities.  
14 So we're pretty excited about being able to offer such a rich  
15 incentive and a more holistic incentive. And that's not even  
16 really including all-electric vehicle charging, dependent on  
17 whether they took advantage of that or not.

18 So lots of opportunities for them to pick and choose  
19 what managers work for their site and to make sure that  
20 tenants are really engaged and understand the value of the  
21 investment that they put into their property.

22 Next slide.

23 And for just a brief cap on our electric vehicle  
24 program. As I mentioned before, we leveraged the work that  
25 we do on our existing products. And currently we are

1 partnering with the CEC on the Sacramento County project with  
2 CALeVIP. And we offer -- we're -- they're offering up to  
3 \$6500 per port for qualified low-income multifamily projects.  
4 Or we do also offer an alternative. If they choose not to  
5 participate in the CALeVIP program, they can participate in  
6 SMUD's program at \$1500 per port. And so we're very  
7 interested in working with multifamily, we just know that  
8 there are significant, you know, this is a policy, right?  
9 How do they want them to provide that to their tenant? How  
10 are they going to define who gets it and who has access to  
11 it? So some of it is about how we deliver it and manage it  
12 with their tenants on an ongoing basis.

13           Once the property management has defined how they're  
14 going to do it, then we kind of see which program makes the  
15 most sense for them. So we're excited about being able to  
16 continue the leverage of other resources for them using this  
17 program.

18           Next slide.

19           Now as far as our low-income incentives. We have a  
20 very robust low-income program. Now this is based off of our  
21 energy assistance program rate. And we determine  
22 participation within our program based on the participation  
23 at the site. So rather than say globally that a site  
24 qualified based off of -- and there are a number of different  
25 programs both with the state and the region that would

1 qualify a property for a discount, all was based on the  
2 tenant's participation. So with 50 percent or more of the  
3 tenant's qualifying or actively participating, then that  
4 qualifies the site.

5           Now that might be that we found out up front property  
6 managers hand this information on the retro, you know, the  
7 tenants, the location, we can do more research upfront. And  
8 say, okay, you know what? You're over 20 percent, why don't  
9 we send out some information and see if we can encourage  
10 participation. If you believe that you have the -- tenants  
11 that qualify based on information that you've been given from  
12 them and most likely you would if they were a loan from  
13 property, then we would like to help you increase that  
14 participation.

15           Because at the end of the project which these project  
16 cycles can be, you know, several months, sometimes up to 18  
17 months. At the end of the project, we do a requalification.  
18 And at that time, if funding's available, then we would be  
19 able to go ahead and offer that to them.

20           And so it's not a one and done at the beginning when  
21 they submit their application. We go back and revisit it for  
22 those that didn't qualify at that very beginning. We give  
23 every opportunity for them. So I'm always excited to be able  
24 to go back and do that and offer them those resources.

25           And go on to the next slide.

1           Now as you can see for both our Smart Homes and our  
2 Multifamily programs, we have a lot of resources and  
3 investments in the -- the program website and in our  
4 collateral that educates our customers and our -- and some of  
5 our contractors. We leverage all of the work that's  
6 happening not just on the commercial side of the house but  
7 our residential side as well.

8           We had our programs team and then we (indiscernible)  
9 a dedicated group of strategic account advisors that work  
10 directly with our builders and our developers and our  
11 multifamily property managers and customers. We utilize a  
12 third-party program support team that supports both programs  
13 independently to provide a technical review and analysis of  
14 the project to make sure that not only does the application  
15 submittal meet our (indiscernible) requirements for equipment  
16 specification but also that there's ongoing support  
17 throughout the program cycle, especially since it is, you  
18 know, these do take quite some time to complete.

19           I mean, I've got a project that will complete this  
20 year, and given COVID. I had others that are probably going  
21 to get pushed out six months. I mean, it just is what it is,  
22 right? And so we need that third-party support to supply  
23 that -- that additional support that we need.

24           And then we have our builder supporting engagement  
25 and our tenant engagement plan to help really educate the

1 builder and the new property owners for a single-family.

2 (Indiscernible) they are probably management team from the  
3 back end from multifamily.

4 And then finally it's just the industry. How do you  
5 support contractors? How do we work with distributors? And  
6 how do we work with the manufacturers to help them understand  
7 what our needs are and how we want to deliver our product  
8 which is the program to the community at large?

9 And so granted this program is really on the  
10 implementation side but we couldn't do this without all of  
11 the support from, you know, other -- other areas like our  
12 partnerships with the state's fuel income weatherization  
13 program. We partner with other agencies as well to make sure  
14 that customers can take advantage of multiple program  
15 incentives. We allow the opportunity for them to layer the  
16 programs, making the project more cost effective. It's  
17 really important for us to ensure that our customers can take  
18 advantage of those opportunities while still addressing, you  
19 know, contractor and customer education and providing them  
20 with additional resources.

21 One of the things that we've done most recently is  
22 we've added in a new electrification handbook that we are  
23 putting together. And that electrification handbook will be  
24 for all of our commercial customers and talking not just  
25 about building electrification but it will build in things

1 like transformer capacities, how do you determine where your  
2 head space is? What should you be looking for as a customer?  
3 Whether, you know, you're a building or you're a commercial  
4 entity or multifamily property owner and you want to find out  
5 what the profits would be to identify those measures that  
6 will best fit your facility.

7 And so we are really trying to work very much within  
8 the hour vertically integrated space as a utility to identify  
9 areas that we can leverage support our customers' needs and  
10 we really support this market transformation and to lead the  
11 effort in our area.

12 And I think that's it for me. Thank you very much.  
13 I appreciate the opportunity to be here today.

14 MS. MATEO: Thank you, Leah and Srinidhi for sharing  
15 that.

16 Yeah, those three presentations were a good overview  
17 of the multifamily building sector just from the context of  
18 building decarbonization.

19 We'll move on to the Q&A portion. And if -- I'm not  
20 sure if the -- any of the commissioners are present for  
21 questions. I can kick us off with one question.

22 So for -- question for our (indiscernible) panelists.  
23 How do decarbonization plans or choices differ from existing  
24 multifamily income-restricted projects?

25 Go ahead and let (indiscernible) kick that off.

1 MS. KUMAR: Sorry, could you repeat the question?

2 MS. MATEO: Sure. How do decarbonization plans or  
3 choices differ from existing multifamily income-restricted  
4 projects?

5 MS. KUMAR: Yeah, I think there's a lot of  
6 opportunity because they're already derestricted so many of  
7 the programs that do require that low-income programs that  
8 specify income qualifications, it's easier to qualify these  
9 properties and easier to provide funding that goes into them.  
10 Even providing -- even going above and beyond in talking  
11 about rent restrictions and not really passing on the cost,  
12 it's easier to monitor regulate these properties than  
13 regular, like, derestricted affordable housing, which I'm not  
14 sure you're including affordable housing.

15 So there's just a lot of opportunity to implement  
16 many of these programs and this sector first and see how it  
17 plays out before it's offered up to the natural occurring  
18 affordable housing.

19 And I think in terms of cost and barriers, I think  
20 both Katie and Leah highlighted a lot of them one from  
21 program implementation perspective itself. And I think  
22 definitely cost barriers exist and most of these projects can  
23 and do electrification largely as part of a (indiscernible)  
24 have projects so when they get refinancing, that's when  
25 they're capable of doing (indiscernible) large investment

1 into their property.

2           Having said that, that needs to be considerations  
3 made for standalone retrofits and how that can be made  
4 possible as well. And I highlighted the (indiscernible)  
5 upfront financing is something important for these -- for  
6 this community. And I think because of COVID-19, a lot of  
7 programs are definitely looking into it. So I think  
8 that's -- that'll be a good learning lesson for all program  
9 implementers to see what comes up through that. And  
10 definitely there are opportunities that could proceed beyond  
11 COVID-19.

12           MS. MATEO: Thank you.

13           Katie or Leah, if you have anything to add? If not,  
14 we can move on to public comments.

15           I'll pass it Dorothy and Brian.

16           MR. SAMUELSON: Okay. This is Brian. I'm going to  
17 go up to questions we had for this panelist.

18           The first one was John Norwood, specifically for  
19 Katie Wu.

20           He says: Many multifamily buildings include swimming  
21 pools and hot tubs or spas.

22           For a heating stand -- from a heating standpoint, we  
23 know of no practical alternatives to heating this water. As  
24 we understand it, the space alternatives to heating -- or the  
25 space required for the number of heat pumps is impractical

1 and solar is only a partial solution. How do you handle  
2 about maintaining natural gas or going to biogas?

3 MS. WU: That's a great question. I don't know that  
4 I have a great answer, though. I think that this comes with  
5 sort of the nascent of the marketplace in offering solutions  
6 for these high-capacity, high-demand end uses. You know,  
7 potentially maybe there's an opportunity to combine solar  
8 water heating with some form of electric water heating or in  
9 terms of panel capacity, it sounds like you would need at  
10 least a 400 amp panel or perhaps have a panel that serves  
11 only those end uses.

12 I think that this an area where the industry needs to  
13 provide some input where -- where commercial property  
14 managers or where hot tub and swimming pool manufacturers may  
15 be able to provide some insight into alternate -- alternate  
16 approaches to heat that water.

17 MR. SAMUELSON: Okay. Cool. This is Brian, again.

18 I will go on to the next question from Diane Moss.  
19 First off, information like it says: Are you aware that  
20 Germany -- excuse me, this is for the whole panel, they want  
21 from the panel.

22 Are you aware that Germany is planning to convert  
23 thousands of kilometers of existing gas infrastructure to 100  
24 percent green hydrogen and that European gas grid operators  
25 are planning to make their pipelines net carbon neutral by

1 2050?

2           And are the panelists open to expanding the concept  
3 of building electrification to include electric gas to help  
4 decarbonize top building application?

5           Are the existing buildings or buildings in wildfire  
6 areas that are particularly prone to long power shutdowns  
7 that batteries are not economical or technically optimal for?

8           MS. WU: This is Katie. I can maybe offer a little  
9 bit of information but admittedly this is also another area  
10 that I think is new in California. And I know that there are  
11 many people who are interested in this potential to repurpose  
12 the existing gas infrastructure and to lower the carbon  
13 content of fuel within that infrastructure. I think that  
14 there's a lot of opportunity and as I understand for green  
15 hydrogen, there is a lot of potential as well for leveraging  
16 that fuel.

17           I believe in L.A., the LADWP is repurposing one of  
18 their gas fired plants to leverage hydrogen. But as I  
19 understand, there are some pipeline engineering standards  
20 that may need to be revisited if the fuel within the pipeline  
21 changes. And so those are just some considerations to work  
22 through. I think that California may be able to take that on  
23 but it will, you know, like -- like many solutions, it will  
24 require partnerships, it will require collaborative thinking  
25 through what -- what safety standards need to be in place,

1 what engineering standards need to be better understood, and  
2 how -- how we can repurpose existing infrastructure.

3 MR. SAMUELSON: Okay.

4 MS. KUMAR: I can just answer. This is not something  
5 we've done as part of our work but right now our priority as  
6 an organization is just to make sure that fuel switching is  
7 possible. And we are very much in favor of battery storage  
8 and the (indiscernible) and we'd really like those  
9 investments going into it and seeing what those impacts are.

10 And from what we've read, we've just seen that  
11 battery storage actually having electrical equipment and  
12 giving (indiscernible) actually turn on a lot faster than gas  
13 equipment, but I've not work on the hydrogen side of things.  
14 But we are really excited about the battery storage.

15 MR. SAMUELSON: All right. This is Brian again.  
16 We've got one more -- got another question and it looks like  
17 there will be some more from others.

18 This is for -- for Leah from John Norwood. Is SMUD  
19 open to biogas or other gas (indiscernible) for multifamily  
20 building like apartments, dorms, condo that has swimming  
21 pools, and spas? Heat pumps are not practical alternatives  
22 for these facilities.

23 MS. PERTL: So what I would say is that we do look at  
24 a mixed fuel solution. And with mixed fuels, we - -are  
25 looking as kind of a gas for solutions plus obviously the

1 heat pump solution. So you -- we would have a mixed. We  
2 haven't found that -- that's not a practical opportunity for  
3 customers to participate in.

4 So I would have to say that we do -- we would take a  
5 custom solution for customers within the multifamily market  
6 as well as we would for any other commercial segment.  
7 Because we know that there are some technologies that are  
8 better suited to that environment. But more specifically to  
9 the central plant design so I would say that we would  
10 definitely look at it. We wouldn't, you know, cross -- say a  
11 flat out no to that opportunity, but we would want to make  
12 sure that it was cost effective and could be sustainable from  
13 an operation standpoint for the customer as well.

14 So at the end of the day, we want to make sure that  
15 they're implementing something that they could manage for the  
16 long term.

17 MS. MATEO: Thanks for that.

18 I'm going to start wrapping up unless our panel has  
19 any last thoughts.

20 I'll pass it to Jen to see if she has a few words to  
21 say before we head -- head for our break.

22 MR. ROSALES: Jennifer, I think you're on mute. This  
23 is Eddie.

24 MS. NELSON: Great. Sorry about that.

25 Thank you, panelists. Thank you, Tiffany.

1           Commissioner, do you have any questions or comments  
2 for this panel before we head to our lunch break?

3           COMMISSIONER MCALLISTER: No, I just wanted to say  
4 thanks to the panelists and to everybody for hanging in  
5 there.

6           It looks like a very little atrophy in terms of our  
7 participant group, so I'd like to see that through the  
8 afternoon, really a lot of substance there and tons of stuff  
9 to follow up on. That way -- we can never do an issue as  
10 rich as this, or a set of issues for a position as rich as  
11 this. Full justice in the day webinar really does depend on  
12 the comments and interactions subsequent.

13           So we're really breaking the ice here and laying a  
14 platform for building something substantive going forward.  
15 So appreciate that.

16           So looks like with that, we will reconvene at 1:15  
17 and I'll see you there, and pass it back to Jen.

18           Thanks, everybody for their attention.

19           MS. NELSON: Great. Thank you, Commissioner.

20           Thank you everyone. We will now take a 30-minute  
21 break and we will return at 1:15.

22           I do expect that we will expand the public comment  
23 period this afternoon by 15 or 20 minutes. We are lucky that  
24 we have a lot of people who want to ask questions, and has  
25 questions they'd like to comment. We want to make sure we

1 get as many as possible on the record.

2 So thank you for your attention and I will see you  
3 again at 1:15.

4 Thanks.

5 [Off the record at 12:46 p.m.]

6 [On the record at 1:18 p.m.]

7 MS. NELSON: Great. Welcome back, everyone. I'm  
8 going to go ahead and pass the virtual microphone over to  
9 Gabriel Taylor who will be the moderator for our third and  
10 final panel on Commercial Buildings Sector.

11 Gabe.

12 MR. TAYLOR: Thank you, Jennifer.

13 Good afternoon, thank you for joining the Energy  
14 Commission's Building Decarbonization Workshop.

15 We now pivot to the Commercial Buildings Sector with  
16 three panelists followed by questions and discussion.

17 Share my screen real quick here.

18 Would the host please switch the presenter over to  
19 Cathy.

20 Our first panelist is Cathy Higgins. Cathy is the  
21 research director at the New Buildings Institute and has over  
22 25 years in the energy efficiency strategic planning,  
23 research, policy, and largescale project management.

24 At NBI, she manages evolving work on zero net energy  
25 and zero carbon buildings, building electrification,

1 performance measurement, market and policy trends, and  
2 emerging technologies. Cathy is currently leading a field  
3 demonstration in Los Angeles on office retrofit potential,  
4 the building technology electrification roadmap. She also --  
5 she's also supporting the advance water heating initiative  
6 and the New York carbon neutral roadmap.

7 Cathy, I believe you have -- there you go. I can see  
8 your screen, Cathy.

9 MR. ROSALES: Cathy's on mute.

10 MS. HIGGINS: I have to find the mute.

11 Am I unmuted?

12 MR. TAYLOR: You are unmuted.

13 MS. HIGGINS: There we go. Thank you. Thank you,  
14 all. Let me get back to the PowerPoint, vision slideshow and  
15 get going to keep you all on schedule in this important  
16 workshop.

17 So thank you for having me. I see Alberto's -- see  
18 him up there, let me see if I can get him to disappear.  
19 There we go.

20 Thank you. As Gabriel said, I'm the research  
21 director at New Buildings Institute. I'm here to speak on  
22 commercial sector trends in relation to the building  
23 decarbonization workshop.

24 Get it so it advances. New Buildings institute. We  
25 were founded in California in the late 1990s. We're located

1 in the northwest now, but we have offices a few other places.  
2 We're national, work primarily in commercial and multifamily.  
3 And we really are focused entirely on the built environment,  
4 its relationship with the grid and with the occupants and how  
5 to reduce emissions through energy efficiency improvements  
6 and other strategies in three primary program areas.

7 Building program innovation, which is what I lead  
8 which has the research and the carbon -- decarbonization  
9 section. Our zero energy and carbon leadership which is more  
10 of a market change mechanism. And then what we're really  
11 quite well known for advancing codes at both the national,  
12 state, and city level.

13 So two of the topic that you're interested in today  
14 and that we'd love to contribute to which is how to make all  
15 of California's commercial sector decarbonized and beautiful  
16 too.

17 One of the first messages I have for you is to build  
18 on energy efficiency and zero net energy. Don't forget that  
19 the buildings you're trying to decarbonize have come a long  
20 ways with this vocabulary. There's many great examples,  
21 we're the largest -- we keep the largest database on zero  
22 energy buildings and now we're tracking zero carbon  
23 buildings. But half of those buildings are in your state or  
24 in California as we well know from running the California  
25 watch list for five or six years on behalf of CPUC. So

1 there's certainly good foundation to build on and  
2 decarbonization encompasses a lot of factors that energy  
3 efficiency's very critical to.

4           So when I think about change, when I think about  
5 strategy, the thinkers in the commercial section are going to  
6 be on programmatic and finance. So I'm going to be a little  
7 more upstream on strategy and always approach problems with  
8 this diagram I've used for a while which is getting the four  
9 Ps in place. And I know that very well that California has  
10 these. But this is your policies, your price, signals,  
11 products technologies, and the people, the marketing, the  
12 workforce.

13           So if you can keep your communications very clear and  
14 concise like this and say what you're doing in your areas and  
15 make sure that there aren't gaps, that will help the market  
16 and both private and public sector understand what you're  
17 doing and follow the path that you're laying out. So I'm  
18 going to speak to most of these items right now and my  
19 recommendations and responses.

20           And one thing that came out last week in the policy  
21 area that I'm sure any of you that are longer term like I am  
22 would not have five years ago thought that we would have as  
23 much momentum as we do nationally, particularly. Sure  
24 California, New York, Massachusetts, even the northwest a  
25 little ahead of curve. But you see here in ACEEE's May

1 publication of rules and policies to enable beneficial  
2 electrification in buildings. Through the words very forward  
3 facing fuel switching. That was not a word that was forward  
4 facing in policies previously. And now you see momentum  
5 towards it.

6           So although you are, you know, ahead of the curve,  
7 you can certainly continue to model and learn from colleagues  
8 and see what other areas of support your agenda because if  
9 it's more national, it advances you more quickly. You heard  
10 from the residential sector, we know very well that the  
11 cities are leading in what was previously known as reach  
12 codes that you like to prefer to call. Codes that have  
13 advanced beyond your Title 24 code.

14           And I tracked these a little different than this  
15 diagram that's kept at BDC, but I track actual adopted dates  
16 and I keep an eye out for things outside of California. You  
17 certainly have the most, over 30 buildings, but there's a few  
18 other states that also have adopted either mandated  
19 electrification or electric preferred which may be an  
20 incentive to the -- to adopting electric technologies  
21 universally or maybe a penalty if you're dual fuel, an  
22 increased fee.

23           So there's a lot of paths people are taking, it's not  
24 one size fit all when you look at policies. And these  
25 policies and the priority that they play in moving the market

1 forward towards your decarbonization goals are really founded  
2 in the fact that if a city or a jurisdictional area has a  
3 climate action plan, that's a forward looking document, but  
4 they don't have the activities to get there and reach codes  
5 and policies are certainly foundational. And you see on the  
6 right is that enhance what you put into regulatory statute  
7 and standards that they want to build on.

8           And we shouldn't forget that there's a critical piece  
9 that is nonregulated, becoming larger and larger proportion  
10 of buildings. As we do better and better with codes, the  
11 unrelated loads consume a larger proportion. And we need to  
12 look at policies that are pretty nascent, there's some  
13 bolder, Seattle tried out, building performance codes that  
14 are requirements for submitting and hitting targets on a  
15 post-occupancy basis. And I know you're familiar with that,  
16 but that is something that is further down the curve and  
17 probably needs to be our future in order to comprehensively  
18 address all the energy and carbon issues.

19           News Buildings Institute has done a number of tool  
20 kits. There's others in place too. Really got to support  
21 cities and local governments with easy to understand and  
22 comprehensive sets of resources and tools that can help them  
23 be your -- be your pathway to the people they represent in  
24 their community. Then you cross through the Chamber of  
25 Commerce, you cross through schools, you cross through

1 residential and commercial both so that they are such  
2 critical gateway to decarbonizing.

3           Again, to really communicating succinctly, we formed  
4 an item because we work so much in policies that we call our  
5 five foundations to zero carbon buildings. You can see that  
6 it builds historically on something that we've already had  
7 for 30 to 40 decades here energy sufficiency and now  
8 renewable energy. So it moves from the known to the new, as  
9 you move to the right. And so it's important to be  
10 comprehensive. And I know you're -- be getting into kind of  
11 the new area of embodied carbon if you're going to look at a  
12 complete carbon neutral building.

13           But if you were talking differently to the -- to the  
14 parties that are designing buildings or owners that are  
15 considering new buildings, these would be flipped in a bit  
16 different order. If you had new building, you'd want to  
17 start with your material selection and your energy  
18 efficiency. So the difference in who your audience is and  
19 what your messaging is. But keep it clear and simple and  
20 easily understood.

21           Now to the products part of that quadrant. We have  
22 tons of technologies that can electrify buildings. There  
23 are -- we just saw from the morning's presentation, thousands  
24 and thousands of homes already that have gone all-electric.  
25 Certainly can show you hundreds of buildings through some

1 leading firms in California, EHDDE and Integral and others  
2 that have built all-electric buildings. So we know how to  
3 electrify and we have technologies, but we're also needing to  
4 make sure the pipeline is full and the supplier chain can  
5 deliver those buildings.

6 And through some work with building decarbonization  
7 coalition, Panama you hearing this morning. But building  
8 electrification technology roadmap, we're calling it a better  
9 roadmap. Great name in Defense Water Heating Initiative.  
10 We're working collaboratively in California to bring forward  
11 the list of technologies and the barriers and their readiness  
12 and get the pipeline identified for what's ready and what  
13 scabs for program administrators.

14 So product and readiness are some available, some  
15 coming. And kudos to the (indiscernible) project that just  
16 announced its successful applicants for low GWP. Because if  
17 you look at a roadmap, you're going to see the conventional  
18 refrigerant technologies and we push all to heat pumps,  
19 there's a little bit of alteration in the greenhouse gases  
20 associated with refrigerants so we're going to have some  
21 great research and market pull on low greenhouse warming  
22 potential heat pumps thanks to Epic.

23 So what are these challenges? That was one of the  
24 things Gabriel asked us to speak to and so as succinctly as I  
25 can I stated them here that first and foremost, the utility

1 savings don't cover costs.

2 I'm going to pause on this one because money -- I  
3 mean, I've been in this field a very long time. Every survey  
4 you do and every guidebook I've ever done, you have to  
5 address cause. I'm not saying you don't but it is our  
6 Achilles heel, we have got to get off the band wagon of  
7 feeling like we have to be accountable to pay back and no  
8 other product does. You can't tell me probably three  
9 products easily in a home or a building that is accountable  
10 to payback.

11 We've got to change the dialog, you've heard it  
12 before, but it isn't -- it isn't our nature. Our programs  
13 savings by design. We've got to get into the other metrics  
14 that are important to owners just like any other technology  
15 and stop feeling that we have to have the unique metric that  
16 other products don't. There's benefits and interests that we  
17 can speak to that don't have to go to the payback. And if we  
18 don't put payback to rest in commercial and only deal with  
19 return around investment, I'm not going to have done my  
20 career's agenda either.

21 We know that workforce training's needed, both in  
22 terms of product awareness and in familiarity. We talked  
23 to -- about the building owners, they don't really know about  
24 some of these products, that's got to be raised up.

25 We have site constraints in commercial as well with

1 panel sizes, physical barriers. Retrofit is the name of the  
2 game and we've got to figure how to scale commercial  
3 retrofits.

4 We don't have a fully funded statewide effort but two  
5 programs I just mentioned that we're working with BDC on just  
6 a really having to patch together pieces of funding to do  
7 electrification roadmaps. How can we get more universal  
8 funding source? And again, kudos to the new SGIP and Tack  
9 and Built, you're on those paths. But they're absent now and  
10 will they be sufficient?

11 The adoption rates that are going to be necessary to  
12 meet these targets for the water heater example here. I  
13 think there's 12 -- 12 million water heaters residentially in  
14 California and 90 percent are gas, we're going to decarbonize  
15 those. We can't do 100 today as Peter Trimble says, we have  
16 to do more than 1,000 a day. 1,000 a day is still a 30-year  
17 accomplished target to do 90 percent or 12 million water  
18 heaters.

19 How can we push the acceleration quicker? And lastly  
20 clearly time of use. As we electrify and decarbonize and  
21 increase the electric load, huge time of use impacts. One of  
22 the biggest barriers that we encounter, of course, in talking  
23 about technologies, it's not water heating, space heating,  
24 it's emotional response to cooking, fireplaces, barbecues,  
25 behavioral changes. Our industry needs to continue to

1 embrace behavioral sciences and how to shift attitudes and  
2 perceptions about items.

3           So to that solution side, here's a -- here's a graph  
4 on a whole lot of other technologies. Our industry needs to  
5 look at things that were popularized, their penetration rates  
6 and curves. There aren't very many efficiency products that  
7 have had the type of curves that the electronic industry has.  
8 How do we make these attractive? How do we popularize them?  
9 Let's have somebody dedicated to looking at models and trying  
10 to get our technologies and our strategies and market  
11 messaging to mirror where there's been other success  
12 examples.

13           So when we talk about products, they better be  
14 integrated and they better have smart controls. A lot of you  
15 know that New Buildings Institute and USGBC are working with  
16 utilities around the country a handful including Southern  
17 California on describing metrics that identify a grid's  
18 friendliness and be able to label that building in terms of  
19 its operational and physical attributes that interact with  
20 the bilateral nature of the grid that we have today.

21           So again in communications and to decarbonize,  
22 getting the message out, this is from you guys's CEC, from  
23 Martha Brooks, we do use these heat maps a lot, we want  
24 transparency of carbon emissions so that somebody who might  
25 have gone into a fully PB net zero assumed building, then say

1 what do you mean I don't have a green carbon footprint in  
2 24/7? That understanding, that transparency, and that  
3 ability to alter loads so that they contribute well to green  
4 is highly critical and needs to be one of the forefront items  
5 to changing the commercial sector.

6           Here's an example of what we did with Sonoma Clean  
7 Power on that topic. You can see here that we have a  
8 December baseline building. This was their headquarters as  
9 designed. Their proposed typical baseline building in Sonoma  
10 would have been a gas hybrid building. The -- a construction  
11 document proposed was lower than that but then when they made  
12 it net zero to solar, you see a pulse of peak down by more  
13 than 50 percent and it shifts to peak in summer to a later  
14 lag which is beneficial.

15           And down here on the bottom graph what you're seeing  
16 is a carbon and energy being now twin and complementary to  
17 goals and metrics. Carbon actually exceeds slightly the  
18 energy savings in terms of its benefit to the building and  
19 its timing. And these -- what I want to emphasize here is  
20 these ECMs, energy conservation measures, were series of  
21 things that improved the building envelope. So we tend to  
22 get very focused on that heat pump technologies as we should  
23 as displacement to incumbent gas technologies. But the shell  
24 and the envelope, getting it reduced is where your biggest  
25 savings can be in terms of normalizing the carbon.

1           And here's a few comments over here on the left about  
2 the game changers of outing the electricity that's going to  
3 come and that we start with low envelopes and ramping  
4 strategies so that not only the heat pump water heater is  
5 known as a storage battery because you can load it in the  
6 peak day and then cruise on it in the evening, so is the  
7 envelope. Think of the building as a battery in the same way  
8 that you're talking about the -- the hot water heating as a  
9 battery.

10           As I'm getting toward the end of these slides, I  
11 always just really am pleased with the work done by Johnson  
12 Controls on their energy efficiency survey globally. And I  
13 just have one snippet here because knowing our audience,  
14 knowing how we're going to change the market, this survey  
15 represents thousands of business owners.

16           And last year -- this is kind of a two-year study --  
17 energy cost savings in the U.S. was one of the largest  
18 important reasons for -- for investing in energy efficiency.  
19 82 percent said that's their number one reason, 71 percent  
20 said greenhouse gas reduction, that's the last survey. You  
21 can see the new survey, the shift in mentality in the private  
22 sector of the importance of gas whether it's because of risk  
23 management with their corporate sustainability reporting or  
24 because of forward facing to their -- to their clients or  
25 regulatory anticipation, it is the forefront according to

1 their own response to this survey.

2           So we can leverage that, we're going to keep that  
3 message front and center, and we're going to give them  
4 business reasons why it's in their interest. I was up in  
5 BC -- BC Hydro before the no travel, just literally before,  
6 working on a -- on a heat pump for roadmap. And I have a  
7 beautiful case examples for the business sector of how -- why  
8 zero carbons in their interest.

9           And now as I come to the end here, I just for your  
10 workshop, I was thinking in this last couple of months, of  
11 course, about the COVID implications, Gabriel mentioned I  
12 should speak to that. And I made this diagram on the right.  
13 And as I thought about the things that have been so prominent  
14 in our conversation the last two months, the occupancy  
15 variables incredibly different changes in terms of returning  
16 the buildings at half occupancy prolonged periods where two  
17 shifts change. Ventilation strategy certainly are going to  
18 be a big help.

19           I just wanted to spotlight that ventilation  
20 strategies, although some of us kind of cringe that, you  
21 know, moving to increase outside air which is a health,  
22 potential health and likely health benefit, doesn't have to  
23 be an energy penalty that's combined at the same time with  
24 both retro commissioning and HRV energy recovery ventilation  
25 or heat recovery. It can be strategy that the energy doesn't

1 go up if it's done integrated.

2           And the other item that was -- Commissioner  
3 McAllister mentioned at the beginning is that equity, down  
4 here at the bottom of my diagram. When you look at who's  
5 returning to buildings first and who's likely to have to  
6 continue to be in buildings that may not have upgraded for  
7 health and well-being, that's probably going to be a dis --  
8 the wagering level of those people and the equitable equity  
9 in terms of who was able to work at home and who is not.

10           So we need to do a good job on those ventilation  
11 guidance, make sure they're coupled with strategies that  
12 don't peak energy, get these new utilization patterns in  
13 place where I'm working with my project in L.A. right now to  
14 figure out how to -- how to analyze a building that's not  
15 occupied and provide the owner variable ranges of occupancy  
16 and their energy implication.

17           And what does off look like? During this last period,  
18 I'll bet that there's a lot of wasted energy in what people  
19 think is an off building. That's a new area that we could be  
20 going to in terms of helping the commercial sector.

21           So I've covered these things. I just put them in for  
22 the record for the workshop and I added a bonus slide of  
23 drivers. So these two last slides are just for the record of  
24 reference in the future. And I've completed my presentation.

25           Thank you.

1 MR. TAYLOR: Thank you very much, Cathy, that was a  
2 very data heavy presentation and we really appreciate  
3 building our record for this proceeding.

4 So our next presenter is Chris Malotte. Chris  
5 manages the regulatory policy and strategy aspects of  
6 Southern California Edison's demand site management programs.  
7 Chris helps develop new programs, manages the current clean  
8 energy optimization pilot, and leads SCE's coordination with  
9 SoCal and tri-county regional area networks.

10 Prior to SCE, Chris managed electrical vehicle,  
11 renewable energy, and new technology assessment programs at  
12 Arizona Public Service Electric Company.

13 Chris, are you ready? I'll be controlling your  
14 slides.

15 MR. MALOTTE: Great. Thanks, Gabe.

16 Would you mind advancing to the next slide?

17 So there's a lot of good activity that's going on at  
18 Edison right now. I'm going to highlight one particular  
19 pilot that focuses on incentivizing carbon reductions for a  
20 large commercial customer.

21 So SCE has laid out a couple of white papers, one's  
22 called Clean Power and Electrification Pathway, the other  
23 one's called Pathway 2045. Both of those lay out our vision  
24 for where the grid is going and more broadly where carbon  
25 reductions can happen.

1           As part of that, one of the key things that we wanted  
2 to do was highlight that it's -- we want to drive it to the  
3 customer to make clean energy choices. So as part of that,  
4 we developed this pilot program that seeks to incentivize and  
5 accelerate customers to make decisions to do onsite behind-  
6 the-meter carbon reduction activities.

7           So the goals of this pilot are to pilot the  
8 incentive, encourage customers -- pilot the incentive, see  
9 how it does, determine the effectiveness and the impacts of  
10 this particular performance-based incentive, and then  
11 determine the customer-solution preferences based on their --  
12 this particular model.

13           In terms of the benefits of this particular pilot,  
14 it's more -- the primary one is the alignment of everyone's  
15 goals in the same direction. So this particular model aligns  
16 the incentive with the state's goals and increasing our  
17 customer's goals of carbon reduction. It also allows  
18 flexibility for the customer to choose the technology that  
19 they wish to pursue.

20           The incentives are performance based so the risk goes  
21 to the customer but as long as they perform, they will get  
22 those incentives. And then we also think that this is a  
23 model that can be scaled across different commercial sector  
24 customers, particularly for large customers that are master  
25 metered and have a focus on carbon reduction.

1           So in terms of the pilot customers, we have two pilot  
2 customers, one is the UC system and the other one is the  
3 California State University system. The pilot is a four-year  
4 pilot and part of the reason that we're able to have this  
5 flexibility and how we incentivize things is the funding  
6 source for this program which uses our cap and trade auction  
7 revenues. So it's a little portion of the climate credit  
8 that's normally to customer's bills. A small portion of that  
9 goes towards this program.

10           So the way that the pilot works. If you look at the  
11 bottom left-hand side of this particular slide, it looks at  
12 both the electric and the gas meters and comprehensively as a  
13 master meter across the entire campus which allows customers  
14 to do things like energy efficiency or cogeneration natural  
15 gas-type efficiencies. But also to do things like onsite  
16 renewables or smart load growth, fuel switching, and also  
17 clean transportation. So we've -- we've incorporated the  
18 ability for them to electrify their fleets and also  
19 student -- and installed chargers for students and faculty.

20           So go to the next slide.

21           This lays out the campuses that are in the particular  
22 pilot. As I've said it's SCU and UC. So we have a variety  
23 of different campuses. So we've got large, essentially many  
24 cities from UC Santa Barbara and UC Irvine, Cal Poly Pomona  
25 and Cal State Dominguez Hills. You also have two medical

1 centers in UCLA and UC Irvine Medical Center. And then we  
2 have a veterinarian school in UC Davis. So there's -- part  
3 of the reason that this really made a lot of sense with UC  
4 and CSU is both of them have a really strong focus on carbon.  
5 UC's goal is to be carbon neutral by 2025 and CSU is not far  
6 behind that.

7           They also have a wide variety of different building  
8 types. So the campuses as I said are mini cities but what we  
9 can do is extrapolate from that. If this particular model  
10 works really well in dormitories, that might be something  
11 that we can apply to multiunit dwellings. Or if this were to  
12 work really well in lab spaces, it might be something that's  
13 more comparable to an industrial, that sort of thing. So  
14 these two campuses are a particularly good fit for testing  
15 out a pilot like this.

16           You can go to the next slide.

17           This is how the incentive works. Basically for the  
18 pilot, we set a baseline and then each year, we measure  
19 against that baseline. So it's kind of -- I broke it down  
20 into three easy steps. So the first step is you gather all  
21 the meter data. And that's all of the electric and the gas  
22 meters that we're considering within the fence line. So for  
23 this particular thing, it's within five miles of the campus,  
24 all of the meters within five miles of the campus. That  
25 includes both the cogeneration and the heating natural gas

1 meters.

2           The second step is to do adjustments to the  
3 calculations. So there are two ways that we do adjustments.  
4 One is for electricity use for transportation. And the  
5 reason for that is because it shows an increase in  
6 electricity usage but there's not a decrease elsewhere so we  
7 have to offset using the low carbon fuel standard method to  
8 say that this is the gas that's being displaced -- gasoline  
9 that's being displaced.

10           And then we control for two things. These are two  
11 things that weather and square footage. Weather because it's  
12 highly dependent on -- electricity and gas usage is highly  
13 dependent on weather. Square footage because we didn't want  
14 to prohibit the campuses from getting to grow. But we wanted  
15 them to do it in such a way that it was the most carbon  
16 reducing or carbon neutral possible.

17           The third step is taking all these inputs and  
18 converting them to greenhouse gas emissions. Eye level we  
19 take the electricity, we multiply it by an electricity  
20 emissions intensity factor, we take the natural gas and  
21 multiply that by a natural gas emissions intensity factor.

22           The electricity one's a little bit more complicated  
23 than that because we factor in time of day. So we factor in  
24 by TOU periods what the greenhouse gas emissions are for that  
25 given TOU period by month. And then what you get is an

1 output and the output is two things. One is the baseline and  
2 you'll see that the baseline's going down over time. And  
3 then the second is the performance. So each year we'll be  
4 measuring that performance. And the baseline will continue  
5 to reduce and get lower and lower as the campuses are  
6 continuing to get greener.

7           You can go to the next slide for me.

8           So these are some of the activities that the campuses  
9 are currently pursuing. As I said, the pilot incentivizes  
10 only behind-the-meter opportunities and we were really  
11 focused on that for several reasons. But for UC's carbon  
12 neutrality goal, they were originally -- you know, the goal  
13 is be carbon neutral by 2025. And they're going as  
14 gangbusters as they possibly can to get to that but they  
15 realize that there's a large gap between where their  
16 trajectory is and where they are meaning to be. And so a  
17 large way of them being able to meet that is through carbon  
18 offsets and biogas contracts.

19           The problem with both of those is scalability and  
20 applicability to other customers. And part of the reason  
21 that UC wanted to do their carbon neutrality by 2025 was  
22 because they wanted to be an example to the rest of the state  
23 on how to do it effectively. And so they really want to  
24 focus on behind-the-meter activities and we do, too, because  
25 we think that's something that could be scaled across the

1 board.

2           So the campuses are able to explore different  
3 opportunities including energy efficiency, operational  
4 efficiency so that includes things like with their  
5 cogeneration units, making them more efficient. Converting  
6 to all-electric centralized systems, doing supply site air  
7 handlers, controls, focusing on solar and batteries. And in  
8 this case, using the batteries for carbon reduction as  
9 opposed to more bill management. And electrification of gas  
10 boilers and electric vehicle charging.

11           One piece that I think is really cool about this  
12 program is because we're looking at the entire campus in the  
13 master meter, it allows the -- anyone who wants to focus on  
14 doing something on campus, they can do it. So the campuses  
15 are able to leverage their students and their passion to be  
16 able to do behavioral programs within the dormitories. Like  
17 a switch off the lights type of program, that sort of thing.  
18 So it opens it up to anyone within the campus to participate  
19 in this.

20           It also is a good model for kind of how to -- one  
21 question is about how to finance all of this stuff. And it  
22 allows itself pretty well for doing pay for performance  
23 contracting for the UC and CSU. We haven't seen them do that  
24 yet, but this is a model that could be applied where the --  
25 somebody goes and installs a bunch of equipment and says just

1 give us a portion of the incentive you receive. Or just give  
2 us the incentive and you get the bill savings for all of that  
3 stuff. So there's an interesting way of doing the financing  
4 of this side of things.

5 Go to the last slide.

6 I just wanted to highlight some of the other building  
7 decarbonization activities. This particular pilot is only  
8 one of many things that we're doing at Edison. I mentioned  
9 the two white papers, the Clean Power and Electrification  
10 Pathway. But also the Pathway 2045 which was released last  
11 year which looks a little bit further time horizon and how we  
12 plan on decarbonizing both the grid and the state as a whole.

13 There's several programs that we have in flight. So  
14 we have the Clean Energy Optimization Pilot but there's a lot  
15 of other commercial and residential so the emerging  
16 technology is cooking electrification demonstration, is  
17 working with Cal State Dominguez Hills on electrifying their  
18 cooking equipment.

19 We have in our energy efficiency side of things, a  
20 large focus on fuel substitution measures and then in  
21 particular plug loading appliances upstream -- upstream space  
22 and water heating incentives.

23 Focus on reach codes. So Santa Monica's one of the  
24 cities that's been doing that but we're looking at several  
25 municipalities within our service territory, focusing on

1 electric reach codes.

2           And then a couple of other things that were mentioned  
3 earlier today, the Clear Program, the San Joaquin pilot.  
4 Other things that are in development are we have a couple  
5 proceedings in the program design pilots in the income  
6 qualified proceeding that are focused on building  
7 electrification. That's currently being litigated and likely  
8 to come in place something -- sometime in 2021. Both of  
9 those are focused on electrifying both new construction and  
10 low-income households.

11           Also work within the SGIP proceeding and some other  
12 electrification opportunities with incentivizing new home  
13 construction and heat pump water heaters.

14           And I would just like to leave with one example. I  
15 know this seems daunting and the scale of the effort is going  
16 to be large. But it has been done before. We have converted  
17 not us but the UK has converted -- they converted from town  
18 gas to natural gas in ten years. It required them to convert  
19 over 13 million residential units. It required them to  
20 convert over 400,000 commercial units, and something like  
21 60,000 industrial units.

22           So I use that as an example to say if the UK can do  
23 it in ten years to be able to convert from town gas to  
24 natural gas, I think we can be able to do it on the time  
25 scales that we're talking about, we just need to have that

1 focus on actually getting it done.

2 MR. TAYLOR: Thank you very much, Chris. That was  
3 excellent. And clearly, there is an enormous amount of work  
4 that has already gone on in this space and I hope that our  
5 report can capture all of it and do, the work that's already  
6 been done, justice.

7 The next presentation -- or final presenter of today  
8 is Ryan Mazelli. Ryan is the Director of Commercial Programs  
9 for Ygrene Energy Fund. He's been with Ygrene for five years  
10 building a Commercial Property Assessed Clean Energy, or C-  
11 PACE, financing platform for small to medium sized projects.  
12 These projects include energy and water efficiency renewables  
13 and resiliency measures for both new and existing buildings.  
14 To date, the program's financed over \$150 million worth of  
15 projects at more than 1,200 commercial sites, which is over  
16 half of the C-PACE projects funds to date nationwide.

17 Ryan, are you ready?

18 MR. MAZELLI: Yeah, thank you, Gabriel, for the great  
19 introduction and thank you for having me for this workshop.

20 So we can go to the next slide and we'll talk about  
21 the story of PACE and what is it. So PACE stands for  
22 Property Assessed Clean Energy. I want to break down the  
23 acronyms that our government loves to use. So first being  
24 Property Assessed. So this financing is assessed to the  
25 property and is repaid as a tax on the property tax bill.

1 The specific lien position and vehicle that we have to enable  
2 this allows us to streamline the underwriting of the  
3 financing. And so what we're able to look at is essentially  
4 the building as the borrower of the capital rather than the  
5 current property owner. So the financing is primarily based  
6 on the available equity and has been a great alternative to  
7 traditional financing given the fact that all other financing  
8 is really tied to the property owner borrowing the capital.

9 Then the second portion of PACE is Clean Energy. So  
10 we're only financing certain property improvements,  
11 specifically for that individual property for the benefit of  
12 the public and that is at a high-level energy and water  
13 efficiency, energy generation, energy storage, and resiliency  
14 measures like seismic in California.

15 So the story behind PACE really was enabled in  
16 California first back in 2008 through Assembly Bill 811. And  
17 then two years later, a separate bill, Senate Bill 555. So  
18 there's actually two bills in California that enable this.  
19 And so the State passes the legislation and then based on  
20 that legislation, programs are created either at the State or  
21 local jurisdictional level or on a private basis. So you  
22 could consider kind of two models, State-run models, or local  
23 jurisdiction model are then what we call open PACE or open  
24 market platforms.

25 So here in California, we kind of have a hybrid

1 model. And Ygrene is a PACE administrator so we operate our  
2 own program, we're a tip to tail facilitator across the State  
3 and over 300 various jurisdictions in California.

4 Next slide, please.

5 So wanted to give a deeper dive into the specific  
6 improvements. This is even a high-level but broke it down  
7 into four major categories. Cathy brought about the need to  
8 look at the envelope. And that's what I would call cosmetic,  
9 the outside, the shell of the building. And then it could  
10 even be further down to like I have here, some landscaping  
11 and other things. So that's looking at anything, roofing,  
12 doors, windows. And then even now-a-days, we can even go  
13 down to EV charging stations and really a sustainable, from  
14 the outside, looking building.

15 Then you have your comfort and efficiency, all of the  
16 controls, HVAC, mechanical, electrical, and plumbing systems.  
17 And then, so that's all on the efficiency side. Then we have  
18 our renewable energy, mostly buildings are going on the  
19 renewable energy side, mostly solar PV and thermal. But we  
20 can also do Co-Gen, wind, geothermal systems as well.

21 Energy storage is a big thing, that's both on the  
22 generation and resiliency. So here in California, big for  
23 wildfire resiliency. So there was an amendment to the  
24 various bills that enable PACE that brought in wildfire  
25 resiliency. So that includes natural gas, standby

1 generators, and also alternative energy storage as well.

2           And then lastly, seismic retrofits for the various  
3 soft story. There's a big initiative in the city of LA to  
4 retrofit these and this is a great way to finance and  
5 amortize the cost. As well as non-ductile concrete and what  
6 I didn't put in here was hospitals and other key (feedback  
7 noise).

8           Oops. Think we're good now? Okay, next slide,  
9 please.

10           So want to give a high-level comparison of the  
11 available the financing for these capital expenditures, the  
12 building improvements, (indiscernible) either electing to do  
13 or have to do, per mandates. And so the typical way is  
14 through debt financing, but there's various challenges with  
15 traditional debt. Mostly being shorter terms and balloon  
16 payments.

17           So most traditional lenders will end up to 7 or 10  
18 years max. So with this, and maybe they're amortized so the  
19 payments are maybe over a 20- or 30-year timeframe, but come  
20 due in 10 years. So if it comes due in 10 years, we call it a  
21 balloon payment and that either needs to be refinanced or  
22 paid off with cash. So this type of financing can be  
23 unfavorable to expanding the scope of the work or doesn't  
24 allow the overall project to cashflow and so the best thing  
25 that happens is if they don't have to do it, they're not

1 mandated, they don't do it.

2           The other constraints with that financing are  
3 personal guarantees so the borrower has to put up additional  
4 collateral. And they have the ability -- the banks would  
5 have the ability to have recourse, if the property owner  
6 fails to pay. This also reduces that specific borrower's  
7 capacity to borrow more, maybe for their core business or  
8 other needs that aren't necessarily for efficiency or, yeah,  
9 efficiency measures. This also can reduce the net worth of  
10 the building based on the amount of debt that's on it further  
11 constraining the property owner's ability or desire to make  
12 this project happen.

13           So then the next, we all know, cash. Cash can  
14 finance anything as well, but this reduces the property  
15 owner's liquidity and they're available cash on hand for  
16 either, they're either budgeting for other core things in  
17 their business and it's an opportunity cost. So a lot of  
18 these projects, while they do have a good internal rate of  
19 return, they may be not better than something in their core  
20 business. So you are always struggling for project capital  
21 versus, you know, it's better maybe to increase inventory for  
22 their business or hire more staff. And that has a better IRR  
23 than let's say a new roof or new building control system.

24           And so, lastly, really what PACE solves is they don't  
25 really mess with either the debt or the cash. So PACE, once

1 again, PACE financing is where the property is borrowing the  
2 money rather than the property owner. And so the financing  
3 itself is not callable, no covenants, no recourse. This  
4 conserves both the cash and debt for those -- that core  
5 business need or those cash reserves.

6 And so, let's go to the next slide. Let's go into  
7 the really the core benefits of PACE financing. We can  
8 provide up to a hundred percent financing on the project.  
9 This is much different than traditional financing which could  
10 be upwards of maybe 80 percent so the property owner does  
11 have to bring in some additional capital to make the project  
12 happen.

13 We are fairly conservative on loan to values so we  
14 don't, we're not further extending the rate portion of the  
15 value of the property for PACE financing. So we'll go up to  
16 15 or 20 percent, loan to value. We can, however, go up to a  
17 hundred percent combined loan to value. So a quick overview  
18 of that is if a commercial property has a mortgage of let's  
19 say 80 percent loan to value, we could come in with the other  
20 20 percent to make the project happen.

21 We can go up to 30-year terms so a lot of these  
22 eligible improvements have long useful lives. And so the  
23 struggles, like I said, with normal debt financing is the  
24 short of returns. So since we're investing into the property  
25 and that specific improvement with the longer term, we can go

1 up to 30 years. So as long as the project has a useful life  
2 greater than 30 years, we may go up to that. For example,  
3 let's HVAC has a 20-year useful life, we can do a 20-year  
4 term. But if we were going to do a roof, a roof has let's  
5 say a 50-year useful life, we can go up to 30 years.

6 So what's really unique about our PACE financing here  
7 is that it is self-amortized, or fully amortized, so there is  
8 no balloon payments. If we go up to the 30 years, at the end  
9 of the 30 years, it's completely paid off. We don't have any  
10 recourse, so property owner doesn't have to put up additional  
11 collateral or personal guarantees. It doesn't accelerate at  
12 all so if there is a delinquent payment, just whatever is due  
13 is owed. And we can never accelerate the financing. Just  
14 like property taxes, you don't accelerate property taxes, if  
15 they become delinquent. You just have to come current.

16 What we're seeing as a great benefit here is deferred  
17 payments. So how property taxes are billed, there's a fiscal  
18 year from July to June, and so if we do a project let's say  
19 right now in May, we can defer it an additional year, tax  
20 year, and it would show up on the 2021 -- I'm sorry, 2022 tax  
21 bill.

22 As I mentioned, the property is the borrower, not the  
23 property owner. So that means if there happens to be a sale,  
24 it may be able to be transferred to the next property owner.  
25 It also can be passed through to tenants. Most tenants in a

1 triple net situation have the ability or in their agreement  
2 are paying the property taxes. So this can solve the  
3 property owner/tenant catch 22 that a property owner that  
4 wants to make improve -- or sorry, the tenant wants to make  
5 improvements to reduce their energy consumption or their  
6 comfort, but at the expense of the property owner. So the  
7 property owner could elect to have this financing and then  
8 pass through the property tax financing to the tenant.

9 Next slide, please.

10 So just a quick overview. I'd like to put our  
11 Property Assessed Clean Energy products into three  
12 categories. And we've mainly, here at Ygrene, focus on the  
13 middle which is the retrofit. But we do do new construction  
14 so that will be a part of the capital stack so it'll be  
15 construction, financing, and essentially what we're doing is  
16 there's -- PACE can replace some of the higher interest  
17 financing like mezzanine or what we call hard money and  
18 overall reduce the overall cost of the financing for the  
19 property owner. And in doing so, if we can lower the cost,  
20 sometimes this can able higher building standards to be  
21 implemented in the scope. But essentially this is allowing  
22 more projects to get done at a cheaper form of money.

23 Like I said, Ygrene is focused on the retrofit or  
24 rehabilitation of buildings. We have aging building  
25 infrastructure and so we've been focused on the small to

1 medium sized businesses looking to access capital to  
2 accelerate the growth or accelerate these projects and get  
3 these buildings up to current building code or exceed them.  
4 So, like I said, it's a hundred percent. We have the longer  
5 terms. Things get the cashflow. It doesn't have to be in  
6 the budget this year and, you know, what you've seen mostly  
7 is mostly fixing of let's say HVAC, not putting in new  
8 systems that have an overall efficiency and can really have a  
9 net benefit. So our campaign is to replace, don't fix, and  
10 do a comprehensive model. And that comprehensive model could  
11 actually produce a net benefit to the property owner.

12           And then, lastly, what I wanted to say what we solved  
13 for -- or have a solution during this COVID crisis is a  
14 retroactive or recapitalization. So we have the ability to  
15 finance retroactively projects that property owners have done  
16 in California for the last five years, since our program has  
17 been in inception since 2015.

18           So for an example we had a property owner that did a  
19 new roof, HVAC system for say \$500,000 two years ago. Now  
20 they're in a scenario that they need, let's say that was a  
21 hotel, they don't have any liquidity coming in from, you  
22 know, hotel bookings and now they need to pay their mortgage.  
23 And they need all this, they didn't budget for this lack of  
24 liquidity. We can come in relatively quickly and inject  
25 capital into the property and into the property owner so they

1 can maintain their debt service to their mortgage holders.

2 And so we can be a great benefit. They can also  
3 manage cashflow with this capital coming in. They don't have  
4 to make payments for up to two years so they're not going to  
5 be burdened with additional payments every month or every  
6 year. And so we can float them through this crisis and see  
7 the light at the end of the tunnel here while we get back on  
8 our feet. So we've seen a lot in uptick in property owners  
9 looking for this type of product and it's been great to  
10 service these property owners in need during this time.  
11 So I want to thank you all for this opportunity to present  
12 PACE to this workshop. Thank you very much.

13 And my contact information is there if you have any  
14 follow up questions about the program. Thank you.

15 MR. TAYLOR: Thank you very much, Ryan, I really  
16 appreciate it.

17 I'm going to transfer this over to Commission  
18 McAllister for his questions. But real quick, the -- okay,  
19 clearly financing and project costs are top concerns and I'm  
20 really glad to have Ryan here to focus on, you know, the  
21 general concepts and much more broadly than just PACE. But  
22 is there any other financial tools for commercial building  
23 owners that any of the three of you would like to highlight?

24 MS. MAZELLI: You know, it's -- there's not a lot,  
25 that's the problem. You know, SBA has, there's a 504 and 7A

1 loans out there that allow commercial property owners that  
2 are owner-occupied so they own a business within the building  
3 that they own. They have some pretty good financing for  
4 them. But for property owners that have tenants, that's  
5 where you're just dealing with standard, traditional ten-year  
6 loans and so a lot of it is then, yeah, your financing it via  
7 cash. And so that's why I think we have an aging building  
8 infrastructure of well, I don't live in the property or I  
9 don't occupy the property, it's not really in my benefit to  
10 inject a bunch of capital. I own these buildings, they --  
11 just going to react to anything that needs to be fixed rather  
12 than create a healthy building. So financing, like PACE, I  
13 think is pushing property owners that would normally not  
14 necessarily look at it that way. So, yeah, there is a gap.

15 MR. MALOTTE: This is Chris from Southern California  
16 Edison. I will highlight on-bill financing I know was  
17 touched on earlier. On-bill financing is a really good tool  
18 for energy efficiency. The challenge with it is it requires  
19 bill reduction looking at one fuel. And so there may be  
20 opportunities to modify that in the future that really target  
21 kind of comprehensive bill savings that currently we are  
22 thinking through. Or maybe even increasing above the bill,  
23 you know, using it as a tool for actually paying off a loan,  
24 just a normal loan.

25 MR. TAYLOR: Commissioner McAllister, I'll turn it

1 over to you for questions and then we'll have some  
2 opportunity for public questions and then we'll move on I  
3 believe to the full public comment period.

4 COMMISSIONER MCALLISTER: Great. Can you all hear me  
5 okay?

6 MR. TAYLOR: Yes.

7 COMMISSIONER MCALLISTER: Oh, good. Great. I've been  
8 having some audio issues today so hopefully we can work those  
9 out going forward. So thanks very much for your  
10 presentation. I'm excited about all of what you are doing,  
11 certainly a commercial sector is a focus as you know of the  
12 building code update for 2022 and so this is relevant not  
13 totally for the 3232 work, but more broadly. I certainly  
14 appreciate all your collaboration.

15 And excited about the optimization program that  
16 you're doing with the CSUs and UCs just because it does allow  
17 this integration that you're referring to, Chris, so I really  
18 like that and taking a broad view of how we get  
19 decarbonization.

20 I guess I want to leave time for others to ask  
21 questions. My, I guess I would ask all three of you, you  
22 know, we're in the COVID era, there's quite of bit of  
23 discussion about how the way we use buildings, will change.  
24 And our behavior patterns and our work patterns will change.  
25 And there's even talk of a glut on the commercial side or

1 some unused commercial space. So I guess I'm wondering  
2 whether you see or if you're thinking about opportunities for  
3 decarbonization in this transition or as we sort of seek the  
4 new normal in terms of our work lives and how these buildings  
5 actually get built going forward. You know, as their usage  
6 patterns may be changes, are there windows or doors that open  
7 for us.

8 MS. HIGGINS: Well I think I'll chime in first,  
9 Andrew, thank you, Commissioner McAllister. Is my audio  
10 okay?

11 COMMISSIONER MCALLISTER: Yeah.

12 MS. HIGGINS: Oh, okay. This morning, I get the  
13 bi-weekly EU News and they're calling, their terminology --  
14 terminology does matter, you know, it captures the market  
15 centers. They're using the term renovation wave for their  
16 investment post-COVID and I think in California waves will be  
17 pretty popular with your cosign and that term might capture  
18 this.

19 Asset risk is a big concern to the commercial sector  
20 and we've been talking to some of the BOMA chapter leads and  
21 their entire mindset and concerns is about rent and lease  
22 payments, very little about having to do with the building  
23 structure itself. It's whether it's going to be literally  
24 empty or paid for, those risks.

25 So I think that there is opportunity, again, back to

1 what I said earlier about messaging, that this is not, you  
2 know, an energy-driven solution just because that's our  
3 lands. The solution is about returning to an asset that's  
4 more secure, that's attractive, and beneficial to the  
5 occupants, the health aspect, the ventilation strategies, the  
6 resiliency of the physical space. I would expect that we'll  
7 see some pull back on new construction because there's going  
8 to be extra existing buildings that may be vacated or changed  
9 in the modification. So it'll be great price points for  
10 people to reconsider occupying existing buildings. But I'd  
11 just echo the opportunity to make our lands symbiotic with  
12 the lands of commercial owners in terms of risk mitigation.

13 COMMISSIONER MCALLISTER: So maybe there's a theme  
14 there that is, okay, if we believe that there's a wave of  
15 renovation coming, how do we get our ducks in a row to really  
16 have an impact on it, have our finger on the pulse of it and  
17 get involved early on in each project.

18 MS. HIGGINS: Yeah, or what kind of building do you  
19 want to have in the future instead of what building do you  
20 have that's a baggage to you right now.

21 COMMISSIONER MCALLISTER: Right.

22 MS. HIGGINS: And combined with a great finance  
23 options. I can't believe what I just heard from Ryan that he  
24 can go backwards several years. What a fabulous opportunity  
25 for buildings to get some funds for items that they need to

1 do.

2 MR. MALOTTE: This is Chris Malotte from SCE.  
3 Commissioner McAllister, I'm kind of -- I've got a couple of  
4 thoughts on this particular question. So, one, I think is  
5 COVID has really shown us that by taking action, we can  
6 actually have really strong impacts on the environment. And  
7 so I think it's a lot more visible to people just how much  
8 what we do impacts the environment. And so I just want to  
9 throw that out there for thoughts because I think people are  
10 a lot more likely to believe that what we adopt in the future  
11 will actually benefit the environment because they are seeing  
12 it with their own eyes right now.

13 Second piece is, I think there's going to need to be  
14 a large amount of stimulus money going towards kind of the  
15 reopening of the economy, however you want to call it, as we  
16 get things back up to normal. And there is a lot of benefit  
17 to marketing our building decarbonization measures as kind of  
18 shovel ready, so to speak, so that it's technology that's  
19 there that if properly stimulated can actually move a market  
20 forward. And, you know, I'm thinking back to the last  
21 recession with really AMI and a lot of the solar stuff that  
22 was out there. That stimulus money has paid dividends many  
23 times over and that it's now become a market adopted. And so  
24 I think we need to take a similar approach on the building  
25 decarb side and say this is a really good opportunity for us

1 to really move these technologies from somewhat infancy to  
2 mature marketed option.

3 COMMISSIONER MCALLISTER: Great. I'll second that.  
4 Your CEO is on the Governor's Task Force so please let him  
5 know how good this is.  
6 Great. Well, I think, unless Ryan you want to chime in, I  
7 think I will open it up for questions so we can make sure we  
8 get to everybody as possible.

9 MR. MAZELLI: Yeah, I'm good, yeah.

10 COMMISSIONER MCALLISTER: Great, thanks, Ryan.  
11 All right, I'll pass it back to Gabe and he can manage the  
12 public comment.

13 MR. TAYLOR: Yes. Turn it over to the Public  
14 Advisor's office and the host, PAO office, to read off any  
15 questions for this panel. And then after we have a couple of  
16 questions for this panel, maybe we can formally transition to  
17 the general question period.

18 MR. SAMUELSON: Okay, this is Brian. I have, yeah,  
19 there's a couple of questions for this panel. One  
20 specifically for Ygrene from Roger Davenport. Question is  
21 PACE rates seem high to me, particularly for solar, which has  
22 basically zero risk. Please comment.

23 MR. MAZELLI: Sure. So rate is just one of the piece  
24 of the puzzle. So when comparing rate, there's more to  
25 consider with either fees and then mainly the true cost of

1 the funds over the term. So while PACE won't be the cheapest  
2 form of capital, it has the longest amortization possible.  
3 So it achieves a more, it achieves I would say cashflow  
4 scenarios, in some case for solar, it can be cashflow  
5 positive.

6 So if you have a term of 30 years, the payments are  
7 going to be significantly lower than a 10-year term. So  
8 maybe the payment on the 10 year, while that interest rate is  
9 higher -- sorry, that interest rate is lower maybe from the  
10 bank, the payment is greater than the energy savings from the  
11 solar system. Now PACE may be a higher interest rate, but  
12 the payment is over 30 years which is lower than the energy  
13 savings so you have a net cashflow benefit from day one. So  
14 it solves the issue of I want to do this project and I don't  
15 want to pay any money out of pocket, and I want to be let's  
16 say cashflow neutral or positive. That won't be the case  
17 with a traditional bank loan. If a customer is looking for  
18 the cheapest form of capital, then going to an institutional  
19 bank is your best bet. So we're supplementary. We're not  
20 the only solution. So it's all -- it's a cashflow play.

21 MR. SAMUELSON: Okay, thank you. The next question  
22 is from Jan Dietrich. This is for all the panelists. An  
23 important source for financing for DERs that support  
24 commercial solar plus storage building projects is currently  
25 going to the IOUs in transmission access charges. Fixing TAC

1 can redirect over 60 million over the next 20 years. Why  
2 isn't TAC's reform part of the discussion for fuel switching?

3 MR. MALOTTE: So I think that's probably directed  
4 closer to me at SCE. And I'll say I am by no means the  
5 expert on transmission access charges, but, Jan, I'm happy to  
6 get you in touch with the right people so we can talk about  
7 that further.

8 MR. SAMUELSON: Okay. We'll move on to a question  
9 from John Norwood. It's a general question. If part of the  
10 preceding are to help achieve more improved energy efficiency  
11 and housing affordability, how can that be squared with the  
12 much higher cost of electricity versus the cost of gas?

13 MS. HIGGINS: I can address that because what you're  
14 really referring to in terms of fuel prices, if you look at a  
15 model of analysis of comparative gas technologies versus  
16 electric, which is the point before us.

17 Previously, for example, a gas water heater was  
18 definitely the most economical system to operate. But when  
19 you've got a heat pump water heater that performs at 3 to 4x  
20 the efficiency, the actual cost of operating that system is  
21 the same for air source heat pumps. So it isn't a matter of  
22 the fuel cost singularly, it's you put the unit in and how  
23 many units to get out for your bills. So operating costs of  
24 the technologies that are being promoted are lower than the  
25 operating costs of the incumbent technologies in order to

1 make them competitive. The real barrier lies in the  
2 difference in the capital cost install them.

3 MR. MAZELLI: Yeah, I was going to add just like the  
4 said levelized cost of the unit over time versus upfront.  
5 Yes, some of the incumbent technology can be cheaper to  
6 install but sometimes over that useful life of a more  
7 efficient or newer technology could be lower.

8 MR. MALOTTE: Yeah, I'd second on that. I think  
9 there's a lot of, it's very much situation dependent as well.  
10 There's a lot of different studies that have different  
11 numbers. So you saw some earlier in the day about  
12 residential situations where it's substantially cheaper to  
13 switch to heat pump water heaters, but again it really  
14 depends on how much of the house needs to be retrofitted to  
15 accommodate that and that sort of thing. So what we have  
16 seen is that there's bill savings to be found in the  
17 residential space. Less so on the commercial space but  
18 there's still some benefits depending on the particular  
19 technology.

20 MR. SAMUELSON: Great. That was all of the questions  
21 that I had from the chat.

22 MS. MURIMI: Thank you, Brian. This is Dorothy  
23 Murimi with the Public Advisor's office. We can move on to  
24 public comment. And so if folks on the line could use the  
25 raise hand feature. If you click the participant button, go

1 all the way to the bottom, there's a raise hand button, click  
2 that, and that'll notify us that you have a question.

3 We do have one from a call-in user that emailed the  
4 Public Advisor's office. That is also another option you can  
5 use. Email the Public Advisor's office at  
6 [publicadvisor@energy.ca.gov](mailto:publicadvisor@energy.ca.gov). If you're on the phone line,  
7 I'll be able to unmute you.

8 So let's go through call-in users first since I see  
9 no hands raised at the moment. We'll start with call-in user  
10 28. Brian, if you can go ahead.

11 MR. SAMUELSON: They are unmuted.

12 MS. MURIMI: Call-in user 28, do you have any  
13 comments? No. All right. We can try call-in user 42.

14 MR. SAMUELSON: Call-in user 42 is unmuted.

15 MS. MURIMI: Is that Lauren Cullum? No response and  
16 no hand raised. I'll hand this over -- I'll hand this back  
17 to Jennifer. Again, if anyone has any public comments,  
18 please raise your hand. Also --

19 MR. SAMUELSON: Dorothy, this is Brian. I do -- I  
20 have gotten one on from the chat that John Norwood --

21 MS. CULLUM: There you go, Lauren.

22 MR. SAMUELSON: -- would like to comment. So let me  
23 unmute John.

24 John, I unmuted you.

25 MR. NORWOOD: Hello. Thank you. My name is John

1 Norwood and I'm representing today the California Pool and  
2 Spa Association and I realize that a very narrow interest in  
3 all this. I've actually enjoyed this whole webinar, and  
4 hopefully I've learned a little bit.

5 But, yeah, we are an association of swimming pool  
6 builders, but also the service industry, the manufacturers,  
7 subcontractors, distributors, and things like that. Our  
8 interest today may seem narrow but in a 2014 study, there was  
9 indicated that pool and spa industry has a \$5 billion effect  
10 on California and that didn't include remodeling. It also  
11 doesn't include the multiplier factor of backyard furniture,  
12 barbecues, you know, a number of kinds of pool toys, things  
13 like that. And also it's the industry that is local in  
14 nature. We have obviously builders all over the -- in almost  
15 every city and county. They buy all their materials locally.  
16 So they really are participant in the economic activity of  
17 the state.

18 Our association supports a balanced energy portfolio  
19 and that includes natural gas and it's in part because of  
20 what we build. We've worked with the Energy Commission  
21 through our members on trying to reduce energy use and with  
22 LED lighting and variable speed pumps. And, you know, pool  
23 heaters that we have less friction and use less energy. But  
24 we're concerned about going in this direction because it  
25 seems to us that eliminating the use of natural gas in

1 California are providing incentives for homebuilders to  
2 construct new housing tracks without natural gas lines or  
3 hook ups, or otherwise phasing out natural gas, kind of  
4 undermines our industry. Deprives Californians of choice and  
5 at least in my opinion it kind of a regressive tax.

6 Just to be clear, our members don't just build  
7 swimming pools and spas. They build environments for  
8 families that, you know, to enjoy their backyards. And we're  
9 seeing with COVID-19 that people, you know, want to do that.  
10 Even before COVID-19, since 2014 we've come out of the  
11 economic depression, every single year has been a record year  
12 for pool building in the state. But, you know, we're  
13 building outdoor kitchens, barbecue islands, fire pits,  
14 fireplaces, pizza ovens. You know, things like that, in  
15 addition because people want to enjoy their homes and use  
16 those. And that's just on the residential side, a whole  
17 different deal on the commercial side.

18 But we don't see right now to the extent that we can  
19 use alternative energy sources, you know, that's one pull.  
20 Certainly solar and to some extent heat pumps play a role in  
21 that, but they don't play a role in a heater that heats a spa  
22 for somebody that wants to take a spa at 9:00 or 10:00 at  
23 night. They don't replace barbecues where people want to  
24 barbecue outside. They don't replace fire pits when people  
25 want to do s'mores on their fire pits. And that may, you

1 know, seem very small stuff to, you know, this larger goal of  
2 reducing greenhouse gases, but it's obviously critical to our  
3 side of this thing.

4           On the commercial side, if you include swimming  
5 pools, and schools, and colleges, and universities, and swim  
6 clubs, and things like that, the practicality of using  
7 anything but gas to heat those pools is just not there. To  
8 use heat pumps and solar, you would need equipment pads the  
9 size of a basketball court. Even in home applications to be  
10 able to have something that would be equivalent to a gas  
11 heater, you need these big equipment pads and what we're  
12 seeing in commercial, or excuse me, in residential  
13 construction is smaller and smaller building platforms for  
14 homes to the point where you're talking about you're lucky to  
15 have five foot --

16           MS. MURIMI: Sir.

17           MR. NORWOOD: -- side yards.

18           MS. MURIMI: Mr. Norwood.

19           MR. NORWOOD: Yes.

20           MS. MURIMI: Your time is almost up. Do you have any  
21 other closing comments?

22           MR. NORWOOD: No. I just like to say that, you know,  
23 I think you had somebody from, I think it was Gridworks,  
24 prior that tried to pull things together and industries  
25 together to have conversations about, you know, how we could

1 go forward together and maybe we're a candidate for that.  
2 But we are interested and would like to continue to be a  
3 participant in these kinds of proceedings and to see how we  
4 can keep this industry alive. Thank you.

5 MS. MURIMI: Thank you. Next we have -- oh, do we  
6 have anyone else? Brian, I see we have one call-in in  
7 George Nesbitt, with their hands raised.

8 MR. SAMUELSON: Yes, I'm going to unmute Lauren  
9 Cullum right now.

10 MS. CULLUM: Thanks. Hi, can you hear me?

11 MR. SAMUELSON: Yes.

12 MS. CULLUM: Hello? Oh, yes?

13 MR. SAMUELSON: Yes, we can hear you.

14 MS. CULLUM: Okay, wonderful. Hi, Lauren Cullum,  
15 Policy Advocate with Sierra Club California representing 13  
16 local chapters in California and a half a million members in  
17 supporters across the state. Thank you so much for hosting  
18 this webinar today on the AB 3232 Building Decarbonization  
19 Assessment.

20 You know, considering our current circumstances due  
21 to COVID-19, regulatory rollbacks, budget cuts, it is that  
22 much more essential that the building decarbonization  
23 assessment emphasizes the importance of transmission to 100  
24 percent electrification. Sufficient electrification will  
25 ultimately bring methane and carbon dioxide emissions from

1 buildings to zero as the grid becomes cleaner, eliminate the  
2 health impact from burning gas indoors and do away with the  
3 safety risks from gas leaks and explosions all while  
4 capitalizing on a declining cost of generating electricity  
5 from solar and wind power.

6           And in my comments today, I'd like to just quickly or  
7 briefly address the role of biomethane and synthetic gas to  
8 decarbonized buildings. The gas industry often pitches these  
9 resources as an alternative for building electrification, but  
10 it will not be possible to achieve the decarbonization we  
11 need using methane fuels for at least four reasons.

12           First, there isn't a sufficient supply. The gas  
13 industry's own research found biomethane can only replace 13  
14 percent of the existing demand for possible gas after two  
15 decades of ramping up supply and production. Any strides  
16 used to reduce those emissions that relies on biomethane  
17 would not lead to full or even substantial decarbonization.

18           Second, swapping fossil gas from biomethane is  
19 astronomically expensive. Production costs can be 8 to 17  
20 times more expensive than fossil gas.

21           Third, biomethane can have serious environmental  
22 impacts. Facilities where biomethane is produced by confined  
23 animal feeding operations can exacerbate air and water  
24 pollution impact in nearby communities. And biomethane still  
25 produces carbon dioxide solution from combustion and methane

1 leakage throughout the distribution process.

2           Finally, biomethane is no cleaner than fossil gas and  
3 burning it in our homes and buildings can cause the same  
4 problems inherent in any combustion-based fuels. They  
5 produce (indiscernible), carbon oxide and other pollutants  
6 that harm our health and also contribute to local air  
7 pollution.

8           By contrast, UCLA researchers have found that  
9 replacing residential gas appliances with zero emission  
10 electrical alternatives in California will result annually in  
11 at least 350 fewer deaths and produce at least \$3.5 billion  
12 in health benefits. I'd also like to note that gas is not  
13 necessarily more reliable in the event of a power outage as  
14 many gas appliances like (indiscernible), ovens, and tankless  
15 gas water heaters also require electricity to operate.

16           And finally, it is important to remember that  
17 building electrification will also require a skilled and  
18 trained workforce. As recent studies have shown that  
19 electrifying 100 percent of California's existing and new  
20 buildings by 2045 would create over 100,000 full-time  
21 equivalent jobs in various sectors of the economy. That  
22 figure represents a net increase in jobs even after  
23 accounting for losses in the fossil industry. And 3 out of 5 of  
24 these new jobs will be inspectors that require and  
25 appropriately compensate the skilled and trained workforce.

1 By prioritizing our (indiscernible) homes and buildings, it  
2 can help achieve the climate, safety, affordable housing and  
3 economical (indiscernible) methane gas dependency. Thank you  
4 so much.

5 MS. MURIMI: Thank you, Lauren. And just a note  
6 before we move on to George Nesbitt, we do have Panama  
7 Bartholomy from the Building Decarb Coalition and Meghan  
8 Dewey from PG&E. They are available to answer questions if  
9 anyone wants to raise hands and ask a question.

10 Next we have George Nesbitt.

11 MR. NESBITT: Can you hear me?

12 MR. SAMUELSON: Yes, we can hear you, George.

13 MR. NESBITT: Yes, George Nesbitt, HERS Rater.

14 The main point I'd like to make is that  
15 electrification is only a part of decarbonization. So I've  
16 been professionally involved in construction. I've done  
17 everything from digging a hole in the ground up through the  
18 roof and pretty much everything in between. I've done, you  
19 know, remodeling, retrofit, repair, addition, a little bit of  
20 new construction. You know, impersonated architecture and  
21 engineer skill. So I've got a lot of different experience  
22 and energy efficiency environment are our core values I grew  
23 up with.

24 I think my experience, our experience for many of us  
25 for decades has been the difference between -- there's a big

1 difference between building that use less energy to do what  
2 they need to do and those that use more, has to do with  
3 design, construction, commissioning. And I think in a lot of  
4 ways we still play a fair amount of lip service to the amount  
5 of potential for energy conservation and efficiency building  
6 buildings that need very little energy. That the energy they  
7 do use, they use efficiently through, you know, efficient  
8 water distribution or air distribution system. That's before  
9 you even get to the efficiency of the equipment of the  
10 heating, the cooling system, the water heating system, the  
11 lighting system or the fuel of those systems.

12           And so, I think for electrification to make sense  
13 considering we're talking about electrifying buildings, the  
14 transportation system, industry, everything, is that if we do  
15 not drastically reduce the amount of energy we already  
16 consume, it's going to be a lot harder to electrify  
17 everything and we can't just assume that renewable energy is  
18 going to be cheaper, or battery use, and nuclear power was  
19 supposed to be so cheap they wouldn't have to meter it. And  
20 we know how expensive that is. So we really have to pay  
21 attention.

22           And, you know, there are so many decisions that are  
23 made, that are made poorly or without thought that basically  
24 make it more expensive to go back, do it right. Or to allow  
25 you to inflate or do something in the future. And if we don't

1 have a whole industry that recognizes opportunities when they  
2 go to replace a water heater, to make an improvement, we'll  
3 never get there. So that's all I really have to say.

4 Thanks.

5 MS. MURIMI: Thank you, George. Is there anyone else  
6 with questions? You can raise your hand. I see Jan  
7 Dietrich.

8 MS. DIETRICK: Can you hear me?

9 MR. SAMUELSON: You're unmuted, Jan.

10 MS. DIETRICK: Thank you. Yeah, so I'm Policy Team  
11 Leader for the Ventura County 350 Climate HUB. So we've  
12 been, had a campaign to all the cities in West Ventura County  
13 for building decarb and one of the barriers that we find is  
14 the immense influence of Southern California gas on our city  
15 councils and our city officials.

16 I've been to city council meetings where the SoCal  
17 Gas representative has her three-minute pitch, it's opening  
18 of meetings, making sure the public and the city council  
19 members all know that they have a right to continue to enjoy  
20 cooking with gas. And as the Sierra Club person said that  
21 this could be clean gas, right? And so I want thoroughly, we  
22 thoroughly endorse the comments from the Sierra Club  
23 California about getting all gas out of homes and wonder how  
24 it can be that SoCal Gas can be allowed to do the kind the  
25 disinformation that it's doing in our cities with the amazing

1 blackmail that the friends of SoCal Gas did to the San Luis  
2 Obispo city council deterring them from approving their reach  
3 code in their second reading. This kind of pressure and  
4 influence from the gas company has really got to stop. Thank  
5 you.

6 MS. MURIMI: Thank you, Jan. We have Pierre  
7 Delforge. Forgive me if I'm saying your name wrong. Pierre  
8 Delforge, from NRDC, on the line.

9 MR. DELFORGE: Thank you. You said it very well. So  
10 I want to thank you, thank the Commissioner and Commission  
11 staff for holding this great workshop and all the presenters  
12 for these really insightful presentations today. And I'm  
13 speaking on behalf of NRDC.

14 So I'll be starting to say it's critical to  
15 understand how we can decarbonize our building stock at the  
16 pace and skill needed through the pandemic crisis. And as  
17 Commissioner McAllister rightly pointed out, the challenge  
18 how to scale this decarbonization cost-effectively,  
19 particularly in low-income communities who can least afford  
20 the capital cost of this transition.

21 As we made the case in our previous written comments  
22 and we'll continue to develop in our next comments, we need a  
23 moonshot strategy to develop the market for clean heat and  
24 cooking technology to bringing down the cost curves so that  
25 it becomes affordable to retrofit the entire building stock

1 in California for energy efficiency and electrification  
2 together. California has done it before with the help of  
3 others with rooftop solar as, you know, Panama Bartholomy  
4 showed in his presentation, with appliance efficiency  
5 standards, LEDs, we're currently doing with electric  
6 vehicles. So we encourage the Commission to propose a clear  
7 road map for California.

8 As proposed with the -- by the Building Decarb  
9 Coalition, to address this new moonshot and to show the rest  
10 of the world how we can move to an equitable and just  
11 building decarbonization in line with our common goals.  
12 Thank you.

13 MS. MURIMI: Thank you, Pierre. Next we have Charles  
14 Cormany. Charles Cormany.

15 MR. CORMANY: Hello? Can you hear me?

16 MS. MURIMI: Hi, we can hear you.

17 MR. SAMUELSON: Yes.

18 MR. CORMANY: Okay. This is Charles Cormany. I'm  
19 calling from, I'm representing (indiscernible) California.

20 I've heard some interesting conversations today and  
21 one thing I want to point out in all of this being a trade  
22 organization that represents contractors is there's going to  
23 be no scale to this effort if we don't fund and put a  
24 concerted effort into contractor education training to bring  
25 them into the workforce. We have to put, you know, the solid

1 value proposition was presented earlier. I think contractors  
2 being profitable is key. If we want people to support this  
3 industry, we have to get them out of their existing modes of  
4 just going in and quickly replacing equipment and thinking a  
5 little further down the road and putting in the right  
6 solution instead of just the quickest and most profitable.

7 That said, if you can make the most profitable  
8 solution the correct solution, i.e. heat pumps, that would be  
9 a good step in the right direction. So I think we need to  
10 really fund and support contractor education and training.

11 And I also want to state that it's also hard for  
12 consumers to find people who are supporting this work. I get  
13 calls regularly from -- hey, do you know somebody in this  
14 region or that region who can help me with my electrification  
15 project. So we have people who are going down the path  
16 towards electrification or early adopters and there's really  
17 no easy way or solid way for them to find a contractor who  
18 can do the work.

19 So efficiently just currently involved in kind of  
20 spearheading an initial development on a contractor directory  
21 statewide, and we're doing that at on our expense because we  
22 feel that it's such an important issue. So I think we really  
23 need to get behind making some way for the consumer to be  
24 able to find the people to do the work and encouraging --  
25 holding contractors to get on board on some kind of a form

1 and have a statewide tool for people to be able to find the  
2 right people to do the work. I think that's critical to  
3 getting scale. That's it, thank you.

4 MS. MURIMI: Thank you, Charles.

5 At this time, I see no other hand raised. If you  
6 have a question or a comment, please utilize the raise hand  
7 feature. I see, okay, I see Tom Conlon. Tom Conlon.

8 MR. CONLON: Hi, can you hear me?

9 MS. MURIMI: Yes, we can.

10 MR. CONLON: Great. I was just reflecting -- I would  
11 also, I first would echo what Charlie Cormany just said.  
12 Obviously we need to make it viable for contractors, for  
13 customers to find contractors and contractors to make a  
14 profit when they do a job.

15 But I wanted to go back to something that the  
16 representative from PG&E, Meghan Dewey, said this morning  
17 about homework for us to address the customer barriers around  
18 perceptions that gas cooking and gas fireplaces are still  
19 desirable in a home. And we have, it feels like the AB 32  
20 efforts -- 3232 efforts are happening in a silo right now,  
21 that they're not well integrated with the rest of the  
22 portfolio of marketing education outreach activities. In  
23 particular, the Energy Upgrade California program.

24 So my question to the panel is, when do we really see  
25 this electrification effort becoming central to the rest of

1 the marketing education and outreach programs, especially in  
2 the residential sector.

3 MS. MURIMI: Thank you, Tom. At this time, this is  
4 Dorothy again. At this time, I see no other hands raised.  
5 Oh, we have one more. Becky Menton. Becky Menton.

6 MS. BENTON: Hi, this is Becky. Can you hear me  
7 okay?

8 MS. MURIMI: Yes, we can. Go ahead, Becky.

9 MS. BENTON: Thank you. So I personally learned  
10 firsthand barriers associated with electric service upgrade  
11 when my water heater failed and I tried to get it replaced  
12 with an electric water heater. And the timeframe and cost  
13 both increased significantly when the service panel question  
14 came into play.

15 Given that we know we need to electrify significantly  
16 our building stock in order to meet our climate goals, but  
17 that estimates range from 30 to 50 percent of single-family  
18 homes will need to have service panels adjusted, I'm curious  
19 what is being done both in terms of programmatically trying  
20 to think through how we can address that problem to enable  
21 the scale of electrification we need to see, but also from a  
22 regulatory standpoint, it's fair that utilities need to have  
23 their cost covered. But some comparisons show pretty broad  
24 variation amongst utilities with costs being 3 to 4 times  
25 higher in some utility service areas. So I wonder what's

1 being done or considered a solution to this issue. Thank  
2 you.

3 MS. MURIMI: Thank you. Pardon me. Thank you,  
4 Becky. Do we have any other questions? Please use the raise  
5 hand feature for questions or comments.

6 One more time. Any questions, please utilize the  
7 raise hand feature. And also you can email the Public  
8 Advisor if you're on the line and we will unmute your phone  
9 line. Any questions or comments?

10 Oh, we have Katie Wu, one of our panelists, Katie Wu,  
11 can speak to Becky's question. Katie, go ahead.

12 MS. WU: Thanks, Dorothy. And thanks, Becky, for the  
13 question.

14 I do think this issue of panel impacts and who pays  
15 for panel upgrades is huge. You know, to your point, if 30  
16 to 50 percent of single-family homes are going to need a  
17 panel upgrade, then, you know, significant funding needs to  
18 be available for that. But some solutions might include  
19 Amperage Technologies that would require less capacity on the  
20 panel and encouraging manufacturing of those technologies.

21 And then to me, I also think that there is this issue  
22 of adequate quality of electric service. And if electric  
23 panels are not sized adequately to meet the service that  
24 customers want, then I think the state, along with utilities  
25 and stakeholders, need to think about what it means to have

1 access to electricity. How do we improve access to  
2 electricity so that customers have adequate service? And for  
3 the state then to consider whether it is within its budget or  
4 within the Clean Energy stimulus to fund panel upgrades for,  
5 you know, the oldest buildings that may not have ever had  
6 their panels upgraded. So I do think that there is  
7 opportunity to think through creative solutions, but no one  
8 agency can do this on their own. I think it will take a  
9 coalition of people to think it through.

10 MS. MURIMI: Thank you. Do we have any other  
11 questions? Seeing no one, I will cede the floor to Jennifer.

12 MS. NELSON: Thank you, Dorothy.

13 MR. ROSALES: Jennifer, this is Eddie. Can you hear  
14 me?

15 MS. NELSON: Yes. Yes, I can.

16 MR. ROSALES: I'm sorry to interject, real quick.  
17 I'm just going to give Leah Pertl an opportunity. I think  
18 she wanted to chime in and also share one last point on that  
19 last question. Sorry about that.

20 Leah, if you can hear me, you're unmuted. You can go  
21 ahead and make your remarks. Okay, maybe Leah's unmuted.  
22 Okay, Jennifer, back to you.

23 MS. NELSON: Okay, great. I want to thank everyone  
24 today for making this a wonderful workshop. I want to send a  
25 thank you to the attendees, the panelists, our moderators,

1 Commissioner McAllister. I want to send a special thank you  
2 to Dorothy Murimi and Brian Samuelson for facilitating the  
3 public comment today. Written comments by June 8<sup>th</sup>, 2020 by 5  
4 p.m. Information on how to submit the comments is provided  
5 in the notice. Below on the slide you will see I have listed  
6 staff contacts with emails. If you have any questions or  
7 comments, please don't hesitate to reach out to any of them.

8           With that, I'm going to send the microphone over to  
9 Commissioner McAllister for some final remarks and then  
10 adjourn.

11           COMMISSIONER MCALLISTER: Oh, great. Okay, so I  
12 think I'm back on here for everybody. Can you hear me all  
13 right?

14           MS. NELSON: Yes.

15           COMMISSIONER MCALLISTER: Okay, great. Yes, I just  
16 wanted to repeat the thanks for everyone. Really I think that  
17 we have a stalwart group of a little over a hundred that  
18 stuck with us the whole day and I think we topped off at over  
19 200. And recognize a lot of the names as real innovators in  
20 this space. So really hopeful that all of you and your  
21 colleagues that weren't able to make it can chime in with  
22 comments and also just keep your thinking caps on as we move  
23 forward with this report.

24           I really -- I want to emphasize just a couple of high  
25 level points that I heard today and I think deserve a lot

1 more discussion. You know, one is how do we keep contractors  
2 front and center as one of the absolutely critical links in  
3 this chain, the link between the customer and the product  
4 supply chain. And get quality installs at a value to the  
5 customer and have the contractor still be able to make money.  
6 That have that just a necessary precondition for any  
7 definition of success. So how does that work? And I  
8 certainly, you know, the time sensitive nature of water  
9 heater replacements, all that, I mean, it's just we have to  
10 figure that out. And that is a community effort. That's  
11 nothing that we can poke and prod at with regulation, but  
12 really it's a market solution, it has to emerge with real  
13 value behind it. And so that's going to take a real  
14 collective effort. So I'm hopeful we can describe that with  
15 some specificity and credibility and robustness in this  
16 report. And just getting in the workflow, you know, helping  
17 that workflow happen in a way that actually can scale,  
18 focusing on the customer.

19           So there was some interesting conversation about  
20 including about panels and other issues that just came up  
21 here at the end about how we can use creative approaches to  
22 get financing for those upgrades that don't necessarily sit  
23 entirely with rate payers and that don't require massive  
24 amounts of subsidies from the general fund or state coffers  
25 that actually do dip into existing capital flows. So I

1 think, again, those are solutions that we've just got to  
2 flesh out. The tariff non-bill is really a solid one that we  
3 can try to engage on and describe in more detail and make a  
4 real solid proposal.

5 I also want to just acknowledge that a lot of these  
6 conversations we are having at the Energy Commission in  
7 consultation with our colleagues over at the Public Utilities  
8 Commission. I mean, the Energy Upgrade California program is  
9 over there. There was a question about that. And they are  
10 in the process of thinking about how they frame and structure  
11 their efficiency portfolio going forward that they ask  
12 utilities to administer working with lots of third parties.  
13 So that's an important piece of this discussion. More  
14 broadly, we have contractors and energy performance  
15 contracting particularly in the commercial and public sector  
16 where there are large capital flows happening outside of any  
17 program that we really need to help shape.

18 So trying to tie together some of the big themes and  
19 some of the sticking points that are going to get in the way  
20 of success and try to find solutions to those. So I know  
21 staff is really rolling their sleeves up ever higher here to  
22 crank out this report and a good draft and keep the  
23 discussion going with all of you to help that happen  
24 expeditiously.

25 So with that I think I'll again just thank staff for

1 all of the organization and, you know, managing the  
2 moderators and Public Advisor for managing the flow of  
3 comments and participation throughout the course of the day.  
4 I've really enjoyed it and I hope everybody else has too.  
5 It's just the start, one step in a bit of a journey here to  
6 really do what I think where the state, where the legislature  
7 have asked us to write a robust plan for something that's  
8 incredibly fundamental to the state to meet its common goals.  
9 So we take it seriously and I think really we're going to  
10 have the most success when we get the best engagement from  
11 all of you and stakeholders. So thanks again for being with  
12 us for the day.

13 Pass it back to you, Jennifer.

14 MS. NELSON: Great. Thank you, Commissioner.

15 Dorothy sent me a note saying we have one more public  
16 comment so I'm going to allow that to happen before we  
17 adjourn. So, Dorothy, I will send the microphone back over  
18 to you.

19 MS. MURIMI: Thank you, Jennifer. We have one last  
20 public comment from Kristen Kessle -- Kessler, sorry. This  
21 is emailed in to Public Advisor.

22 It states: I urge the Commission to say about  
23 natural gas and California by 2030. California has some of  
24 the worst air pollution in the nation. Emissions from gas  
25 appliances is a major contributor to this. Electrification

1 of home and building is not only the most effective way to  
2 reduce methane emissions, but doing so will create hundreds  
3 of thousands of new jobs. Thank you. Kristen Kessler.

4 Thank you, Jennifer.

5 MS. NELSON: Great. Thank you, Dorothy. Thank you,  
6 for everyone. Putting the sign off now. Have a good  
7 weekend. Happy Memorial Day.

8 (Thereupon, the Hearing was adjourned at 3:01 p.m.)

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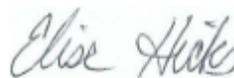
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## CERTIFICATE OF REPORTER

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

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

IN WITNESS WHEREOF, I have hereunto set my hand this 17th day of June, 2020.



ELISE HICKS, IAPRT CERT\*\*2176

## CERTIFICATE OF TRANSCRIBER

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

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

I certify that the foregoing is a correct transcript, to the best of my ability, from the electronic sound recording of the proceedings in the above-entitled matter.



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MARTHA L. NELSON, CERT\*\*367

June 17, 2020